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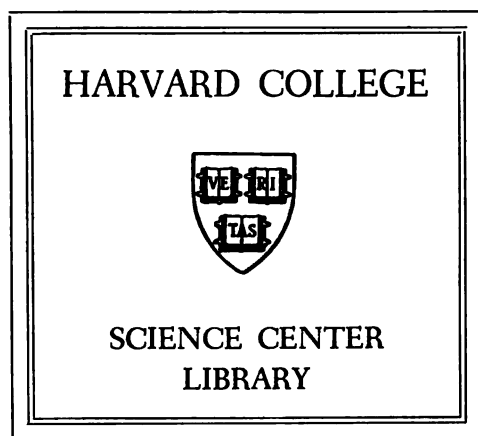
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International Motor Cyclopaedia

SPORT, INDUSTRY and TRADE

Automobiles, Motorcycles, Motorboats and Aeronautics

YEAR BOOK—MARCH, 1908 TO MARCH, 1909

Published by

E. E. SCHWARZKOPF,

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YEAR BOOK

1908

A CYCLOPAEDIA giving the modern signification (illustrated by cuts) of technical terms and expressions used in connection with Automobiles, Motorcycles, Motor boats and Aeronautics.

A SPORT AND TRADE DIRECTORY

Arranged alphabetically
by trade, and
geographically

giving the names and addresses of all makers, dealers, American and Foreign, with short biographical sketches of contemporary notables in Motordom, including patrons of the new arts, writers and authors.

A COMPILATION OF

Calendar of Automobile events
Club members
Laws of United States and foreign countries
Touring information and customs regulations
Competitions, American
Competitions, Foreign
Tables of all 1908 cars
Body styles
Tables of horse power.

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INTRODUCTORY

TO THE

INTERNATIONAL MOTOR CYCLOPAEDIA—YEAR BOOK 1908

In this work it is aimed to furnish, in complete form, conveniently arranged and classified, information for the motorist, whether such information relates to the motor itself or to its application, directly or indirectly, to automobiles, boats and aerial vehicles. Every phase and ramification of the subject has been covered, and these pages are believed to constitute a *vade mecum* of this latest and most important art—a handy reference work which may be consulted at all times.

Ten years ago the motor vehicle was still in the experimental stage. To-day it is a transportation necessity, utilized by a vast and steadily increasing number of people and destined to revolutionize existing systems on the land and water and in the air. Hundreds of millions of dollars of capital are invested and hundreds of thousand of people employed in the new art, and the industry has become one of the greatest in the world.

The use of automobiles and motor cycles has accelerated movement on the highways, shortened the distance between the cities and towns and the suburbs and country districts, and is bringing about a complete change in the laws regulating public traffic. In a thousand ways the motor has thrust itself into the social structure and become an inseparable part of every day life. It has enriched the language by the coinage of new terms and by new applications and extension of meanings of existing terms.

Notwithstanding all this the literature of the subject is compressed in the compass of less than a score of volumes; and these volumes are either highly specialized and devoted to one or two phases of the subject or of such a general character that for reference purposes they are of little value.

It is to the utter lack of any single, comprehensive work of reference that the appearance of the INTERNATIONAL MOTOR CYCLOPAEDIA is due.

The want existed. It was felt by the manufacturer, the jobber, the retailer, the garage keeper and by all the thousands of persons engaged or interested in the trade; by the student of the subject, such as the engineer, the designer and the inventor; by the owner or the user of the motor vehicle; by the pressman; and by the legislator and the lawyer. Each has need of it at one time or another. Heretofore the only recourse has been to motoring books, frequently scattered and difficult of access, treating of the subject in a desultory, fragmentary or haphazard way.

To bring all the available information between two covers, to classify and arrange it so that any inquiry could be answered, any topic turned to, without hesitation or delay—this was believed to be the existing need. How well it has been filled these pages will show.

E. E. SCHWARZKOPF, Publisher.

EXPLANATORY

This Year Book—the INTERNATIONAL MOTOR CYCLOPAEDIA, contains:

The modern significance (illustrated by cuts) of technical terms and expressions used in connection with Automobiles (Motor Cars), Motor Boats and Aeronautics.

A Directory—giving the names of everybody connected with the trade, classified

- a—alphabetically.
- b—by trades.
- c—geographically.

Biographical sketches of contemporary notables in Motordom—engineers, designers, makers, inventors, record holders, editors and patrons of the new arts—that is users.

Calendar of Automobile Events.

Club Members.

Laws of United States and Foreign Countries.

Touring Information and Customs Regulations.

Competitions, American.

Competitions, Foreign.

Tables of all 1908 Cars.

Body Styles.

Tables of Horse Power.

Following are a few of the thousands of questions which are daily asked in connection with the new arts:

Will you explain exactly what "compression" in the motor means?

I heard something of "self-starters." Can you tell me who manufactures them?

Will you tell me something about the notable automobile engineers, Charles Schmidt and A. L. Riker?

Who is the designer of the Pierce Arrow?

Where can I find the Eisemann Magneto in America?

In what year was the first Vanderbilt race run, who was the winner, and what was his average speed?

What are the automobile laws and regulations in Iowa?

In what year was the first Royal Tourist marketed?

What are the tariff duties in Austria on American automobiles?

Who is the Baltimore agent of the Stoddard-Dayton?

How can I join the A. A. A.?

Most of the above questions can be answered by consulting 20 or 30 different publications, which would take considerable time, but there is not a single publication now in existence which answers all these questions.

The INTERNATIONAL MOTOR CYCLOPAEDIA, which is here presented, will permit anybody who knows how to use a dictionary to get the information desired immediately. Every friend or adept of the automobile, motor boat or aerial navi-

gation, the engineer, the designer, the manufacturer, will use the Motor Cyclopaedia in order to obtain precise and immediate information.

The Cyclopaedia will be found in all libraries, public or private, newspaper offices, counting rooms, homes, social clubs, as well as automobile clubs, motor boat clubs, aero clubs, country clubs and hotels all over the world.

As the title "Year Book" implies, this work will be published yearly.

Expressions change continually as well as addresses. Such changes when occurring will be recorded in the succeeding Year Book.

An undertaking of such magnitude as the INTERNATIONAL MOTOR CYCLOPAEDIA cannot be perfected at the outset. The co-operation of its readers is essential, therefore, both in supplying omissions and in calling attention to such errors as may have crept in the present edition, as well as in suggesting additions or new features for future editions of the work.

The publishers have spared no expense and no labor to make the INTERNATIONAL MOTOR CYCLOPAEDIA complete and accurate, and they believe that they have succeeded measurably well. Criticisms of the volume herewith submitted are invited and will meet with due consideration.

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Mail the above to the Publishers of

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Times Building, New York, before January 15, 1909.

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A Technological Reference Book

A

A.—The symbol for "ampere."

a.—The first letter of the Greek alphabet, usually designates an "angle."

A-h.—Abbreviation of the expression "ampere-hour."

A-t.—Abbreviation of the expression "ampere-turn."

A. & J. Mfg. Co.—26 W. Randolph St., Chicago, Ill. Mfrs. crank hangers, brackets for motor cycles, brazing compounds for cast iron. Cap. \$2,000. Est. 1898. Charles L. Jenness, Pres. and Treas.; Howard C. Runsey, Sec.

A-Z Co., The.—527 W. 56th St., New York City. Mfrs. radiators, hoods, mud guards, sprocket covers, tanks, racing bodies, metal dashes, special fittings, aluminum brazing and beating, metal hampers and trunks, metal tool boxes, fans, mufflers, pipe and tube bending and brazing, repairing of all kinds. Member M. & A. M. Cap. \$5,000. Est. Sept., 1904. J. E. Woodbridge, Pres., Mgr. and Treas.; R. S. Woodbridge, Sec.

A. B. C. Motor Vehicle Co.—1512 Locust St., St. Louis, Mo. Makers of the A. B. C. car. First marketed, Oct., 1906. Two models made in 1907, six in 1908. Cap. \$45,000. A. B. Cole, Pres.; R. L. Steele, Vice-Pres.; H. C. Cole, Sec. and Supt.; F. E. Strous, Gen. Mgr., Treas., Pur. Agt., Sales and Advt. Mgr.; Louis Goss, Designer.

Aachener Stahlwarenfabrik Actien Gesellschaft.—Aix-la-Chapelle, Germany. Mfrs. automobiles, gas. (Fafnir cars); motors.

Abaft.—On the aft or hind part of a boat.

Abbe, A. N.—Pur. Agt. Corbin Motor Vehicle Corp., New Britain, Conn.

Abbey & Co., P. L.—Kalamazoo, Mich. Mfrs. emergency accident cabinets.

Abbott, A. J.—Pres. National Spring & Wire Co., Albion, Mich.

Abbot's Garage.—Fort Worth, Tex. (Buick); garage.

Abbott's Garage.—West Derry, N. H. Garage.

Abbot, W. H.—1263 Broadway, New York City. Mfrs. monograms, name plates.

Abbott, W. H.—Hudson, Mich. (Jackson.)

Abeam.—Opposite the center of a boat's side; on a line which forms a right angle with it.

Abell, Rollin.—370 Atlantic Ave., Boston, Mass. Mfrs. steam engines.

Abel Mfg. Co.—1112 Great Northern Bldg., Chicago, Ill. Mfrs. lamps.

Abelos, H.—11 rue Raspail, St.-Ouen, France. Mfr. spark plugs.

Abendroth & Root Mfg. Co.—Newburgh, N. Y. Mfrs. automobiles, gas. (Frontenac.)

Abercrombie & Fitch.—57 Reade St., New York City. Mfrs. collapsible buckets, auto covers.

Aberdeen Auto Co.—Aberdeen, So. Dak. (Cadillac.)

Abraham, Lawrence.—Member Long Island A. C., A. C. A. B., Dec. 3, 1872, at Brooklyn, N. Y. Graduate Cornell, 1895, degree B. L. Business, dry goods, 422 Fulton St. Res. 800 St. Marks Ave., Brooklyn, N. Y. Owned Locomobile steamer in 1902.

Abrahamson, H. A.—Pres., Sec., Treas. and Gen. Mgr. The Robert Instrument Co., 56 Shelby St., Detroit, Mich.

Abrams, Chas. E.—Chatham, N. Y. Repairing.

Abrasive.—Any hard substance for grinding or wearing away a softer substance. See Carborundum and Emery.

Abresch Co., Charles.—389 4th St., Milwaukee, Wis. Mfrs. wood and metallic bodies, auto tops.

Acceleration.—The variation in speed that a body undergoes in a unit of time. It is positive or negative, according as the speed increases or diminishes. It is expressed in feet per second per second.

If a body of a mass M be submitted to a force constantly equal to F it will undergo an acceleration expressed by the formula $a=F$.—"Angular acceleration" is the rate of increase of angular velocity (q.v.).

Accelerator.—A combination of levers and rods which can be actuated by the driver of a motor-car at will, and the object of which is to modify the action of the governor in order to increase the speed of the car.

The accelerator is, in most cases, controlled by a small pedal which is pulled back to its natural position by a spring as soon as the pressure of the driver's foot has ceased. It is sometimes also controlled by a lever or by a handle on the steering-wheel.

Accelerator-pedal.—See Pedal.

Accessories.—A term by which is to be understood all those objects which do not form an integral and constituent part of the frame or carriage-work of a motor-vehicle, such as the annunciator, lamps, horns, sirens, air-pumps, etc.

Accumobile.—A name proposed, but seldom employed, for an automobile actuated by accumulators.

Accumulateurs, T. E. M.—24 rue Folie-Méricourt, Paris, France. Mfrs. storage batteries.

Accumulator.—See Cell, Storage.

Acetone.—An inflammable, colorless, limpid liquid of an ethereal odor, having the chemical formula C_3H_6O and density of 0.81. It boils at $55.5^\circ C.$ ($132^\circ F.$), and the density of its vapor (referred to air) is 2.022. It has the peculiar property of dissolving many times its volume of acetylene gas, the amount varying with the pressure to which it is submitted. It burns with a bright blue flame in giving out acetic acid. It is miscible in all proportions with water, alcohol and ether.

Acetone is used in the automobile industry, (1) as a solvent of acetylene, (a) for automobile searchlights, (b) for certain soldering operations by the oxy-acetylene blowpipe; (2) as a solvent of celluloid for cementing accumulator troughs, and (3) as a carburetting agent in gas motors.

Acetylene.—A colorless gas with the formula C_2H_2 and density of 0.92, produced by the action of water upon calcium carbide. One pound of the latter with a little over half its weight of water will liberate $5\frac{3}{4}$ cubic feet of gas. It has a heat capacity of 18,260 B.t.u. per pound, or 1500 to 1558 per cubic foot, and weighs 0.0725 pound per cubic foot, or occupies $14\frac{1}{2}$ cubic feet to the pound. It has been compressed to a liquid at $20^\circ C.$ ($68^\circ F.$) by a pressure of 600 pounds per square inch. In burning, it gives a light next in brilliancy and beauty to the electric arc, if care be taken to use it under a certain pressure in burners with a very small aperture. In most cases such burners are provided with convergent tips which cause the jets of gas to meet and spread out in the form of a

wide, flat flame, which, on account of the wide surface of air with which it thus comes into contact, is very free from smoke. Standard acetylene burners yield 24 candle-power per $\frac{1}{2}$ foot of gas consumption per hour. Acetylene is largely used for lighting motor-car lamps, yacht and buoy lamps, etc. It has also been employed to a certain extent for operating vehicle motors, but thus far has been found too costly for such service. See Carburetter.

The piping for acetylene should be of iron, lead, brass or rubber, but never of copper, which forms with acetylene an explosive compound.

Acetylene, dissolved.—Acetylene dissolved in acetone, which possesses the remarkable property of being able to absorb twenty-five times its own volume of acetylene at atmospheric pressure, and at a temperature of $60^\circ F.$, its power of absorption increasing proportionately with the pressure. Compressed in cylinders it is used as an illuminant.

Acetylene Gas Illuminating Co.—105 Walker St., New York City. Mfrs. French "Candy" carbide, acetylene burners, acetylene tanks and generators. Cap. \$50,000. Est. 1897. E. Thomey-Cavalleris, Pres. and Treas.; Wm. H. Babcock, sec.; K. C. Thomey-Cavalleris, Vice-Pres.

Acetylene Generator.—An apparatus in which acetylene gas may be constantly produced through the action of water upon calcium carbide in quantities sufficient to keep one or more motor-car lamps supplied.

Acetylene Journal.—324 Dearborn St., Chicago, Ill. Pub. monthly by the Acetylene Journal Pub. Co.

Acetylite.—Calcium carbide treated with glucose, and having the property of regulating the action of water on the carbide in such a way as to render the production of acetylene slower and more uniform.

Acetyvone Co.—38 Park Row, New York City. Mfrs. carbide, acetylene generators.

Achard-Fontanel et Cie.—48 Chemin Ste-Geneviève, Lyon, France. Mfrs. bodies.

Achenbach und Co.—Hamburg, Germany. Mfrs. automobiles, gas. (Hexe cars.)

Acid, Chromic.—An acid in the form of quadrangular crystals of a deep red color. It is used in solution as a depolarizer in primary battery cells.

Acid Cure.—A preparation employed for patching rubber tires, and which produces an effect similar to vulcanization.

Acid, Hydrochloric.—A colorless gas ($H. Cl.$) with a keen acid smell, and very soluble in water. The solution of the gas found in commerce is a yellow

liquid commonly called "muriatic acid," or "spirits of salt." Scrap zinc added to the acid until it is neutralized, or, to use the popular term, "killed," is used in soldering. See Soldering.

Acid, Picric or Carbazotic.—An organic compound obtained by the action of concentrated nitric acid upon phenic acid or phenol, whence its scientific name of trinitrophenol.

It forms prismatic sulphur-colored crystals having an intensely bitter taste, sparingly soluble in water, but quite soluble in alcohol and ether. It fuses at 122° C. (251.5° F.). Heated suddenly it detonates. When fused it constitutes an explosive of great power, and is dangerous only in this or a highly compressed state.

Gasolene will absorb about 5 per cent. of its weight of picric acid, but the addition of a small quantity of kerosene will enable it to take up at least 10 per cent.

An increase of motor efficiency of from 15 to 20 per cent. is claimed for the picric gasolene mixture. About five ounces of the acid are required for each gallon of gasolene. The mixture should be allowed to stand for two days, with occasional agitating and then be filtered.

The explosive force of the acid is said to be very much overrated. In aqueous solution, picric acid is extremely efficacious against burns. It relieves the pain and hastens cicatrization. It should be applied in the form of a compress of picric gauze, or of a local bath immediately after the accident.

Acid Process.—The early form of the Bessemer process of steel making, in which the converter had a lining containing a high percentage of silica. This silicious or "acid" lining fails to remove phosphorus from the iron and has been replaced by the "basic process."

Acid, Sulphuric.—An acid resulting from the combination of sulphur and oxygen united with water. Its chemical formula is $\text{SO}_4 \text{H}_2$. It is used in the refining of petroleum products, in the manufacture of gun-cotton (for celluloid) and leather. It is utilized also for forming the electrolytic liquid of ignition accumulators, and enters into the composition of the exciting liquids of charging batteries.

Sulphuric acid, called also "oil of vitriol," is a colorless, odorless liquid of an oleaginous consistency, and for accumulator use should be free from arsenic, and, what is more important still, should be chemically pure.

Acidimeter.—A hydrometer for determining the specific gravity of acid used in running storage batteries, to determine when the charging is completed.

Acker, H.—Tottenville, Staten Island. Mfr. motor boats.

Ackerman, E. L.—Sec. and Treas. Jos. N. Smith & Co., Fourth and Porter Sts., Detroit, Mich.

Ackerman, W. K.—Pur. Agt. Reliance Motor Car Co., 89 Fort St., East, Detroit, Mich.

Ackerson, Chas. L.—Mgr. and Treas. Syraeuse Aluminum & Bronze Co., 530 Leavenworth Ave., Syracuse, N. Y.

Acme Auto Co.—310 Liberty St., Troy, N. Y. (Mora.)

Acme Automobile Co.—3944-46 Olive St., St. Louis, Mo. (Reo.)

Acme Fdry. Co.—Sweeney St., Cleveland, Ohio. Mfrs. gray iron castings.

Acme Garage.—443-445 Fourth St., Brooklyn, N. Y. Garage.

Acme Garage Co., Inc.—13th and Tacoma Ave., Tacoma, Wash. Garage. (Cadillac, Knox, Winton.)

Acme Motor Car Co.—8th and Elm Sts., Reading, Pa. Makers of the Acme car. First marketed, 1900. Seven models made since. Cap. \$300,000. H. M. Sternbergh, Pres. and Gen. Mgr.; R. E. Graham, Vice-Pres., Sales and Advt. Mgr.; H. L. Hoff, Sec., Treas. and Pur. Agt.; R. A. Hardy, Designer; O. H. Bickel, Supt. Agents: Scull, John I., 258 N. Broad St., Philadelphia, Pa.; Boston Motor Co., 43 Columbus Ave., Boston, Mass.; Keystone Motor Car Co., 644 Telegraph Ave., Oakland, Cal.; J. W. Mears, 9 Ocean Parkway, Brooklyn, N. Y.; Manhattan Motor Car Co., 1329 Michigan Ave., Chicago, Ill.; Pecos Auto Co., Pecos, Tex.; Arlington Motor Car Co., 5971 Center Ave., Pittsburg, Pa.; Brewster & Co., J. B., 7th Ave. and 49th St., New York City.

Acme Motor Co.—302 W. 8th St., Reading, Pa. Garage. (Acme.)

Acme Oil & Supply Co.—345 So. Canal St., Chicago, Ill. Mfrs. grease, oils, auto body soaps.

Acme Oil Engine Co.—Union Ave., near R. R., Bridgeport, Conn. Mfrs. motors (kerosene).

Acme Rubber Co.—925 Jefferson Ave., Toledo, Ohio. Garage and rental business; vulcanizing.

Acme Spring Check Co.—1717 Broadway, New York City. Mfrs. shock absorbers.

Acme Steel & Malleable Iron Works.—245 Military Rd., Buffalo, N. Y. Mfrs. steel and malleable iron castings. Est. 1895. E. G. Fetchonsen, Prop.

Acme White Lead & Color Works.—Detroit, Mich. Mfrs. paints, enamels and varnishes. Acme system automobile methods of finishing. Cap. \$1,250,000. Est. 1884. Wm. L. Davies, Pres.; Thos. Neal, Sec. and Gen. Mgr.; H. Kirke White, Vice-Pres.; A. E. F. White, Treas.; R. S. Brown, Sales Mgr. automobile Dept.

Acorn Brass Mfg. Co.—51 No. Peoria St., Chicago, Ill. Mfrs. timers, priming cups, carburetters, contract work. Cap. \$200,000. Est. 1890.

Active Auto Co.—605 Van Ness Ave., San Francisco, Cal. (Mora, Commerce.)
Acton Garage.—137 W. 89th St., New York City. Garage.

Adair, Robt. M.—Shop Supt. Union Automobile & Supply Co., Plainview, Tex.

Adamie e Co.—10 via Artisi, Florence Italy. Mfrs. automobiles, gas. (Rondine cars); motors (auto).

Adam.—Leipzigerstrasse 27, Berlin, Germany. Mfrs. wearing apparel (fur hats, fur caps, fur coats).

Adamite Abrasive Co.—Schenck St., Tonawanda, N. Y. Mfrs. emery wheels.

Adams & Elting Co.—155 W. Washington St., Chicago, Ill. Mfrs. enamel, paints, auto body polishes, metal polishes, varnishes.

Adams & Engs.—1712 Michigan Ave., Chicago, Ill. (Frayer-Miller, Earl.)

Adams & Hart.—47 N. Division St., Grand Rapids, Mich. (Indian, Franklin, Elmore, Peerless.)

Adams Automobile Co.—Winona, Minn. (Cadillac.)

Adams Co., The.—4th and White Sts., Dubuque, Ia. Makers of the Adams Farwell car. Mfrs. special automobile machinery. First automobile made in 1898 for private use, four models marketed since. Cap. \$100,000. Eugene Adams, Pres.; Herbert Adams, Sec. and Treas.; F. O. Farwell, Gen. Supt.

Adams Co., The.—Dubuque, Iowa. Mfrs. special automobile machinery.

Adams, Eugene.—Pres. The Adams Co., Dubuque, Iowa.

Adams, A. L.—45 Salem St., Worcester, Mass. Mfrs. hydrometers.

Adams, B. F.—Mgr. White Co., 16-18 R. R. Place, East Orange, N. J.

Adams, George S.—74 Grove Ave., Elgin, Ill. Garage.

Adams, H.—Tunbridge Wells, England. Mfrs. jacks.

Adams, Herbert.—Sec. and Treas. The Adams Co., Dubuque, Iowa.

Adams, Henry J.—Tiffin St., Fostoria, Ohio. (Reo.)

Adams Mfg. Co.—147 Queen Victoria St., London, England. Mfrs. automobiles, gas. (Adams.)

Adamson, Prescott.—Broad and Spring Garden Sts., Philadelphia, Pa. (Columbia, Renault.) Est. 1906. Repairing.

Adams, S. L.—Joplin, Mo. (Cadillac.)
Adams, W. J.—Hanover, Pa. (Maxwell.)

Adams, Wm. F.—339 Broadway, New York City. Mfr. cloth and carpet trimmings.

Adapt Machinery Co., The.—1624-34 Wabash Ave., Chicago, Ill. Mfrs. glass wind shields, automobile bumpers, gears, lubricators, springs, luggage carriers, chain tools and special gears to pattern; automobile repairing.

Addendum.—The difference between the real and the geometrical radius of a circular gear-wheel, that is to say, between the radius of the pitch-circle and the outer circle which touches the crests of the teeth. See Pitch Circle.

Adelsperger, C. C.—Sec. Union City Body Co.; factory West Pearl St., Union City, Ind.

Ader, Ltd., Société des Anciens Etablissements.—40 ter, ave de Suffren, Paris, France. Mfrs. automobiles, gas; automobiles, gas, commercial. (Ader cars and trucks.) Automobile motors, marine motors.

Adhesion.—The adhesion of two bodies is the force of friction developed by their contact and offering an opposition to their relative displacement. It is the friction corresponding to the unit of normal pressure. In designating it by f and the normal pressure by P , the force of friction Q will be expressed by the formula:

$$Q = Pf.$$

The friction therefore depends only upon the co-efficient f and upon the normal load P . It is independent of the surface of friction. In the case of parts of machines that have to slide upon each other, a wide development is given to the rubbing surfaces only with a view to reducing the wear.

The co-efficients of friction applying to journals and to sliding parts of cast iron vary from 0.07 to 0.1 with ordinary lubrication, and from 0.035 to 0.055 with continuous lubrication. The minimum values relate to polished steel rubbing upon hard bronze and to well polished cast iron. Iron journals exhibit black specks that necessitate an abundant lubrication and interfere with a perfect polish.

With metallic brakes it is perfectly safe to take $f=0.2$ (bronze upon cast iron dry and in motion) and $f=0.3$ (cast iron upon cast iron in the same conditions) in preference to soft iron upon hard iron. The friction diminishes when the velocity increases, in a proportion which is far from being negligible, contrary to the opinion that is generally held. Thus, the braking stress of a train at speeds of from 60 to 75 miles an hour is equal to half the stress obtained at the reduced speed of 20 miles an hour, with the same pressure of brake-shoes.

The adhesion of pneumatic tires to the ground probably greatly diminishes when the speed of the vehicle increases.

The adhesion of a belt or brake-band

upon a pulley permits of balancing a force, applied to one extremity by a force, much less, applied to the other extremity.

Adiabatic.—In thermodynamics, pertaining to a process that occurs without the transference of heat from or to the body concerned. Adiabatic compression is such compression of a fluid that no heat leaves or enters it. Adiabatic expansion is a form of expansion that takes place in a gas when there is no means of keeping up the temperature of the gas in the cylinder as it expands, but in which the gas cools by an amount equal in heat units to the external work overcome by the piston when driven by such expanding gas. Adiabatic curve or line is a curve or line that shows graphically the change in volume or degree of pressure of a fluid under adiabatic compression.

Adie & Nephew, Ltd.—156 Warstone Lane, Birmingham, England. Mfrs. tire pumps.

Adirondack Automobile Club.—E. E. Rugus, Sec., Sandy Hill, N. Y. Member A. A. A.

Adirondack Auto Co.—Lake Placid, N. Y. (Cadillac, Thomas, Indian.) Est. 1904. Cap. \$200,000. Godfrey Dewey, Mgr.; Henry Van Hovenberg, Engineer. Garage, 15 cars; repairing; supplies.

Adjustment.—Such regulation of an apparatus as will permit it properly to perform its functions.

Adland Motor Co.—900-902 Madison St., Chicago. (Lambert.)

Adland Storage & Auto Co.—240 7th Ave., Minneapolis, Minn. Garage.

Adler Fahrradwerke Vorm. Heinrich Kleyer.—Frankfort-am-Main, Germany. Mfrs. motorcycles, automobiles, gas.

Admission.—In a steam-engine the admission of steam into the cylinder. In such an engine, the admission stroke is the power stroke. It comprises two periods: the introduction, properly so-called, which lasts during a more or less important fraction of the stroke; and the expansion of the steam, which begins at the closing of the introduction and ceases at the opening of the exhaust. The opening and closing of the admission ports are assured by the distributing organs of the engine. In a gas-motor the admission stroke is a passive working one, in other words, a resistant stroke, since the piston has to suck in the mixture which will afterward be compressed before "exploding." In the gas-motors employed in automobilism, the admission generally utilizes the entire stroke. The quantity of the mixture sucked in is varied by throttling the current of gas or by preservation of a residuum of burned gases. See Suction.

Admission Pipe.—Called also "inlet pipe" and "intake pipe. See Pipe, Inlet.

Admission Valve.—See Valves.

Adolf Ungers Industrialstiebolag.—Arbra, Sweden. Mfrs. motors (auto).

Adrian Steel Casting Co.—Beecher St., Adrian, Mich. Mfrs. steel castings. Cap. \$30,000. Est. 1904. Geo. B. M. Seager, Pres.; H. Withington, Vice-Pres.; E. N. Smith, Treas.; O. T. Palmer, Sec.; Amos M. Kells, Gen. Mgr.

Advance Automobile Co.—18 St. Clair St., Cleveland, Ohio. Garage.

Advance Mfg. Co.—"B" St., 2 blocks north of Main St., Hamilton, O. Mfrs. gasoline motors; transmissions. Cap. \$35,000. O. N. Ritchie, Gen. Mgr. and Sole Proprietor.

Advance Mfg. Co.—Todd Bldg., Kalamazoo, Mich. Mfrs. babbitt metals, brass and copper metals.

Adwear Auto Tire Sleeve Co.—High and Washington Sts., North Attleboro, Mass. Mfrs. anti-skid devices, tire sleeves, tire treads.

A. E. C. Société.—24 rue Folie-Méricourt, Paris, France. Mfrs. spark plugs.

Aero & Marine Motor Co.—60 Pemberton Square, Boston, Mass. Mfrs. marine and aeronautical motors. Cap. \$200,000. Est. 1906. Geo. J. Altham, Pres., Designer and Factory Mgr. at Fall River, Mass. Thos. G. Washburn, Gen. Mgr. and Treas.

Aerocar Motor Co.—Detroit, Mich. Makers of the Aerocar.

Aero Club of America.—12 East 42nd St., New York City. Cortlandt Field Bishop, President; J. C. McCoy, Colgate Hoyt, Dave H. Morris, Vice-Presidents; Chas. Jerome Edwards, Treas.; Augustus Post, Sec'y.; Ernest La Rue Jones, Assistant Secretary. Organized Nov. 1, 1906, to "advance the development of the science of aeronautics and kindred sciences; to encourage and organize aerial navigation and excursions, conferences, expositions, congresses and races; to hold, maintain and conduct games, meets, contests, exhibitions and shows of airships, balloons or other inventions or constructions, designed to be propelled or travel through the air or otherwise; to maintain a club house or club houses, aero garages and other houses, club grounds, electric and gas equipments and other accessories, aeronautic or otherwise, incidental to the business of the corporation upon such terms as the Board of Directors may from time to time provide; to do everything necessary, suitable and proper for the accomplishment of any of the purposes or the furtherance of any of the powers hereinbefore set forth, and to do every act or acts incidental or appurtenant to or connected with the aforesaid business, sports

or powers or any part or parts thereof, provided the same be not inconsistent with the laws under which this corporation is organized." Former President, Captain Homer W. Hedge. Conducted exhibition in 69th Regiment Armory, New York City, January, 1906; exhibited in Grand Central Palace, December, 1906, and October, 1907. Promoted 33 balloon ascensions during 1906; won Gordon-Bennett Cup September 30, 1906; offered Lahm Cup for competition among balloonists, March, 1907. Organized and conducted second annual competition for Gordon-Bennett International Cup Race, St. Louis, Mo., October, 1907. Organized aeronautic exhibit in first building in history of expositions to be erected solely for aeronautics at Jamestown Exposition; held aeronautic congress, Jamestown Exhibition, October 28-29, 1907.

Aero Club de Belgique.—(Belgian Aero Club), Brussels, Belgium.

Aero-Club of France.—Society for the encouragement of aerial locomotion, 84 Rue du Faubourg-Saint-Honoré, Paris (Elysée). The Aero-Club of France, which embraces in its membership of 600 individuals the majority of the sporting and scientific men of France, who are interested in the progress of aerial locomotion, is at present the most important association of aeronauts. The president of the club is M. L. P. Cailletet, and the secretary general is M. George Besancon. The members of the club are entitled to numerous privileges that the committee, which meets monthly, is endeavoring to increase. At the club house there is a library, a reading and correspondence room, a bureau of information, telephone, etc. At the Park of Coteaux de Saint Cloud there is material for the inflation of balloons, a special gas intake, a vast shed capable of housing fully inflated balloons, grounds for the starting of ten balloons, an automobile garage, a lounging room for the members of the club, tennis courts, croquet grounds, a park open the entire year, etc.

Aero Club of Philadelphia.—Philadelphia, Pa. Sec., E. A. Auster, 713 Chestnut St., Philadelphia, Pa.

Aero Club Suisse.—(Aero Club of Switzerland.) Zurich, Switzerland. (Member F. A. I.)

Aero Club of the United Kingdom.—110 Picadilly, London, W., England. E. O. Pope, Sec. (Member F. A. I.)

Aerodrome.—A piece of ground set apart and specially arranged for the maneuvering and ascension of all kinds of aeronautic apparatus, and provided with a building for the storage and care of the same. (2). A name applied by the late Prof. S. P. Langley to a form

of aeroplane devised and experimented with by him.

Aeronaut.—One who navigates the air; a balloonist.

Aeronaute, L'.—19 rue Blanche, Paris, France. Aeronautical publication.

Aeronautical Journal, The.—Gough Square and Bolt Court, London, E. C., England.

Aeronautic Club of France.—58 Rue Jean-Jacques-Rousseau, Paris. Society for the popularization of aeronautic science founded in 1897. President, M. Saunier; secretaries, M. Roger Aubry and M. Riberyre. The Aeronautic Club of France is the sole society of the kind that permits its members to participate in ascensions, gratuitously and by turns.

Aeronautics.—The science of floating in or navigating the air. It involves the two departments of "aerostatics" and "aerodynamics," and the branch of mechanics termed "pneumatics." It includes all forms of aerial navigation.

Aeronautique L'.—58 rue Jean-Jacques-Rousseau, Paris, France. Published by the Aeronautic Club of France.

Aerophile L'.—84 rue du Faubourg Saint-Honoré, Paris, France. Monthly aeronautical magazine.

Aeroplane.—See Aviation.

Aerostat.—An apparatus for sustaining weights in the air: a balloon, a flying-machine.

Aerostatics.—That department of the science of mechanics which treats of the weight, pressure and equilibrium of aeriform fluids and of equilibrium of bodies sustained by them.

Aerostation.—The art or practice of aerial navigation.

Aerostation, L'.—14 rue des Goncourt, Paris, France. Aeronautical publication.

Aetna Brass Mfg. Co.—4800 Hamilton Ave., Cleveland, O. Mfrs. auto hinges, threadles, brass, bronze and aluminum goods of all descriptions. Cap. \$10,000. Est. May 1, 1906. W. J. McGrath, Pres. and Treas.; Thos. J. Flanigan, Vice-Pres. and Sec.

Aft.—At or toward the stern of a vessel.

After-burning.—The continued combustion of the charge after the explosion has occurred in a gas-motor.

After-firing.—A series of violent explosions in the muffler (sometimes incorrectly called "back-firing"), commonly caused by misfires in one or more cylinders, permitting of the accumulation in the muffler of unburned gas, which is ignited by the heat of the walls or by the exhaust of the firing cylinders.

Agou & McLagou.—1131 Welton St., Denver, Col. Repairing.

Aguayo, J.—Cochabamba, Bolivia. (Knox.)

Ahreleger, F. W.—Fredericksburg, Tex. (Waltham.)

Ahren, Fred.—Vice-Pres. and Supt. of Works, Waukesha Motor Co., 110 North St., Waukesha, Wis.

Aide-Memoire de L'Automobile.—(Automobile Law publication), Paris, France.

Aigle.—65 rue de Lafayette, Paris, France. Mfrs. automobiles, gas. (Aigle cars.)

Aiken, John P.—Sec., Gen. Mgr., Pur. Agt., Sales and Advt. Mgr., Bellefontaine Automobile Co., Bellefontaine, Ohio.

Ainslie, Geo.—1140 Dean St., Brooklyn, N. Y. Rental service.

Air.—Atmospheric air is a mixture, by volume, of 21 per cent. oxygen, 78 nitrogen, and 1 argon; and, by weight, of 23 oxygen, 75.66 nitrogen, 1.34 argon, with variable quantities of aqueous vapor, carbon dioxide, ammonia, ozone, acid compounds of nitrogen and sulphur, and small amounts of many other gases. 100 cubic inches at 60° F. (15.5° C.) and 30 inches barom. weigh 30.935 grains, and hence a cubic foot weighs 536.96 grains, which is 1-816 of the weight of a cubic foot of water at the same temperature. One pound of it occupies 13.8 cubic feet of space. It is the resistance of the air that is the principal obstacle to the speed of motor vehicles. Such resistance is further increased by the live force of the air in motion, the velocity of which varies from that which scarcely moves a leaf to that which levels a forest.

VELOCITY AND FORCE OF WIND.

	Velocity in miles per hour.	Force in pounds.
Hardly perceptible	1	
Gentle breeze	4	
Pleasant wind	6	
Brisk wind	10	
Very brisk wind	18	1.3
	15	
High wind	25.5	2.6
Very high wind	36	5.2
Storm wind	50	10.4
Great wind	62	15.6
	76	20.8
Hurricane	80	26.
	88	31.25
	95.2	36.5
Violent hurricane	101.6	41.7
	108	46.9

The resistance of the air, which is of slight consequence in the case of low speeds, becomes of considerable importance when a car attains a speed of 10 or 15 miles an hour.

The horse-power required to drive an automobile against the resistance of the air may be approximately calculated by the formula:

$$H.P. = \frac{V^3 \times A}{240,000}.$$

Where V is the velocity of the car in feet per second, A the projected area of the front of the car in square feet, and H.P. the horse-power required to overcome the resistance of the air.

To find approximately the horse-power required to drive a car against a wind of known velocity, the speed of the car must be added to that of the wind, and the horse-power may be found either by the use of the above formula or by reference to the following table, which gives the horse-power per square foot of projected surface necessary to propel a car against the resistance of the air, with varying speeds in miles per hour or velocities in feet per minute:

Miles per hour of car.	Feet per second.	H. P. per sq. ft. of surface.
10	14.7	0.013
15	22.7	0.44
20	24.6	0.105
25	36.7	0.205
30	44.	0.354
40	58.7	0.84
50	73.3	1.64
60	87.9	2.83
80	117.3	6.72
100	146.6	13.12

Air-bound.—See Air Lock.

Air Cooling.—See Cylinder Cooling.

Air-gap.—In a dynamo or electric motor, the space that intervenes between the poles of the field magnet and the armature. See Spark Gap.

Air-gauge.—See Gauge, Air.

Air-hole.—The same as Blow-hole, q. v.

Air-inlet.—A circular opening in the float chamber of the carburetter to permit of the entrance of air.

Air-inlet, Auxiliary.—An inlet in the carburetter, between the needle-valve and the motor cylinder to allow additional air to enter when the motor is running at extremely high speed.

Air-lock.—A trouble sometimes experienced with tube radiators through a small quantity of air becoming enclosed in the bend of one of the tubes and preventing the circulation of the water.

Air-pump.—See Pump, Air.

Air-regulator.—A device for varying the proportions of hot and cold air admitted to the carburetter.

Air-ship.—See Balloon, Dirigible.

Air-valve., Automatic.—See Valve, Air.

Ajax.—80 Hirschengraben, Zürich, Switzerland. Mfrs. automobiles, gas. (Ajax.)

Ajax-Grieb Rubber Co.—Trenton, N. J. Mfrs. automobile tires and moulded rubber specialties. Member M. & A. M. Cap. \$400,000. Est. Nov. 14, 1905. Horace DeLisser, Pres.; Wm. G. Grieb, Vice-Pres.; Harry Grieb, Sec. and Treas.; Louis P. Destribats, Supt. Branches: 57th St. and Broadway, New York City; 1418 Michigan Ave., Chicago, Ill.

Aker, E. S.—Pres. Victor Shock-Ab-

sorber Co., 1937 Broadway, New York City.

Akron Automobile Club.—Dr. F. W. Work, Sec., Akron, Ohio. Member A. A. A.

Akron Automobile Garage.—Cor. Main and Cedar Sts., Akron, Ohio. (Franklin, Winton.) Supplies; garage; repairs.

Akron Pneumatic Tire & Protector Co.—Akron, Ohio. Mfrs. anti-skid devices, tire shoes, tire sleeves, vulcanizers.

Akron Mfg. Co.—927 So. High St., Akron, Ohio. Mfrs. oil cans, tire treads.

Aktiebolagge Davy Robertsons Wasinfabrik, Guldbrasens & Son.—Göteborg, Sweden. Mfrs. motors (motor-cycle).

Aktiebolagge Octopedmotorbiblioteks-golau—Stockholm, Sweden. Mfrs. motors (auto).

Aktiengesellschaft vorm, J. Merlich.—Sophienstrasse 21, Berlin, Germany. Mfrs. chains.

Alameda County Automobile Club.—F. F. Weston, Sec., 1392 Webster St. Oakland, Cal.

Alameda Island Auto Club.—Alameda, Cal.

Alarm, Low-water.—A device used on steam-carriages, and which is so constructed that when the water from the boiler has fallen below the desired level a valve is opened and steam admitted to the whistle.

Albany Automobile Club.—C. D. Hakes, Sec., 61 Lancaster St., Albany, N. Y. Member A. A. A.

Albany Automobile Co.—Albany, Ind. Makers of the Albany runabout and surrey. First marketed May 14, 1907. Five different models made since. Cap. \$10,000. John L. Tulley, Pres., Designer and Supt.; Walter Bryan, Vice-Pres.; W. L. Cory, Sec., Treas., Gen. Mgr., Sales and Advt. Mgr.

Albany Engineering Co.—Goshen St., Camberwell, London, S. E., England. Mfrs. circulating pumps.

Albany Garage Co.—28-30 Howard St., Albany, N. Y. (Peerless, Matheson, Isotta, Stevens-Duryea.) Supplies; garage; repairing.

Albany Hardware & Iron Co.—48-50 State St., Albany, N. Y. Inc. 1891. Dealers in automobile supplies and sporting goods; complete line of general hardware. Chas. H. Turner, Pres.; Wm. I. Baker, Vice-Pres.; Jas. K. Dunscomb, Treas.; W. B. Wackerhagen, Sec.; W. E. Foskett, Mgr. of automobile supplies and sporting goods department.

Albany Hdwe. & Specialty Co.—Albany, Wis. (Waltham.)

Albany Mfg. Co., Ltd.—Cumberland Park, Willesden Junction, London, England. Mfrs. differential gears, radiators, metal wheels, springs, steering gears.

Albaugh Bros., Dover & Co.—Marshall Blvd. and 21st St., Chicago, Ill. Agts. Sterling Star cars. Est. 1901. Cap. \$1,000,000. H. P. Albaugh, Pres.; G. S. Albaugh, Treas.; O. T. Dover, Vice-Pres.; R. Myers, Sec.; Head of motor and automobile dept. F. H. Squires.

Albaugh, E. Ray.—Pres. Bellefontaine Automobile Co., Bellefontaine, Ohio.

Albaugh, G. S.—Treas. Albaugh Bros., Dover & Co., Marshall Blvd. and 21st St., Chicago, Ill.

Albaugh, H. P.—Pres. Albaugh Bros., Dover & Co., Marshall Blvd. and 21st St., Chicago, Ill.

Albercrombie, C. R.—Kansas City, Mo. (Monarch.)

Alberta Motor Co.—Medicine Hat, Alta., Canada. (Maxwell.)

Albertson, C. C.—540 Washington St., Camden, N. J. (Autocar.)

Albin, H. A.—152 No. Main St., Concord, N. H. Garage.

Albion Motor Car Co., Ltd.—South St., Glasgow, Scotland. Mfrs. automobiles, gas. (Albion.)

Alborak Auto Co.—Broadway and 62nd St., New York City. Garage.

Albright Auto Co.—Crawfordsville, Ind. (National.)

Albright Mfg. Co.—Columbus, Ohio. Mfrs. spark plugs.

Albro, L. F.—Vice-Pres. and Mgr. Agency Dept, Chelsea Auto Storage Co., 516-520 W. 37th St., New York City.

Albuquerque Cycle & Arms Co.—115 Gold St., Albuquerque, N. M. (Winton, Waltham.)

Alcohol.—A volatile, inflammable liquid of burning taste composed of carbon, hydrogen and oxygen. There are two kinds of alcohol used in the arts as sources of heat, viz., ethyl alcohol, the common form (C₄ H₆ O₂), and wood alcohol (C₂ H₄ O₂), called also wood naphtha.

Wood alcohol is obtained by the dry distillation of wood. It has a strong characteristic odor and boils at 66° C. (150° F.). A mixture of 90 per cent. raw spirit (crude ethyl alcohol) and 10 per cent. wood spirit (crude methyl alcohol), to which some paraffine oil has been added, is called "methylated spirit," and is used as a solvent and for burning and other purposes.

Ethyl alcohol is obtained by distillation from fermented infusions of cereal grains, such as corn, wheat, etc., and from potatoes and beets. It has a specific gravity of 0.792 and boils at 78° C. (173° F.).

Pure alcohol is very inflammable and burns with a pale blue smokeless flame, and, being very volatile, readily forms a vapor which, when mixed with air, is

Alcohol is of interest in connection with the automobile only because it may serve as a fuel for explosive motors.

For motor purposes, it is customary to mix alcohol with some other hydrocarbon usually belonging to the petroleum group. Such mixtures are undrinkable and are known as "denatured" alcohol.

Alcohol, Acetylated.—Alcohol in which a certain quantity of acetylene is dissolved in order to increase its value as a fuel, and render it unfit for drinking.

Alcohol, Denatured.—A common French mixture consists of ethyl alcohol 100 volumes, methyl alcohol 10 volumes and a petroleum distillate 0.5 volume. An alcohol mixture known as "electrine" is composed of equal parts of the above mixture and benzole, and has a specific gravity of .835 and a calorific power of 13,150. The United States Commission of Internal Revenue prescribes as agents for denaturing alcohol, methylic alcohol and benzine, in the proportions of 10 per cent. of the former and one-half of one per cent. of the latter, constituting completely denatured alcohol. Alcohol denatured in any other manner is claimed as special denatured alcohol.

An internal combustion motor that is to operate with alcohol should work with a higher compression of the charge before igniting than is satisfactory for gasoline or kerosene. The carburetting apparatus must also be kept hotter, especially if the alcohol is considerably hydrated.

In some trials in Paris, the thermal efficiency of four fuels used in motors was found to be:

Gasoline.....	14 to 18 per cent
Kerosene.....	13 "
Gas.....	18 to 31 "
Alcohol.....	24 to 28 "

In the winter of 1906-07 tests were conducted in this country in which gasoline, kerosene and denatured alcohol were used, and the respective efficiency of these fuels was found to be as follows:

Car	Weight	Cost Gal.	Con- sumption	Cost of Fuel	Cost per Car Mile	Cost per Ton Mile
Gasoline	2,270	\$0.20	24.75	\$4.95	\$0.019	\$0.0169
Kerosene	2,520	0.13	33.75	4.39	0.017	0.0159
Alcohol	2,750	0.37	40.75	15.07	0.06	0.0448

An objection which has revealed itself with motors using alcohol is that an excess of aqueous vapor forms in the cylinders, and that such vapor, absorbing the acetic acid which forms with the occasional incomplete combustion of the alcohol, attacks and corrodes metal surfaces and scores valves and valve-seats.

Alcoholmeter.—A form of hydrometer employed for determining the quantity of water contained in the alcohol tested.

Alcohol, Wood.—An alcohol, called

also "methylic alcohol," formed by the dry distillation of wood in iron retorts at a heat not above 900° F. Taken internally it nearly always causes blindness or death, and the internal use of it is now considered fatal. For this reason it is an admirable substance for denaturing ordinary alcohol, and, in fact, is one of the best for such a purpose. A mixture of wood alcohol and water forms an excellent anti-freezing solution.

Alcott, J. S. P.—Sec. Concord Motor Car Co., 64 Huntington Ave., Boston, Mass.

Alden, Geo. I.—Treas. Worcester Pressed Steel Co., Cor. North and Barber Aves., Worcester, Mass.

Alden, H. W.—Mechanical engineer, Timken Roller Bearing Axle Co., Canton, Ohio.

Alderman & Son, D. W.—Alcoln, S. C. (Cadillac.)

Aldigier.—110 rue d'Angoulême, Paris, France. Mfrs. spark plugs.

Aldrich Auto Co.—Atlanta, Ga. Garage.

Aldrich & Burbank.—St Johnsbury, Vt. (Stanley.)

Alexander & Co., H. T.—17 State St., New York City. Mfrs. oil.

Alexander & Co.—72 W. Monroe St., Chicago, Ill. Mfrs. marine and auto motors, reverse gears; complete line of marine and auto fittings. Est. 1900.

Alexander, W. B. D.—Pres. The National-Acme Mfg. Co., Cor. Stanton Ave. S. E. and E. 75th St., Cleveland, Ohio.

Alexander, W. G.—116 10th St., Toledo, Ohio. Garage.

Alger Laboratories.—Providence, R. I. Mfrs. anti-freezing solutions.

Alger, P. B.—244 Union St., Olean, N. Y. Garage.

Alger, R. A.—Vice-Pres. Packard Motor Car Co., Detroit, Mich.

Alignment.—The correct placing in line of the parts of a machine or apparatus.

Alldays and Onions, Ltd.—Fallows Road, Birmingham, England. Mfrs. automobiles, gas. (Alldays.)

Allgemeine Automobil-Zeitung.—Pub. in Vienna, Austria.

Allgemeine Berliner Motorwagen Gesellschaft.—21 Lüneburger Strasse, Berlin, Germany. Mfrs. automobiles, gas.

Allegheny Auto Co.—Pittsburg and Allegheny, Pa. (Austin, Glide, Rapid.)

Allen, Alex.—Chestnut Hill, Pa. (Cadillac.)

Allen, J. A.—372 Smith St., Providence, R. I. (Northern.)

Allen & Son, John C.—Gloversville, N. Y. Mfrs. wearing apparel (gloves and gauntlets).

Allen, Asten & Co.—Greenwich Ave., Greenwich, Conn. (Locomobile, Reo.)

Allen Auto Specialty Co.—1931 Broadway, New York City. Mfrs. tire holders, lamp covers, tire cases.

Allen, E. O.—Director, Carmichael-Bray Co., 370 Golden Gate Ave., San Francisco, Cal.

Allen Co., I. M.—116 South Portland St., Brooklyn, N. Y. (Stevens-Duryea.)

Allen-Kingston Motor Car Co.—3 W. 44th St., New York City. Selling agts. for the New York Car & Truck Co., Kingston, N. Y., makers of the Allen-Kingston car. Cap., \$300,000. E. R. Thomas, Pres.; W. Gould Brokaw, Vice-Pres.; Walter C. Allen, Sec. and Treas.

Allen, L. D.—Western Mgr. Magnolia Metal Co., Fisher Bldg., Chicago, Ill.

Allen Mfg. Co., W. D.—151 Lake St., Chicago, Ill. Mfrs. brass, bronze, aluminum and copper castings; tire holders.

Allen Motor Co.—42 Preble St., Portland, Me. (Cameron, Monarch.)

Allen-Swan Co.—1287-91 Bedford Ave., Brooklyn, N. Y. (Stearns.)

Allen, Walter C.—Sec. and Treas. Morris Park Motordrome Club. Times Bldg., 42nd St. and Broadway, New York City; Sec. and Treas. Allen-Kingston Motor Car Co., 3 W. 44th St., New York City.

Allen, Will, Dr.—Billings, Mont. (Wayne.)

Allenhurst Garage & Auto Station.—135-47 W. 37th St., New York City. B. L. Toplitz, Gen. Mgr. Garage; renting and repairing. (Aerocar.)

Allers & Co., Harry A.—136 Liberty St., New York City. Mfrs. metal polishes.

Allessio, Societa Anonima.—19 via Orto Botanico, Turin, Italy. Mfrs. bodies.

Alley & Gardner.—Tahoka, Tex. (Buick.)

Allez Frères.—2 rue Adolph-Adam, Paris, France. Mfrs. motorcycles.

Allfrey's Auto Garage.—William St., Johnston, N. Y. Est. 1905. (Thomas, Buick, Cadillac, Berlelt and Oldsmobile.) Garage to house 12 cars; repairing.

Allgemeine Automobil-Zeitung.—Weekly publication, 35 Deutsches Kolonialhaus, Berlin, W., Germany.

Allgemeine Automobil-Zeitung.—Weekly publication, 5 Fleischmarkt, Vienna, Austria.

Alliance Motor Car Co.—Court St., Alliance, Ohio. (Jackson.)

Alling & Fields.—331 Lyon St., Dunkirk, N. Y. (Maxwell.)

Allison, James A.—Sec. and Treas. Prest-o-lite Co., 20 So. East St., Indianapolis, Ind.

Allison Mfg. Co.—Philadelphia, Pa. Mfrs. lock nuts and washers.

Alloy.—Alloys may be regarded as solid solutions of metals in metals. Many consist of definite or equivalent proportions of the simple component metals, though some seem to form in any proportion. It is probable that peculiar properties belong to the equivalent or atomic ratio, as is exemplified in the superior quality of brass made in that proportion. Every alloy is, in reference to the arts and manufactures, a new metal on account of its chemical and physical properties. Very slight modifications often constitute very valuable improvements in metallic bodies; and in the industries it is very rarely that metals are used in a pure state. See Aluminum bronze, Antimony, Brass, Bronze, German Silver, Partinium, etc.

Alloy, Fusible.—What are called "fusible metals" are compounds that melt at a low temperature. One of the best known is composed of 1 part of tin, 1 part of lead and 2 parts of bismuth. Such alloys are especially employed for forming fusible plugs for steam boilers. If the pressure and temperature of the latter become too high, the plugs melt and allow the steam to escape. See Bismuth and Plug, Fusible.

Allsopp, James A.—331 Fourth St., Brooklyn, N. Y. Garage.

Allyn Brass Fdry. Co.—Cleveland, Detroit and Buffalo. Mfrs. aluminum, bronze and brass castings. Cap. \$150,000. Est. 1901. E. E. Allyn, Pres. and Mgr. Cleveland plant; Chas. B. Bohn, Sec., Treas. and Mgr. Detroit plant; W. P. King, Mgr. Buffalo plant.

Allyn, Chas. B.—Treas. Mianus Motor Works, Cos Cob, Conn.

Allyn, E. E.—Pres. and Mgr. Allyn Brass Foundry Co., Cleveland, Detroit and Buffalo; Mgr. Cleveland plant.

Alpha Dry Battery Co.—28 Cortlandt St., New York City. Mfrs. primary batteries.

Alpine Automobile Co.—238 West 108th St., New York City. Garage.

Alsten & Goulding.—36 Foster St., Worcester, Mass. Vulcanizing.

Altemus & Co., C. L.—4th and Locust Sts., Philadelphia, Pa. Mfrs. primary timers and secondary distributors, special types from manufacturers' specifications. Est. 1904. Partnership.

Altham, Geo. J.—Pres. Aero & Marine Motor Co., 60 Pemberton Sq., Boston, Mass. Gen. Mgr. at factory, Fall River, Mass.

Altland, M. J.—Alpena, Mich. (Cadillac, Northern.)

Altoona Motor Car Co.—718 Green Ave., Altoona, Pa. (Rambler, Reo, Ford, Jackson). Est. 1905. Officers: Geo. C. Eppelman, R. A. Rohrer, Louis Plack, Jr. Garage (25 cars); repairing.

Aluminoid.—A light, very ductile and easily machined alloy used for crank-chambers and gear-cases. It is composed, by weight, of 60 parts aluminum, 30 parts tin and 10 parts zinc. It possesses a tensile strength of 18,000 pounds per square inch.

Aluminum.—A grayish-white metal having a density of 2.56. It is very malleable and sonorous and is remarkable for its lightness. Its conductivity for heat and electricity is about one-third that of silver, of which it possesses about the same qualities of tenacity and hardness. It melts at about 1148° F. (620° C.). Its tensile strength is about 12 tons per square inch.

The metal occurs in clay, in cryolite, in bauxite, feldspar and china clay. It is obtained by the electrolysis of alumina extracted from bauxite (see Bauxite), an impure aluminum hydrate ($\text{Al Fe}_2 \text{O}_3 \text{H}_2 \text{O}$), or by heating aluminum oxide, as pure as possible, in an electric furnace. The latter is an iron vessel lined with carbon, the vessel itself forming the cathode or negative pole, and the anode consisting of a number of carbon rods. The charge consists of the pure oxide alone or mixed with cryolite (see Cryolite) to serve as a flux. In starting the furnace the electrodes are brought together, and then the anode is gradually raised; the arc rapidly fuses the charge, and the metal begins to separate. The process is continuous. Very pure aluminum is obtained by heating the double bromide of aluminum and sodium with pure sodium. The metal, when pure, is quite permanent in air; it oxidizes only at a very high temperature. Hot water slowly attacks it, forming the hydrate. Hydrochloric acid dissolves it; hot, strong sulphuric acid forms the sulphate, while nitric acid has very little action. Caustic soda solution readily dissolves it and forms sodium aluminate. Aluminum is soldered to itself and to other metals with difficulty. It is very rarely used in a pure state, but is largely employed in that of alloys with copper and iron. Of such alloys "aluminum bronze" (aluminum 10 parts and copper 90 parts) is the most important (see Bronze). It is the strongest of the copper alloys and has the color of gold. "Aluminum brass" is an alloy of copper, zinc and aluminum. See Brass.

The applications of aluminum in the automobile industry in the manufacture of car bodies and panels, gear-casings, water-jackets, etc., and in metallurgy as a reducing agent are rapidly increasing.

Aluminum Co. of America.—Buffalo Ave. and 19th St., Niagara Falls, N. Y. Mfrs. aluminum.

Aluminum Company of America.—Pittsburg, Pa. Mfrs. aluminum.

Aluminum Foundry Co.—Manitowoc, Wis. Mfrs. aluminum; brass, bronze, aluminum and copper castings.

Aluminum Mfg. Co.—Two Rivers, Wis. Mfrs. license numbers, name plates and oil cans.

Aluminum Solder.—See Solder, Aluminum.

Aluminum Solder & Refining Co.—Oswego, N. Y. Mfrs. aluminum solder.

Alundun.—The hardest, sharpest and most durable abrasive material known. For sharpening tools it is made into grinding wheels, which will not draw the temper of the finest steel.

Alvargonzalez.—Gijon, Spain. Mfrs. automobiles, gas. (Hormiga.)

Alvord, J. S.—Pres. Progressive Mfg. Co., 41 Norwood St., Torrington, Conn.

Amalgamation.—In order to prevent, through "local action" (as it is called), the wasting of the zinc electrodes of an ignition or other battery, while the latter is in an inoperative state, it is usual to amalgamate the surface of the zinc with mercury. The surface to be amalgamated should be cleaned by dipping into acid, and then a few drops of mercury should be poured over the surface and rubbed into it with a bit of linen rag tied to a stick. The mercury unites with the zinc at the surface, forming a pasty amalgam. As the zinc in the latter dissolves in the acid, the film of mercury unites with fresh portions of the zinc, and so presents always a clean, bright surface to the liquid.

A new and better process is to add about 4 per cent. of mercury to the molten zinc before casting into plates or rods. If the zinc plates of a battery are well amalgamated there should be no evolution of hydrogen bubbles.

Amarillo Auto Co.—Wichita, Kan. (Maxwell.)

Ambrose, Dr. O. A.—6125 Bartmer Ave., St. Louis, Mo. (Moline.)

Amelot.—Parthenay, Deux-Sèvres, France. Mfrs. elastic wheels.

American Aluminum Coating Co.—100 Diamond Bank Bldg., Pittsburg, Pa. Mfrs. aluminum coated steel sheets.

American Anti-Puncture Tire & Auto Co.—1693 Broadway, New York City. Mfrs. tire sleeves.

American Association of Engine & Boat Manufacturers.—McHenry, Ill. Officers: Everett Hunter, Pres.; W. J. Reynolds, First Vice-Pres.; J. M. Truscott, Second Vice-Pres. and Treas.; C. C. Gibson, Third Vice-Pres.; A. F. Dohn, Sec.; John B. Carpenter, Fourth Vice-Pres. Board of Directors: W. C. Anderson, John B. Carpenter, A. F. Dohn, Everett Hunter, C. C. Gibson, W. J. Reynolds and J. M. Truscott.

American Auto Brass Co.—181 W. Maple St., Columbus, O. Mfrs. cush-

ions, acetylene generators, lamps, metal trimmings.

American Automobile Association, The.—"A. A. A.", 437 Fifth Ave., New York City. Organized February, 1902. William H. Hotchkiss, Pres. (Automobile Club of Buffalo); Lewis R. Speare, 1st Vice-Pres. (Bay State Automobile Association); Asa Paine, 2nd Vice-Pres. (Florida East Coast Automobile Association); Ira M. Cobe, 3rd Vice-Pres. (Chicago Automobile Club); George E. Farrington, Treas. (Automobile Club of New Jersey); Frederick H. Elliott, Sec. (Automobile Club of Syracuse).

Organized at Chicago on March 4, 1902, as an association of clubs, the plan of having an individual membership being rejected. Up to that time the Automobile Club of America, the premier organization, had been the controlling body in the conduct of races, contests and similar functions having more than a local character, but upon the formation of the A. A. A. the latter assumed charge of such events. In 1906 it was decided to admit individual motorists and thus obtain the addition and support of the large number of users of the motor-vehicle not having club affiliations. In February, 1905, the association was incorporated in New Jersey.

Main Objects: "Uniting in one body of all the automobile clubs and individual motorists of the United States; and thus the promotion and furtherance of legislation, reasonable enforcement of motor laws and ordinances, sportsman-like contests and reliable records, as well as all movements both federal and local toward the construction and maintenance of good roads." Executive Committee: William H. Hotchkiss, Chairman; Lewis R. Speare, Jefferson De Mont Thompson, George E. Farrington, Amos G. Batchelder, William K. Vanderbilt, Jr., Sidney S. Gorham. Chairmen of Boards: Chas. Thaddeus Terry, Legislative, 100 Broadway, New York City; Frank B. Hower, Touring, 760 Main St., Buffalo, N. Y.; Robert P. Hooper, Good Roads, 509 Arch St., Philadelphia, Pa.; Jefferson DeMont Thompson, Racine, 26 West 27th St., New York City.

Former Presidents, W. E. Scarritt, Dr. Julian A. Chase, Harlan W. Whipple, Elliot C. Lee, John Farson, Jr.

American Automobile Co.—Mineapolis, Minn. (Stoddard-Dayton.)

American Automobile Co.—Houston, Tex. (American.)

American Automobile Co.—South 2nd and St. Helena Ave., Tacoma, Wash. Wing Bros., Mgrs. (Reo, Stoddard-Dayton.)

American Automobile Co.—Cedar Rapids, Ia. (American.)

American Automobile Co.—5928 Baum St., Pittsburg, Pa. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

American Auto Garage.—933 No. 7th St., Philadelphia, Pa. (American.)

American Auto Machine Co.—1927 1st Ave., So. Seattle, Wash. (Mitchell.)

American Auto Vehicle Co.—254 Jefferson Ave., Detroit, Mich. Mfrs. automobiles, gas.

American Ball Bearing Co.—Edgewater Park and L. S. & M. S. Ry., Cleveland, Ohio. Mfrs. front and rear automobile axles for chain or bevel drive, ball-bearing hubs, steering axles, ball-bearings, ball thrust bearings. Member M. & A. M. Cap. \$740,700 (paid in), (authorized \$1,000,000). Est. 1895. Walter C. Baker, Pres.; Fred R. White, Vice-Pres.; F. Philip Dorn, Sec., Frederick C. Dorn, Treas.; Frank H. Teagle, Pur. Agt.

American Ball Co.—Cor. Kinsley Ave. and Eagle St., Providence, R. I. Mfrs. steel balls, brass balls, thrust bearings, radial bearings and annular bearings. Cap. \$250,000. Est. 1894. W. Penn Mather, Pres.; W. T. Eyer, Sec. and Treas.

American Battery Co.—170-2 So. Clinton St., Chicago, Ill.

American Belting Co.—135 Oliver St., Boston, Mass. Mfrs. belting.

American Blower Co.—Detroit, Mich. Mfrs. forge equipment.

American Boat & Machine Co.—3517 So. 2nd St., St. Louis, Mo. Mfrs. motor boats.

American Brass Foundry Co.—Hyde Park, Mass. Mfrs. brass, bronze, aluminum and copper castings.

American & British Mfg. Co.—Crescent Ave., Bridgeport, Conn. Mfrs. motors, marine and automobile type, 40 to 80 hp.; pressed steel frames, forgings, McCabe lathes. Members M. & A. M. Cap. \$4,000,000. Est. 1902. Geo. W. Hoadley, Pres.; Charles L. Gulick, Vice-Pres.; W. R. Sheldon, Sec. and Treas.; E. B. Lausier, Sales Mgr.

American Bronze Co.—Berwyn, Pa. Mfrs. bronze metals.

American Buggy Auto Co.—4309 Olive St., St. Louis, Mo. Mfrs. automobiles, gas.

American Buffalo Robe Co.—Buffalo, N. Y. Mfrs. auto robes, miscellaneous wearing apparel.

American Carbolite Co.—Constantine, Mich. Mfrs. carbide.

American Carburetor Co.—907 Michigan Ave., Detroit, Mich. Mfrs. carburetors.

American Castings Co.—809 Columbus S. & F. Bldg., Columbus, Ohio. Mfrs. brass, bronze, aluminum and copper castings.

American Chauffeur.—Monthly. Pub. by the American Chauffeur, Inc., 1931 Broadway, New York City. J. A. Brown, Pres.; F. J. Wallace, Vice-Pres.; R. M. Stickle, Editor.

American Coil Co., Inc.—Cor. Wall and Cocasset Sts., Foxboro, Mass. Mfrs. spark plugs, coils, timers, lock switches, ammeters. Members M. & A. M. Cap., \$10,000. Est. 1900. A. M. Davenport, Pres.; Dr. F. A. Bragg, Treas.; W. Chesley, factory mgr.

American Coulthard Co.—Peabody, Mass. Mfrs. automobiles, steam, commercial.

American Die & Tool Co.—Reading, Pa. Mfrs. transmission gears, machine work (to order), gasoline motors (auto).

American Diesel Oil Engine Co.—11 Broadway, New York City. Mfrs. kerosene motors.

American Distributing Co., The.—Cleveland, O. Selling agents for the Long Arm System Co., Elyria Machine Parts Co., W. J. Sculley Mfg. Co., Imperial Wheel Co., Westinghouse Electric & Mfg. Co., McCutcheon Gear & Mfg. Co., Shepard Engineering Co., Cleveland Axle Mfg. Co.

American Dynamic Co.—Port Richmond, N. Y. Mfrs. motor boats.

American Electrical Novelty & Mfg. Co.—308 Hudson St., New York City. Mfrs. ammeters, voltmeters, primary batteries, auto clocks, water glass lamps, wire terminals.

American Electrical Works.—Providence, R. I. Mfrs. insulated wire.

American Electromobile Co.—Detroit, Mich. Mfrs. automobiles, electric; automobiles, commercial, electric.

American Enamel Co.—Providence, R. I. Mfrs. enamel.

American Foundry Co.—Leipsic, O. Mfrs. automobiles, gas. commercial.

American Foundry & Mfg. Co.—Herbert and Wright Sts., St. Louis, Mo. Mfrs. special gray iron cylinder castings, bronze trimmings and castings.

American Garage Co.—5123 Delmar Ave., St. Louis, Mo. (Dragon.)

American Gas Furnace Co.—23 John St., New York City. Mfrs. forge equipment.

American Gasoline Motor Co.—Baldwinsville, N. Y. Mfrs. marine motors, also in process a 2-cycle automobile motor. Cap. \$20,000. J. D. Sweet, Pres.; A. J. Tooley, Vice-Pres.; J. Tallmadge, Sec., Treas., Gen. Mgr., Pur. Agt., Sales and Advt. Mgr.

American Glove Co., The.—18 Churchhill St., Chicago, Ill. Mfrs. gloves and gauntlets.

American Injector Co.—Detroit, Mich.

Mfrs. grease cups, lubricators, oil cups, oil pumps.

American Institute of Electrical Engineers.—(Transactions.) Pub. monthly. 25 W. 39th St., New York City.

American Iron & Steel Mfg. Co.—Lebanon, Pa. Mfrs. bolts, nuts, bar iron and steel, washers.

American Karbel Co.—Jonesboro, Ark. Mfrs. auto covers.

American Lamp Co.—255 Jefferson Ave., Detroit, Mich. Mfrs. acetylene lamps and generators.

American Lamp Works.—253 W. 47th St., New York City. Mfrs. lamps.

American Lava Co.—27-33 William St., Chattanooga, Tenn. Mfrs. acetylene lamp gas burners, tire talc; spark plug cores, gas and gasoline engine insulation, lava. Cap. \$20,000. Est. 1897. P. J. Kruesi, Sec., Treas. and Gen. Mgr.

American Locomotive Automobile Co.—Kinsley Ave., Providence, R. I. Makers of the license Berliet car. First marketed November, 1905. Three models made since. Cap. \$300,000. W. H. Marshall, Pres.; H. F. Ball, Vice-Pres.; Leigh Best, Sec.; R. B. Van Dyke, Asst. to the Vice-Pres.; C. B. Denny, Treas.; James Joyce, Gen. Mgr.; B. D. Gray, Chief Engineer; F. R. Boynton, Supt.; Arthur N. Jarvis, Advt. Mgr. Branch and main offices at 1886 Broadway, New York City. Dealers: Park Square Auto Station, Boston, Mass.; Walden W. Shaw Co., Chicago, Ill.

American Locomotive Automobile Co.—Broadway and 62d St., New York City. (Berliet.)

American Lubricator Co.—Detroit, Mich. Mfrs. grease cups, lubricators, oil cups.

American Machine & Mfg. Co., The.—Cleveland, Ohio. Mfrs. machine work (to order).

American Machine Mfg. Co.—Cor. Champlain and Beaubien Sts., Detroit, Mich. Makers of the Commerce car. First marketed, Feb., 1907. One model made since. Cap. \$100,000. Harry S. Blumenthal, Pres.; D. Blumenthal, Vice-Pres.; Frank V. Nicol, Sec., Treas., Sales Mgr. and Gen. Mgr.; Chas. B. Rose, Designer and Pur. Agt.

American Machinery Mfg. Co.—41 Lewis Wharf, Boston, Mass. Mfrs. spark coils, spark plugs.

American Machinist.—Weekly. Publication offices, 505 Pearl St., New York City.

American Magazine of Aeronautics.—Published monthly at 142 W. 65th St., New York City. Ernest La Rue Jones, Editor.

American Metal Polish Co.—89 Winslow Ave., W. Somerville, Mass. Mfrs. metal polish, silver powder, bar powder,

silver polish, liquid metal polish, pomade, extract. Cap. \$50,000. E. H. Moulton, Pres.; W. G. Parsons, Treas.

American Mica Co.—Newton Lower Falls, Mass. Mrs. mica, gasolene auto motors, gas. marine motors.

American Motor Car Co.—So. Illinois and Henry Sts., Indianapolis, Ind. Makers of the American car. First marketed, July, 1905. Four models made since. Cap. \$100,000 (\$75,000 paid in). V. A. Longaker, Pres.; N. A. Gladding, Vice-Pres.; D. S. Menasco, Sec. and Treas.; F. I. Tone, Gen. Mgr. and Designer; C. M. Mohler, Supt.; W. H. Flowers, Pur. Agt.; American Motor Car Sales Co., New York City, Sales and Advt. Mgr. Dealers: American Automobile Co., Cedar Rapids, Ia.; American Automobile Co., Houston, Tex.; Dalley & Schill, 230 No. 22nd St., Philadelphia, Pa.; American Motor Car & Sales Co., 2230 Broadway, New York City; Elliot, E. W., 339 Bush St., San Francisco, Cal.; Frederick Co., W. A., 16 Columbus Ave., Boston, Mass.; Lewis, Jno. G., Buffalo, N. Y.; Oklahoma Motor Car Co., Oklahoma City, Okla.; Pardee & Canary, Inc., 1218 Michigan Ave., Chicago, Ill.; Peper Automobile Co., 3922 Olive St., St. Louis, Mo.; Renfros Garage, Tonopah, Nev.; Southern California Motor Car Co., 1811 So. Main St., Los Angeles, Cal.; Smith Automobile Co., 1420 Court Place, Denver, Colo.; Willys Co., J. N. Elmira, N. Y.

American Motor Car Manufacturers' Association.—29 W. 42nd St., New York City. Chairman, Benjamin Briscoe (Maxwell-Briscoe Motor Co.); Vice-Chairman, R. E. Olds (Reo Motor Car Co.); Treas., H. O. Smith (Premier Motor Mfg. Co.); Sec., Wm. Mitchell Lewis (Mitchell Motor Car Co.)

Organized February, 1905, as a result of efforts to unite in one organization all, or nearly all, makers of gasolene cars who refused to admit the validity of the Selden patent. The charter members were as follows: Acme Motor Car Co., Reading, Pa.; Aerocar Co., Detroit, Mich.; Ardsley Motor Car Co., Yonkers, N. Y.; Austin Automobile Co., Grand Rapids, Mich.; Bartholomew Company, Peoria, Ill.; Buckeye Mfg. Co., Anderson, Ind.; Crawford Automobile Co., Hagerstown, Md.; Dayton Motor Car Co., Dayton, O.; Dorris Motor Car Co., St. Louis, Mo.; Duryea Power Co., Reading, Pa.; Ford Motor Co., Detroit, Mich.; Jackson Automobile Co., Jackson, Mich.; Knox Motor Truck Co., Springfield, Mass.; Marion Motor Car Co., Indianapolis, Ind.; Maxwell-Briscoe Motor Co., Tarrytown, N. Y.; Mitchell Motor Car Co., Racine, Wis.; Moline Automobile Co., East Moline,

Ill.; Moon Motor Car Co., St. Louis, Mo.; National Motor Vehicle Co., Indianapolis, Ind.; Nordyke & Marmon Co., Indianapolis, Ind.; Premier Motor Mfg. Co., Indianapolis, Ind.; St. Louis Motor Car Co., Peoria, Ill.; Wayne Automobile Co., Detroit, Mich. In January, 1906, the association joined with the Automobile Club of America, which was promoting its Sixth Annual Show. It was held in the 69th Regiment Armory, then just completed. This move was necessitated by the fact that the Association of Licensed Automobile Manufacturers had secured control of Madison Square Garden and was to hold its show there, restricting the exhibit of gasolene cars to the product of licensees under the Selden patent. In January, 1907, and again in October, 1907, the Automobile Club of America and the Y. M. C. A. co-operated as before and held their show in the Grand Central Palace.

The officers and chairmen of committees and committee of management are as follows: Chairman, Benj. Briscoe (Maxwell-Briscoe Motor Co.); Vice-Chairman, R. E. Olds (Reo Motor Car Co.); Treas., H. O. Smith (Premier Motor Mfg. Co.); Sec., Wm. Mitchell Lewis (Mitchell Motor Car Co.); Show Committee, H. O. Smith (Premier Motor Mfg. Co.); Tours and Races, W. C. Marmon (Nordyke & Marmon Co.); Good Roads, Chas. Lewis (Jackson Automobile Co.); Legislation, R. E. Olds (Reo Motor Car Co.); Membership, W. H. Van Dervoort (Moline Automobile Co.); Finance, James Couzens (Ford Motor Co.); Standardization and Technical, John D. Maxwell (Maxwell-Briscoe Motor Co.); Freight and Transportation, W. G. Morley; Tires, Wm. Mitchell Lewis (Mitchell Motor Car Co.); Committee of Management: Chairman, Benj. Briscoe (Maxwell-Briscoe Motor Co.); Vice-Pres., R. E. Olds (Reo Motor Car Co.); Treas., H. O. Smith, (Premier Motor Mfg. Co.); Sec., Wm. Mitchell Lewis (Mitchell Motor Car Co.); Charles Lewis (Jackson Automobile Co.), W. H. Van Dervoort (Moline Automobile Co.), W. C. Marmon (Nordyke & Marmon Co.), Counsel, Job. E. Hedges; Gen. Mgr., Alfred Reeves.

The present membership is as follows:

Abendroth & Root Mfg. Co., Newburgh, N. Y.; Acme Motor Car Co., Reading, Pa.; Aerocar Motor Co., Detroit, Mich.; American Machine Mfg. Co., Detroit, Mich.; American Motor Car Co., Indianapolis, Ind.; Austin Automobile Co., Grand Rapids, Mich.; Atlas Motor Car Co., Springfield, Mass.; Bartholomew Co., The, Peoria, Ill.; B. L. M. Motor Car Co., 36 Delevan St., Brooklyn, N. Y.; Brush Runabout Co.,

Detroit, Mich.; Buckeye Mfg. Co., Anderson, Ind.; Chadwick Engineering Works, Philadelphia, Pa.; Continental Auto Mfg. Co., New Haven, Conn.; Crawford Automobile Co., Hagerstown, Md.; Dayton Motor Car Co., Dayton, O.; DeLux Motor Car Co., Detroit, Mich.; Dolson Automobile Co., Charlotte, Mich.; Dragon Motor Co., Philadelphia, Pa.; Dorris Motor Car Co., St. Louis, Mo.; Evansville Automobile Co., Evansville, Ind.; Ford Motor Company, Detroit, Mich.; Gaeth Automobile Works, Cleveland, O.; Gearless Transmission Co., Rochester, N. Y.; Imperial Motor Car Co., Williamsport, Pa.; Jackson Automobile Co., Jackson, Mich.; Mack Bros. Motor Car Co., Allentown, Pa.; Marion Motor Car Co., Indianapolis, Ind.; Maxwell-Briscoe Motor Co., Tarrytown, N. Y.; Mitchell Motor Car Co., Racine, Wis.; Moline Automobile Co., East Moline, Ill.; Moon Motor Car Co., St. Louis, Mo.; Mora Motor Car Co., Newark, N. Y.; Motorcar Co., Detroit, Mich.; National Motor Vehicle Co., Indianapolis, Ind.; New York Car & Truck Co., Kingston, N. Y.; Nordyke & Marmon Co., Indianapolis, Ind.; Overland Auto Co., Indianapolis, Ind.; Pennsylvania Auto-Motor Co., Bryn Mawr, Pa.; Pierce Engine Co., Racine, Wis.; Premier Motor Mfg. Co., Indianapolis, Ind.; Pullman Motor Car Co., Chicago, Ill.; Rapid Motor Vehicle Co., Pontiac, Mich.; Reliance Motor Car Co., Detroit, Mich.; Reo Motor Car Co., Lansing, Mich.; Simplex Motor Car Co., Mishawaka, Ind.; St. Louis Car Co. (auto dept.), St. Louis, Mo.; Wayne Automobile Co., Detroit, Mich.; Welch Motor Car Co., Pontiac, Mich.; York Motor Car Co., York, Pa.

American Motor & Cycle Co.—Battle Creek, Mich. (Buick, Franklin.)

American Motor Car & Sales Co.—2230 Broadway, New York City. Sales and Advt. Mgrs. American Motor Car Co., Indianapolis, Ind.

American Motor Co.—Brockton, Mass. Mfrs. motorcycles.

American Motordrome, Inc., The.—Land Title Bldg., Philadelphia, Pa. A corporation established to build a motordrome or automobile race track just outside of Philadelphia. Cap., \$500,000.

American Motor League.—Vanderbilt Building, 132 Nassau St., New York City. Isaac B. Potter, Pres.; Chas. E. Duryea, 1st Vice-Pres.; John A. Hawkins, 2nd Vice-Pres.; Henry Chandlee, 3rd Vice-Pres.; Robert O. Brockway, Sec.; Fred B. Hill, Treas. Organized October, 1895, reorganized February, 1902. Object, "to promote the interests of all users of motor-vehicles; to ascertain, protect and defend their rights; to oppose and pre-

vent the enactment of unreasonable and oppressive laws; to encourage the use and improvement of motor-vehicles by investigation, agitation and instruction; to provide its members with printed routes, maps and guide-books by which touring may be facilitated and encouraged; to promote the work of improving the public roads and the erection of proper guide-boards, and other signs, necessary to guide and warn the users of motor vehicles; to select and appoint official hotels, repair shops, storage and supply stations where its members may obtain reliable service at reasonable rates." Chairmen of committees: Road Improvement, R. D. Chapin. Technics, C. E. Duryea. Membership, W. K. Cowan. Legislation, George R. Bidwell. Touring, L. A. Voorhees. Rules and Regulations, C. A. Duchorme. Local Organization, Charles F. Potter. Former Presidents, Charles E. Duryea, Edwin F. Brown.

American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill. Mfrs. carbureters, exhaust horns, lamp brackets, oil cups, oil guns, wind shields (glass), tire holders, muffler cutout valves, gasoline strainers.

American Motor Truck Co.—Caledonia St., Lockport, N. Y. Makers of the "American" 3 and 5 ton trucks. Chas. R. Bishop, Pres.; H. C. Eddy, Vice-Pres.; Robt. Hall, Sec.; H. J. Babcock, Treas.; A. L. Lerch, Mgr. of Sales; E. Bunce, Supt.; H. C. Eddy, Western Sales Mgr., 1334 Monadnock Bldg., Chicago, Ill.

American Oak Leather Co.—176 South St., Boston, Mass. Mfrs. leather.

American Oak Leather Co.—Kenner St. and Dalton Ave., Cincinnati, Ohio. Mfrs. enamel leather for trimming automobiles. Cap. \$7,500,000. Est. 1881. J. E. Mooney, Pres.; Aug. Fabel, 1st Vice-Pres. and Treas.; H. H. Bechtel, 2nd Vice-Pres. and Sec.; C. L. Harrison, 3rd Vice-Pres.; J. F. Taylor, Asst. Sec. and Treas.; Frank Monk, Supt.

American Oil Co.—170-178 So. Water St., Jackson, Mich. Mfrs. oils, greases and compounds, varnish soap. Cap. \$10,000. Est. Jan. 1, 1904. Robert Campbell, Pres.; John W. Shove, Vice-Pres.; Fred H. Helmer, Treas.; A. J. Callaghan, Sec. and Gen. Mgr.

American Pin Co.—Waterbury, Conn. Mfrs. brass, bronze, aluminum and copper castings.

American Platinum Works.—251 N. J. R. R. Ave., Newark, N. J. Mfrs. platinum, sparking points.

American Portable House Co.—Seattle, Wash. Mfrs. portable houses and garages.

American Roller Bearing Co.—Tripp

St., So. Framingham, Mass. Mfrs. roller bearings for transmissions, axles, countershafts, etc. Also builders of front and rear axles on contract. Member M. & A. M. Cap. \$325,000. Est. 1899. Frederick B. Hill, Sec., Treas. and Gen. Mgr.; K. Franklin Peterson, 166 Lake St., Chicago, Western Factory Representative.

American Sheet Iron Co.—Phillipsburg, N. J. Mfrs. sheet iron and steel.

American Sheet Steel Co.—24 State St., New York City. Mfrs. sheet iron and steel.

American Society of Civil Engineers.—(Proceedings), pub. monthly. 320 W. 57th St., New York City.

American Society of Mechanical Engineers.—(Transactions), pub. monthly. 25 W. 39th St., New York City.

American Steam Gauge & Valve Co.—220 Camden St., Boston, Mass. Mfrs. steam and air gauges, pop safety valves. Est. 1851. R. B. Phillips, Treas. and Gen. Mgr.; H. B. Nickerson, Sec.; Gardner Cornett, Vice-Pres.; John McCandlish, Pres.

American Steam Packing Co.—Boston, Mass. Mfrs. packing.

American Steam Pump Co.—Battle Creek, Mich. Mfrs. air compressors; fuel, air and boiler pumps.

American Steel & Wire Co.—The Rookery, Chicago, Ill. Mfrs. steel shafting, insulated wire, sheet iron and steel, machinery springs.

American Steel Barrel Co.—204-6 Varet St., Brooklyn, N. Y. Mfrs. tool boxes, gasoline tank gauges, storage tanks.

American Steel Castings Co.—Chester, Pa. Mfrs. steel castings.

American Steel Hoop Co.—Pittsburg, Pa. Mfrs. angle, channel and tee iron and steel; bar iron and steel.

American Steel Wool Co.—451-3 Greenwich St., New York City. Mfrs. steel wool.

American Thermo-ware Co.—16 Warren St., New York City. Mfrs. eye shields, hydrometers.

American Thread Co.—Boston, Mass. Mfrs. thread (top and upholstery).

American Tire Co.—Owosso, Mich. Mfrs. anti-skid devices, tire treads, tires (leather).

American Top Co.—Jackson, Mich. Mfrs. tops (auto).

American Tube & Stamping Co.—Bridgeport, Conn. Mfrs. channels, oil cans, rims (steel), tubing (steel).

American Tube Works.—137 Milk St., Boston, Mass. Mfrs. tubing (brass and copper).

American Vanadium Co.—Frick Bldg., Pittsburg, Pa. Metals (Vanadium).

American Veneer Co.—Kenilworth,

N. J. Mfrs. laminated wood automobile mud guards and dash boards. Est. 1900. Wm. A. Bushfield, Pres. and Mgr.; Wm. H. Bushfield, Sec.; F. T. Perrine, Sales Mgr.

American Wood Rim Co.—Bradford, Pa. Mfrs. rims (wood), steering wheels.

American Yacht & Motor Co.—Cherokee and De Kalb Sts., St. Louis, Mo. Mfrs. motor boats.

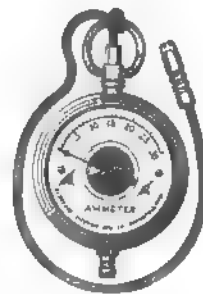
Ames, C. B.—Adv. Mgr. Motor, 2 Duane St., New York City.

Amesbury Brass & Foundry Co.—Amesbury, Mass. Mfrs. bow separators castings (brass, bronze, aluminum and copper), seats (auto), top fixtures, trimmings (metal).

Amesbury Metal Body Co.—Cor. Clarke and Elm Sts., Amesbury, Mass. Mfrs. aluminum, iron and steel bodies. Est. April 1, 1907.

Amico dell Automobili, L.—Published at 19 rue Maria Vittoria, Turin, Italy.

Amidon, L. H.—Wheaton, Minn. (Waltham.)



Ammeter or Amperemeter.—A galvanometer graduated so that when inserted in a circuit its index reads directly on a scale the number of amperes flowing through a coil.

Ammonia.—A colorless gas (NH_3) with a characteristic smell. It is used in the form of an aqueous solution. A bottle of it should be kept close at hand by the automobilist when handling battery acid, and the ammonia be liberally applied to whatever the acid touches. The result will be a permanent disappearance of the red stains.

Ammonia Hydrochlorate.—A white salt of ammonia (NH_4Cl), very soluble in water and employed as a chemical reagent. Under the common name of "sal ammoniac," it is much used for cleaning soldering irons before using them, and is one of the principal constituents of dry batteries.

Amos Pierce Auto Co.—109 State St., Syracuse, N. Y. (Peerless, Stevens-Duryea.) Repairing.

Amoudruz, A.—24 rue d'Armaillé Paris, France. Mfrs. carburetters, pumps, tire pumps, circulating pumps, radiators.

Amperage.—The amount of current which can be carried by a given conductor. It varies with the conditions of ventilation and other factors which affect the cooling of the conductor.

Ampere.—The practical unit of electricity by which the intensity of a cur-

rent traversing a circuit is measured. The ampere is the intensity of the current flowing through a circuit of which the resistance is one ohm, when the difference of potential at the terminals of such circuit is one volt. It is also the intensity of the current necessary, in an electrolytic bath, to furnish a deposit of 1.118 milligramme of silver in one second. The number of amperes is measured by interposing an amperemeter in the circuit.

Ampere Hour.—The electrical unit signifying a current of electricity having a volume of one ampere flowing continuously for one hour. It is used to measure the capacity of accumulators.

Ampere Mfg. Co.—408-12 W. 13th St., New York City. Mfrs. dry batteries.

Ampere Turns.—The product of the number of turns in a coil and the number of amperes flowing through it.

Amy's Patent.—3 rue du Pas-de-la-Mule, Paris, France. Mfrs. shock absorbers.

Anchor.—A large five-armed grapnel attached to the balloon-ring by a rope from a hundred to a hundred and twenty feet in length. When the balloon is in the air the anchor is arranged so as to hang below it, and, when a descent is made, it is the first thing to touch the ground. ((2). A heavy iron instrument for retaining a vessel in place.

Anders & Van Heck.—Stevens Point, Wis. (Rambler.)

Anderson & Co., F. W.—Philadelphia, Pa. Office, 729 So. Broad St.; Factory 757 No. Uber St. Mfrs. auto tops, slip covers, tire cases, baggage racks, body upholstering and painting, auto iron and steel work, top envelopes, extra tonneau seat. Est. Dec., 1905. F. M. Anderson, Pres.; Jos. W. Anderson, Treas.

Anderson & Wilkens.—125 W. 49th St., New York City. Repairing.

Anderson, A. G.—Supt. of factory, Worcester Pressed Steel Co., 1064 Monadnock Block, Chicago, Ill.

Anderson Auto Co.—314 4th Ave., N., Nashville, Tenn. Garage.

Anderson Auto Co.—41 Downer Pl., Aurora, Ill. (Rambler, White); garage; repairing; supplies.

Anderson Automobile Co.—Anderson, S. C. Garage.

Anderson Bros.—117 Front St., Marietta, Ohio. (Buick.)

Anderson, E. L.—Chief Engineer, Waterman Marine Motor Co., 1506-12 Fort St. West, Detroit, Mich.

Anderson, Carl.—Pres. Anderson Engine Co., Shelbyville, Ill.

Anderson, D. C.—Part owner Edgeworth Machine Co., Meadow Road, Edgeworth, Pa.

Anderson Carriage Co.—Detroit, Mich. Mfrs. automobiles, gas.

Anderson Engine Co.—Shelbyville, Ill. Mfrs. gasoline engines (automobile and marine). Cap. \$30,000. Est. 1905. Carl Anderson, Pres.; W. C. Anderson, Sec. and Treas. Branches at 19 E. Huron St., Chicago, Ill.; 82 Warren St., New York; 420 No. Main St., St. Louis, Mo.; 500 Washington St., Buffalo, N. Y.

Anderson Forge & Machine Co.—Detroit, Mich. Mfrs. connecting rods, crank shafts, drop forgings.

Anderson, F. W.—467 Madison Ave., Albany, N. Y. (Indian.)

Anderson, F. W.—Pres. F. W. Anderson & Co., Philadelphia, Pa. Office, 729 So. Broad St.; factory, 757 No. Uber St.

Anderson, G. A.—Vice-Pres. D. W. Haydock Automobile Mfg. Co., 5975 Cote Brilliant Ave., St. Louis, Mo.

Anderson, H. B.—Engineer, Winton Motor Carriage Co., Cleveland, O.

Anderson, Howard S.—Head of carriage carpets, worsted, wool and jute depts., Schofield, Mason & Co., Fairhill, Reese and Cumberland Sts., Philadelphia, Pa.

Anderson, H. N.—Asst. Supt. Dayton Motor Car Co., Dayton, O.

Anderson, J. D.—Pres. Hartford Rubber Works Co., Hartford, Conn., and of The G. & J. Tire Co., Indianapolis, Ind.

Anderson, Jos. W.—Treas. F. W. Anderson & Co. Office, 729 So. Broad St.; factory, 757 No. Uber St., Philadelphia, Pa.

Anderson L. R.—Part owner Edgeworth Machine Co., Meadow Road, Edgeworth, Pa.

Anderson, Ross.—Supt. Matheson Motor Car Co., Wilkesbarre, Pa.

Anderson, W. C.—Sec. and Treas. Anderson Engine Co., Shelbyville, Ill.

Anderson, W. F.—7th and Harrison Sts., San Francisco, Cal. (Reliance.)

Andress, H. M.—635 W. Broad St., Elyria, Ohio. (Queen.) Est. 1906.

Andrews & Fite.—Georgetown, Ohio. (Jewel.)

Andrews, Miss Anna M.—Treas. Chicago Women's Motor Club, Chicago, Ill.

Andrews, Chas. A.—Winchendon, Mass. (Reo, Jackson, American Mercedes.)

Andrews, C. L.—Factory Supt. General Mfg. Co., Elkhart, Ind.

Andrews, George.—437 Pearl St., Buffalo, N. Y. Garage.

Andrews, J. D.—Vice-Pres. Hamilton Motor Car Co., 26 No. 2nd St., Hamilton, Ohio.

Andrews, Rolland B.—Leominster, Mass. (Rambler.)

Andrews, Dr. W. W.—Phillipsburg, Pa. (Cadillac.)

Aneroid.—A portable form of barometer which does not involve the use of a long column of fluid, and hence is invaluable for aeronauts in determining the altitude reached by a balloon. A good aneroid barometer is desirable also when long cruises are to be made on a motorboat, the instrument often giving warning of squalls and severe storms before they approach.

Angelii, Giovanni.—Man. Director. Fiat Automobile Co., Turin, Italy.

Angelus Motor Car Co.—110 E. 3rd St., Los Angeles, Cal. Garage.

Anglada.—Puerto de Santa Maria, Cadiz, Spain. Mfrs. automobiles, gas.

Angle Iron.—See Iron, angle.

Angle Steel.—See Steel, angle.

Anglian Motor Co., Ltd.—Beccles, Suffolk, England. Mfrs. automobiles, gas. (Anglian cars), differential gears, tricar (Anglian quads).

Angrove Bros.—88-90 Princess St., Kingston, Ont., Can. (Russell, Oldsmobile.)

Anhaltische Fahrzeugwerkstaette Krause.—Dessau, Germany. Mfr. jacks.

Anion.—A free atom, or group of atoms, in a solution, which travels toward the anode (see Anode) when the solution is subject to electrolysis.

Annales Techniques, Les.—Published at 52 rue Saint Georges, Paris, France.

Annealing.—A process of increasing the softness and toughness of a material by allowing it to cool slowly after heating. Metals, after much hammering or repeated shocks, become brittle, and their toughness can generally be restored by annealing. In like manner glass, after being worked in a hot state, is very brittle, and requires annealing. Steel articles may be most effectually softened by imbedding them in a mixture of charcoal and chalk and exposing them to a high heat.

Annett's Garage.—15-17 Harper St., Detroit, Mich. Garage.

Annis Oil Co., N. L.—139 Potomac Ave., Buffalo, N. Y. Mfrs. grease, oils, soaps (auto body).

Anniston Hdwe. Co.—1118 Noble St., Anniston, Ala. (Buick.)

Annuaire de la Carrosserie et de l'Automobile.—Year book of coach and automobile construction, 14 rue Lafayette, Paris, France.

Annuaire de la Traction Automobile.—(Directory.) 138 rue Amelot, Paris, France.

Annuaire Général de L'Automobile.—(Automobile Directory.) 38 bis, avenue de la Grande-Armée, Paris, France.

Annual Baudry de Saunier.—Year Book. 20 rue Duret, Paris, France.

Annunciator.—An electrical device for communicating with the driver from the interior of an automobile. The pressure of a button inside the vehicle instantly calls the driver's attention by ringing a bell and illuminating the proper corresponding signal word on the glass face of an external disc.

Anode.—The plate or piece of metal in a battery-cell by which the current enters the liquid. The term also designates the positive pole of a battery or accumulator. It is indicated by the sign + or by the red color of the terminals.

Ansaldi-Cierano.—Daniera Crocetta, Milan, Italy. Mfrs. automobiles, gas. (S. P. A.)

Ansonia Auto Co.—235 W. 69th St., New York City. Garage.

Ansonia Brass & Copper Co.—99 John St., New York City. Mfrs. brass and copper (sheet and rod), metals (brass, copper and bronze), tubing (brass and copper).

Ansonia Electrical Co.—Ansonia, Conn. Mfrs. bells.

Ansted Spring & Axle Co.—Connersville, Ind. Mfrs. springs (leaf).

Ansted, W. B.—Pres. Central Mfg. Co., Connersville, Ind.

Anthony, Chas. E.—Pres. Western Motor Car Co., Los Angeles, Cal.

Anthony, Chas. S.—112 E. 9th St., Los Angeles, Cal. (Federal.)

Anthony, Earl C.—Vice-Pres. and Asst. Mgr. Western Motor Car Co., Los Angeles, Cal.

Anthony, E. A.—Sec. Carlow Auto. Co., 51-59 Weir St., Taunton, Mass.

Anthony, H. K.—Sec. and Treas. Western Motor Car Co., Los Angeles, Cal.

Anthony, R. S.—Fresno, Cal. (Jewel.)

Anthony, Wm.—Pres. Sterling Mfg. Co., 416 American Trust Bldg., Cleveland, O.

Anthony Auto Garage.—253 Reid Ave., Brooklyn, N. Y. Garage.

Anti-Freezing Solutions.—Any liquid of low freezing point suitable for use in the cooling system of a water-cooled motor. The following have been recommended: (1) a mixture of glycerine and water in the proportion, by weight, of 25 per cent. of the former to 70 of the latter, to which is added 2 per cent. of sodium carbonate; (2) chemically pure calcium chloride, dissolved in hot water, in the proportion of 4 pounds to 1 gallon of water; (3) sodium chloride (kitchen salt) or magnesium chloride, dissolved in water, in the proportion of 1½ pound or 2 pounds to the gallon; (4) a mixture of wood alcohol and water, the percentage of which will depend upon the climatic conditions to which the car is exposed. A 15 per cent. solu-

tion will prevent freezing at a temperature of 15° above zero. A 40 per cent. solution will not freeze at 25° below zero. The advantage of this mixture is that it has no injurious action on either metal or rubber.

Antimony.—An important metal found chiefly in the state of sulphide. It is extracted mostly from "stibnite." It has a bluish-white color and strong luster; possesses a distinct crystalline platy structure; is extremely brittle, and is reduced to powder with the greatest ease. Its specific gravity is 6.8, and it melts at a temperature just short of redness (842° F. or 450° C.).

It is of the greatest importance in the arts, and, in combination with lead, forms "type metal." "Britannia metal" is an alloy of 9 parts of tin, and 1 part of antimony, frequently also containing small quantities of copper, zinc or bismuth. An alloy of 12 parts of tin, 2 parts of antimony and a small quantity of copper forms a superior kind of "pewter." Alloys of antimony with tin, or tin and lead are much used for the manufacture of anti-friction bearings for machinery.

Anti-skid.—See Non-skid.

Antony Motor & Mfg. Co.—Colorado Springs, Colo. Mfrs. motorcycles.

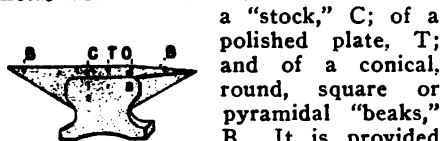
Antiderapatant Rittier.—167 bis, rue de Courcelles, Levallois-Perret, France. Mfr. non-skids.

Antler Stable & Garage Co.—Toledo, Ohio. Garage.

Antoinette, Société.—10 rue des Bas-Rogers, Puteaux, France. Mfrs. motors, aeronautic and automobile.

Antoine fils et Cie.—41 quai St. Leonard, Liège, Belgium. Mfrs. motors (auto), (Antoine motors); motors, (motorcycle); motorcycles (Antoine.)

Anvil.—A heavy block of wrought iron faced with hard steel on which metal work is hammered. It consists of



a "stock," C; of a polished plate, T; and of a conical, round, square or pyramidal "beaks," B. It is provided also with a square aperture, O, used for holding the accessory tools for making holes. It is placed on a block of wood called a "bed."

(2) The term "anvil" is applied also, in a make-and-break system of ignition, to a fixed insulated steel electrode against which a movable electrode called a "hammer" strikes and, through its contact, momentarily closes an electric circuit.

Apgar, M. H.—Summit, N. J. (Maxwell.)

Apparatebau-Anstalt Fischer.—Frank-

fort-Oberrad, Germany. Mfrs. magnetos (high tension).

Appelby, Ltd., Jos.—Birmingham, England. Mfrs. chains.

Apperson Bros. Automobile Co.—80 So. Main St., Kokomo, Ind. Makers of Apperson car. Elmer Apperson, Owner and Gen. Mgr.; A. G. Seiberling, Asst. Gen. Mgr. and Pur. Agt.; Edgar Apperson, Designer; Chas. Felske, Supt.; Geo. F. Ramer, Asst. Pur. Agt.; Geo. H. Strout, Sales Mgr. and Advt. Mgr. Agents: Jos. F. Gunther Co., 1240 Michigan Ave., Chicago, Ill.; Sidney B. Bowman Auto Co., 225 W. 49th St., New York City; John E. Fry, 1562 Broadway, Denver, Colo.; Howard Auto Co., 404 Golden Gate Ave., San Francisco, Cal.; Diamond Motor Car Co., Los Angeles, Cal.

Apperson, Edgar.—Designer, Apperson Bros. Automobile Co., Kokomo, Ind.

Apperson, Elmer.—Owner and Gen. Mgr. Apperson Bros. Automobile Co., Kokomo, Ind.

Appleby & Dill.—Spotwood, N. J. (Maxwell.)

Appliance Mfg. Co.—72-86 W. Jackson Blvd., Chicago, Ill. Mfrs. bumpers, horns, foot rests, robe rails, tire holders.

Apprin, P.—15 rue David, Lyon, France. Mfr. radiators.

Aprile, Rossi E. Cia.—3 via Luitprando, Pavia, Italy. Mfrs. motorcycles.

Apron.—A canvas, enamel cloth, rubber, or metal cover for the under side of the mechanism of a motor car to protect it against dirt. Called also a "dust apron," and, when of metal, a "pan."

Apron, Storm.—A waterproof cloth for protecting the occupants of a vehicle from rain. A variety containing head-openings which can be closed and the apron used as a vehicle cover is called a "cape apron."

Apstein, D.—Bridgeport, Conn. Mfr. tire plugs.

Aquafortis.—See Acid, Nitric.

Aquascutum, Ltd.—100 Regent St., London W., England. Wearing apparel (coats).

Aquila, Fabbrica Italiana di Automobili.—9 via Bonsignore, Turin, Italy. Mfrs. automobiles, gas. (Aquila); motors, (auto) (Aquila motors).

Arbenz und Co., Eugene.—17 Wolfbach Strasse, Zürich, Switzerland. Mfrs. automobiles, gas. commercial. (Arbenz.)

Arbor.—A general term for an axle or shaft, especially the principle one in a machine.

Arcade Machine Works.—New Milford, Conn. Garage.

Arcade Malleable Iron Co.—Worces-

ter, Mass. Mfrs. castings (malleable iron), castings (steel).

Archer & Co.—1597 Broadway, New York City. Importers, Hotchkiss car. Est. Oct. 1, 1905. Cap. \$10,000. A. M. Archer, Pres.; J. W. DeLamater, Vice-Pres.; C. T. Balcom, Sec. and Treas. Branch: M. B. Kent, 141 Massachusetts Ave., Boston, Mass. Repairing.

Archer Auto Tire Co., The.—548 W. Center St., Marion, Ohio. Mfrs. tires (cushion).

Archer, A. M.—Pres. Archer & Co., 1597 Broadway, New York City.

Archer, Chas. A.—Sec. Locke Regulator Co., 76 North St., Salem, Mass.

Archer, Wesley R.—78 West St., New Haven, Conn. Repairing.

Archibald Wheel Co.—Lawrence, Mass. Mfrs. wheels (wood).

Arc Spark Mfg. Co.—125 W. 32nd St., New York City. Mfrs. spark plugs.

Arc Toledo Spark Plug Co.—Toledo, O. Mfrs. spark plugs.

Arentsen and Kolling.—Dieren, Holland. Mfrs. motorcycles.

Areometer.—An apparatus for measuring the density of a liquid. See Hydrometer.

Argus Chenu.—10 rue Fontaine-St. Georges, Paris, France. Mfrs. motors (auto).

Argus Import Motor Co.—17 E. 34th St., New York, N. Y. Importers Argus cars.

Argus Motoren Gesellschaft, Jeannin und Co.—Prinz Luis-Ferdinand-strasse 1, Berlin, Germany. Mfrs. motors (auto); automobiles, gas. (Argus.)

Argyll Motors, Ltd.—Glasgow, Scotland. Mfrs. automobiles, gas. (Argyll.)

Ariel Motor Co., Ltd.—133 Long Acre London, England. Mfrs. automobiles, gas. (Ariel.)

Ariel Motors, Ltd.—101 New Bond St., London W., England. Mfrs. motorcycle motors.

Ariel Works.—Bournebrook, Birmingham, England. Mfrs. motorcycles (Ariel).

Aries, Société Anonyme des Automobiles.—39 quai d'Argenteuil, Villeneuve-la-Garenne, France. Mfrs. automobiles, gas. (Aries.)

Arion Automobile Co.—161 Commerce St., New Haven, Conn. Garage.

Arion Garage, Inc.—485 Park Ave., New York City. Garage.

Arizona Auto Co.—Phoenix, Ariz. Garage.

Arkansas Automobile Co.—Little Rock, Ark. (Cadillac, Oldsmobile.)

Arlington Co., The.—473-5 Broadway, New York City. Mfrs. celluloid sheets.

Arlington Motor Car Co.—Pittsburg, Pa. (Jackson, Acme.) Est. 1905. Chas. F. McLaughlin, Pres.; Jas. F. McLaugh-

lin, Sec. and Treas. Garage, 38 cars. Repairing.

Arm.—Anything branching out like an arm from the main body; of a gear-wheel, one of the spokes; of a motor-vehicle, that part of the axle which passes through the hub—the "spindle;" one of the lugs that support a motor-case from the sub-frame; one of the projecting members of an anchor; ending in a fluke; one of the wings of an angle-iron, etc.

Armac Motor Co.—472-8 Carroll Ave., Chicago, Ill. Mfrs. motorcycles, motors (gas. auto.) Garage.

Armature.—(1) The piece of soft iron which is placed in contact with the poles of a permanent magnet to prevent the gradual loss of its magnetism (Fig. 1 a); called also a "keeper." (2) A piece of soft iron on which a magnet acts by magnetic attraction in order to actuate some piece of electrical apparatus, such as a relay. (3) The part of a dynamo or magneto (Fig. 2a) which is submitted to the influence of the magnetic field developed by the inductor. As a consequence of phenomena of induction, there is created in the armature windings an electromotive force which generates the utilizable electric current. Armatures may be divided into four main types: (1) ring armatures; (2) drum armatures; (3) pole armatures; and (4) disk armatures.

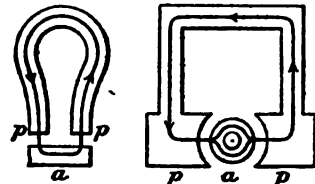


Fig. 1.

Fig. 2.

In all dynamos or continuous-current motors the inductor is stationary and the armature movable. In alternators or alternating-current motors an exactly opposite arrangement is frequently employed, the inductor revolving and the armature being stationary.

In 1856 Werner Siemens devised an improved armature, in which the coils of wire were wound shuttle-wise upon a grooved iron core which concentrated the magnetic lines in a powerful field between the poles of a series of adjacent steel magnets. This is called the "Siemens H," or "Shuttle" type, and is the simplest form of wire-wound armature known. The "Slotted" type of armature has a more intricate system of winding than the shuttle type, but has a far greater electrical efficiency and gives off a steadier current. It is the form most generally used for automobile and street railway motors. The current generated

by both types is alternating and is converted into a direct current by means of a commutator of very complicated form.

Armbruster, S.—4 Porzellengasse, Vienna, Austria. Mfrs. bodies.

Armes, Cycles et Automobiles, Société Manufacturière d'.—rue Trefilerie, St. Etienne, France. Mfrs. automobiles, gas. (Svelte.)

Armes de Guerre, Fabrique Nationale d'.—Herstal-les-Liege, Belgium. Mfrs. automobiles, gas.

Armitage & Co., John L.—Newark, N. J. Mfrs. varnishes.

Armory Garage.—Franklin St., Lynn, Mass. (Jackson.)

Armour & Co.—Chicago, Ill. Mfrs. hair (curled).

Armstrong, Calvin R.—Lock Haven, Pa. (Pope-Toledo, Franklin, Buick, Cadillac.)

Armstrong & Co., M.—433 Chapel St., New Haven, Conn. Mfrs. bodies (wood and metallic).

Armstrong & Sons.—Maryville, Ohio. Garage.

Armstrong Bros. Tool Co.—104-124 No. Francisco Ave., Chicago, Ill. Mfrs. tools.

Armstrong Cork Co.—23rd St. and A. V. Ry., Pittsburg, Pa. Mfrs. carburetter floats (cork); washers.

Armstrong & Hunter.—356 13th St., Brooklyn, N. Y. Garage.

Armstrong Mfg. Co., The J. B.—Flint, Mich. Mfrs. springs (leaf).

Armstrong, Whitworth & Co., Ltd.—Great Peter St., Westminster, London, England. Mfrs. automobiles, gas. (Armstrong-Whitworth.)

Army Cycle Mfg. Co.—130-32 Meeting St., Charleston, S. C. (Cadillac, Buick.) Est. 1896. Cap. \$5,000. J. H. Rast, Pres., Treas. and Mgr.; W. E. Hughes, Sec. Garage, 25 cars. Fully equipped shop for repairing.

Arnold, E. L.—San Juan, Porto Rico. Garage.

Arnold, T. N.—Haverhill, Mass. (Premier.)

Arnold, W. H.—Bangor, N. Y. Garage.

Arnstein, Eugene.—45th and Shields Ave., Chicago, Ill. Supply house.

Arrison, W. D.—Vice-Pres. Carter Motor Car Corp., 409-10 Munsey Bldg., Washington, D. C.

Arrol Johnston Car Co., Ltd., The New.—Underwood, Paisley, Scotland. Mfrs. automobiles, gas. (Arrol Johnston.)

Arthur & Flessel.—53 Main St., Huntington, N. Y. (Waltham, Peerless.) Est. 1898. Garage, 3 cars. Repairing.

Arthur Co., The.—188 Front St., New York City. Mfrs. gear wheels (metal).

Artizan Brass Co.—204 Lincoln Park

Blvd., Chicago, Ill. Mfrs. tire pumps, valves (safety).

Artman, James.—Pres. and Editor Cycle and Automobile Trade Journal, 1213 Filbert St., Philadelphia, Pa.

Art Metal Construction Co.—Jamestown, N. Y. Mfrs. lockers.

Artzbarger, W. H.—Milroy Ave., Allegheny, Pa. (Model.)

Artz, J. D.—Sole owner Dayton Folding Tonneau Co., 1141 No. Main St., Dayton, Ohio.

Arverne Automobile Garage.—Arverne, N. Y. (Glide.)

Asay, J. E.—Rock Island, Ill. (Jewell.)

Asbestos.—A fibrous mineral, a double silicate of calcium and magnesium, very incombustible, and a non-conductor of heat. It is manufactured into cardboard and cord and used for making joints in pipes and parts of machinery where great heat is developed. It is also extensively used for "lagging" (covering) for steam and hot-water pipes where it is desired to prevent condensation and loss of heat. "Asbestos wick packing" is a packing composed of selected asbestos fiber, spun into strands and made into the form of a soft, strong lamp-wick, which may be wound and packed in any desired shape.

Asbestos Mfg. Co.—Philadelphia, Pa. Mfrs. asbestos.

Asch, A. C.—Vice-Pres. Toledo Storage Battery Co., 102 Oliver St., Toledo, O.

Aschaffenburg Co., Ltd.—821 Barrow St., New Orleans, La. Garage.

Aschenburg, Wm.—Madison Ave., Perth Amboy, N. J. Garage.

Ashbrook, H. D.—Mgr. Japalac Dept. Glidden Varnish Co., Rockefeller Bldg., Cleveland, O.

Ashcroft Mfg. Co.—87 Liberty St., New York City. Mfrs. gauges pressure.

Ash, Edward.—Foreman, Pope Automobile Co. of Washington, 817-819 14th St., Washington, D. C.

Asher, H. W.—Vice-Pres. New Haven Button Co., New Haven, Conn.

Asher, W. J.—Main St., Willimantic, Conn. (Rambler.)

Asheville Cycle & Auto Co.—15-17 Lexington Ave. and 18-20 Church St., Asheville, N. C. (Cadillac, Knox.) Est. 1894. E. C. Sawyer, Prop. and Mgr. Garage, 10,000 ft. floor space. Repairing.

Asheville Mica Co.—Asheville, N. C. Mfrs. and dealers of mica (sheet or cut), washers, discs. Est. 1899.

Ashland Automobile Club.—301 Second St. E. (Knight Hotel), Ashland, Wis. Pres., W. T. Rhienhart; Sec. and Treas., B. Maytor Hoppenyan. Organized July 1, 1907, to "secure the building and repairing of roads and promote club

runs for amusement of members." Chairmen of Committees: C. H. Ziehlsdorff, Counsel; J. M. Dodd, Road; C. M. Cushman, Carnival. Charter Members: W. T. Rheinhardt, J. M. Dodd, E. M. George, G. T. Sanborn, C. H. Ziehlsdorff, S. M. Cushman, B. Maytor Hoppenyan. Held race carnival, Sept., 1907. Present membership, 19.

Ashland Auto Garage.—87 Ashland Blvd., Chicago, Ill. (Auburn, Meiselbach.)

Ashley Machine Works.—714 University Ave., Rochester, N. Y. Machine work (to order), mfrs. steering apparatus, universal joints.

Ashley, W. G.—Olympia, Wash. (Indian.)

Ashtabula Carriage Bow Co.—99 Prospect St., Ashtabula, O. Mfrs. bow sockets.

Ashtabula Hide & Leather Co.—Ashtabula, O. Mfrs. leather.

Ashton, Albert C.—Sec. and Treas. Ashton Valve Co., 271 Franklin St., Boston, Mass.

Ashton Valve Co.—271 Franklin St., Boston, Mass. Mfrs. pop safety valves, pressure gauges, water gauges, gauge cocks. Cap. \$150,000. Est. 1871. John Avery, Pres.; Fred A. Carey, Vice-Pres.; Albert C. Ashton, Sec. and Treas.

Ashwell, Robt.—45 Vine St., Hartford, Conn. (Franklin.)

Asphalt or Asphaltum.—Called also "mineral pitch," "compact bitumen" and "Jew's pitch;" a substance occurring abundantly in many parts of the world, as in the neighborhood of Dead Sea in Judea and in Trinidad, in the famous Pitch Lake, and elsewhere. It resembles, in general aspect, common pitch, is easily melted, very inflammable, and burns with a red, smoky flame. It consists principally of a substance called "asphaltene," composed of $C_{20}H_{32}O_3$.

Mixed with a percentage of sand or other substances, it is much used as a paving material.

Aspenwall Hotel Co.—Lenox, Mass. Garage.

Aspirating Nozzle.—See Nozzle, Spray.

Assemble.—To fit or join together, as the parts of a machine.

Associated Automobile Clubs of New Jersey.—Trenton, N. J. Composed of clubs affiliated with the A. A. A. W. F. Sadler, Jr., Sec., Trenton, N. J.; Winthrop E. Scaritt, 1st Vice-Pres., East Orange, N. J.; George A. Post, 2nd Vice-Pres., Paterson, N. J.; Frank Eveland, Treas., 51 Madison Ave., Jersey City, N. J.; J. E. Gill, Sec., 10 South Broad St., Trenton, N. J. The membership is composed of the following: Atlantic City Automobile Club, Automobile Club of Hudson Co., Automobile Club of New Jersey, Cape May Automobile Club,

Mercer County Automobile Club, Monmouth Automobile Club, Motor Club of Wildwood, New Jersey Automobile and Motor Club, North Jersey Auto Club, Union County Automobile Association.

Association of Licensed Automobile Manufacturers.—7 East 42nd St., New York City. Charles Clifton, Pres. (George N. Pierce Co.); Thomas Henderson, Vice-Pres. (Winton Motor Carriage Co.); L. H. Kittredge, Sec. (Peerless Motor Car Co.); H. H. Franklin, Treas. (H. H. Franklin Co.); Milton J. Budlong, Gen. Mgr.

Organized in 1903, its objects being "primarily to protect the rights of its members and those of the dealers and users of cars manufactured under the fundamental patent on gasoline automobiles, known as the Selden patent."

At the beginning its membership consisted of a majority of the older and larger concerns, and this membership has been added to from year to year, until to-day it is composed of the following:

Licensees Under Selden Patent No. 549,160: Apperson Bros. Automobile Co., Autocar Co., Buick Motor Co., Cadillac Motor Car Co., Corbin Motor Vehicle Corp., Electric Vehicle Co., Elmore Mfg. Co.; H. H. Franklin Mfg. Co.; Haynes Automobile Co., Hewitt Motor Co., Knox Automobile Co., Locomobile Company of America, Lozier Motor Co., Matheson Motor Car Co., Northern Motor Car Co., Olds Motor Works, Packard Motor Car Co., Peerless Motor Car Co., George N. Pierce Co., Pope Manufacturing Co., Pope Motor Car Co., Royal Motor Car Co., Alden Sampson, 2nd, Selden Motor Vehicle Company, F. B. Stearns Co., Stevens-Duryea Co., Studebaker Automobile Co., E. R. Thomas Motor Co., Walter Automobile Co., Waltham Manufacturing Co., Winton Motor Carriage Co.

In 1905 the National Association of Automobile Manufacturers, the membership of which consisted of both A. L. A. M. and "independent" or "non-licensed" concerns, and which had been conducting the annual shows at Madison Square Garden, announced that it had decided to withdraw from the show field. The A. L. A. M. thereupon contracted with the Madison Square Garden Company for the exclusive use of that building for automobile exhibition purposes, and proceeded to hold shows restricted, so far as gasoline cars were concerned, to its own members. The first of these shows was held in January, 1907, and the second opened November 2, 1907.

The many departments formed by the Association, particularly the mechanical, traffic, agency, foreign and employment, are at the disposal of the members of the

Association, their dealers and patrons, and if a closer recognition of the work of these departments is observed, the Association believes that even greater results than heretofore may be derived.

The Selden patent No. 549,160 was granted to G. B. Selden on November 5th, 1895, the application having been filed May 8th, 1879. The claims of the patent are thus stated briefly:

"A self-propelled vehicle comprising steering wheels and steering mechanism, driving wheels, a liquid hydrocarbon engine of the compression type, the engine shaft running at a speed greater than the driven wheels, and disconnecting means between the engine and the driven wheels, the engine being such as to permit the inclusion in the combination of a body adapted for persons or goods."

"There are six claims in all, and some of the other claims relate to other features of construction. The main claims, summarized as above, cover all the combinations of the elements which have been found essential and which are to-day embodied in one form or another in all so-called gasoline automobiles. The patent will expire November 5th, 1912."

"November 4, 1899, Selden granted an exclusive license under his patent to the Electric Vehicle Company, who instituted suits for infringement shortly thereafter, the main one being against Winton Motor Carriage Co. The latter recognized the validity of the patent and acquired a license March 5th 1903, when ten other leading gasoline vehicle manufacturers acquired similar licenses, and together founded the Association of Licensed Automobile Manufacturers."

Chairmen of Committees: Executive, Charles Clifton; Trade, Wm. E. Metzger; Shows, George Pope; Handbook, L. K. Kittredge. Executive Committee: Thomas Henderson, Winton Motor Carriage Co.; Charles Clifton, Geo. N. Pierce Co.; S. T. Davis, Jr., Locomobile Company of America; Herbert Lloyd, Electric Vehicle Co.; William E. Metzger, Cadillac Motor Car Co. Trades Committee: William E. Metzger, Cadillac Motor Car Co.; George Pope, Pope Manufacturing Co.; H. H. Franklin, H. H. Franklin Manufacturing Co.; C. C. Hildebrand, Stevens-Duryea Co.; Thomas H. Henderson, Winton Motor Carriage Co., H. T. Clinton, Mgr. Committee on Tires: Albert L. Pope, Pope Manufacturing Co.; L. H. Kittredge, Peerless Motor Car Co.; S. D. Waldon, Packard Motor Car Co. Hand Book Committee: L. H. Kittredge, Peerless Motor Car Co.; William E. Metzger, Cadillac Motor Car Co.; Thomas H. Henderson, Winton Motor Carriage Co. Show Committee: George Pope, Pope

Manufacturing Co.; Charles Clifton, George N. Pierce Co.; Merle L. Downs, Sec., A. L. A. M. Traffic Committee: S. D. Waldon, Packard Motor Car Co.; Thomas H. Henderson, Winton Motor Carriage Co.; E. P. Chalfant, Waltham Manufacturing Co. Advertising and Publicity Committee: F. L. Smith, Olds Motor Works; E. R. Thomas, E. R. Thomas Motor Co.; Charles B. Shanks, Winton Motor Carriage Co.; J. A. Kingman, Locomobile Company of America. New York Office; Milton J. Budlong, General Manager. Patent Department, Herman E. Cuntz, Mgr. Traffic Department, James S. Marvin, Mgr. Advertising and Publicity Department, Harry T. Clinton, Mgr. Mechanical Branch: A. L. Riker, Chairman (Locomobile Co. of America); Coker F. Clarkson, Sec. (A. L. A. M.); Henry Souther, Metallurgist, Hartford, Conn. Committee on Tests: H. E. Coffin, Chairman E. R. Thomas Motor Co.; A. L. Riker, Ex-officio (Locomobile Company of America); H. P. Maxim, Electric Vehicle Co.; Charles B. King, Northern Motor Car Co.; John Wilkinson, H. H. Franklin Mfg. Co.; Russell Huff, Packard Motor Car Co.; John G. Utz, Autocar Co.

Association of Motor Car Owners, Inc.—Times Bldg., New York City. Est. Feb., 1907. Org. to "protect owners against every form of overcharge and imposition, and to supply immediate relief for every possible contingency or mishap."

Association Patents Co.—7 E. 42d St., New York City. A patent holding company composed of members of and controlled by the A. L. A. M.

Aster Co.—1610 Broadway, New York City. Importers of Aster motors, carburetters, ignition apparatus and general supplies.

Aster Garage.—123 W. 52nd St., New York City. Garage.

Aster, Société l'.—St. Denis, France. Mfrs. auto. motors, motorcycle motors.

Aston Automobile Repair & Storage Co.—1185 State St., Bridgeport, Conn. Garage.

Aston Motor Accessories Co.—Birmingham, England. Mfrs. circulating pumps.

Aston, T. R.—Bridgeport, Conn. (Wayne.)

Astor Garage.—56 Sherman Ave., Newark, N. J. Garage.

Astor, John Jacob.—Born, Rhinebeck, N. Y., July 13, 1864. Ed. St. Paul's School, Concord, N. H., and Harvard University. Member Automobile Club of America and its Board of Governors

and Good Roads Committee: one of the earliest users of automobiles in America. Inventor of a pneumatic machine to remove worn-out materials from roads before new stone is laid down, which received first prize at World's Columbian Exposition, 1893; also of a practical turbine engine, and other mechanical devices. Colonel on Gov. Morton's staff; commissioned Inspector-General, with rank of Lieut.-Col., U. S. V., May 15, 1898. Served in Cuba during Spanish-American War. Residences. Ferncliff, Rhinebeck, N. Y., and 840 5th Ave., New York City. Secretary's office, 23 W. 26th St., New York City.



Atchison Perforating Co.—303 Dearborn St., Chicago, Ill. Mfrs. metals (perforated)

Ateliers Amstoutz et Ravel—Ave. de Fontaine-Argent, Besançon (Doubs), France. Mfrs. auto motors, motorcycle motors.

Ateliers de Construction.—50 ave. de Normandie, Colombes, France Mfrs. marine motors. (A. C. D.)

Ateliers de Constructions Mécaniques.—105 rue de Fazilleau, Levallois, France. Mfrs. auto motors. (Signia.)

Ateliers des Télégraphes, G. Hasler.—Berne, Switzerland. Mfrs. speed indicators.

Ateliers et Chanetris Cosmos.—Ostend, Belgium. Mfrs. marine motors.

Ateliers F. R. M.—Sclessin, Liège, Belgium. Mfrs. differential gears. lamps, electric lamps, oil lamps.

Ateliers H. Leclerc, Société Anonyme.—33 quai St. Leonard, Liège, Belgium. Mfrs. coils, high and low tension magnetos, spark plugs, acetylene, electric and oil lamps.

Atha Steel Co.—Newark, N. J. Mfrs. castings (steel).

Atha Tool Co., The.—Newark, N. J. Mfrs. tools.

Atherton, Thos. H.—Vice-Pres. Sheldon Axle Co., Wilkes-Barre, Pa.

Atkinson Auto Co.—Lockport, N. Y. (Maxwell)

Athwart.—From side to side; transversely.

Athwartship.—Crosswise of a vessel.

Atkins & Ellwood.—Elkhart, Ind. (American Simplex.)

Atkinson Auto & Garage Co.—Ashley Bldg., Lockport, N. Y. (Maxwell.)

Atkinson, J. E.—Springfield, Miss.

(Cadillac.)

Atlanta Auto Co.—Atlanta, Ga. Garage

Atlanta Phonograph Co.—Atlanta, Ga. (Walham.)

Atlantic Auto Co. & Machine Wks.—No. Carolina Ave., Atlantic City, N. J. (Premier, Delaunay-Belleville, Mitchell.)

Atlantic Co., The.—Amesbury, Mass. Mfrs. motorboats, motors (marine).

Atlantic City Automobile Club.—

Hotel Seaside, Atlantic City, N. J.

Walter C. Edge, Pres.; Louis Kuehnle,

Vice-Pres.; Robert M. Johnston, Sec.;

John Donnelly, Treas. Organized Aug.

25, 1905, "for pleasure and promoting

beach races." Chairmen of Committees:

Harry Cook, Racing; Warren Somers,

Road. Charter Members: Louis Kuehnle,

Harry J. Mulock, J. Everett Mehrer,

John Donnelly, Robert M. Johnston,

Charles A. Mack. Four racing events

of 3 days each, Sept., 1905, April, 1906,

Sept., 1906, and Aug., 1907, have been promoted.

Club holds right of way, secured from South Atlantic City, for a

beach course of 2½ miles for racing

purposes. Admitted to membership A.

A. A. Sept. 1, 1905. Present membership,

50. Member A. A. A.

Atlantic Insulated Wire & Cable Co.—

120 Liberty St., New York. Mfrs. wire

(insulated).

Atlantic Motor Car Co.—1776 Broad-

way, New York City. (Stoddard-Day-

ton) Est. 1906. Cap. \$25,000. Richard

T. Newton, Pres.; Allan H. Whiting,

Vice-Pres.; John Desmond, Sec. Re-

pairing.

Atlantic Motor Supply & Screw Co.

—48 Binford St., Boston, Mass. Mfrs.

spark plugs.

Atlas Automobile Co.—College and

Ellsworth Aves., Pittsburg, Pa. (Max-

well, Premier, Chadwick.)

Atlas Bolt & Screw Co., The.—Cleve-

land, O. Mfrs. bolts, nuts, screws.

Atlas Drop Forge Co.—Lansing, Mich.

Mfrs. automobile and marine forgings,

single and multiple throw cranks.

Atlas Foundry Co.—801 So. Washing-

ton St., Peoria, Ill. Mfrs. castings (gray

iron).

Atlas Mfg. Co.—Hampton, N. H.

Mfrs. hampers

Atlas Motor Car Co. (formerly Knox

Motor Truck Co.—Birnie Ave., Spring-

field, Mass. Makers of the Atlas trucks,

delivery vans and pleasure cars. First

pleasure car marketed in 1907. Three

models since. Harry A. Knox, Pres.;

Walter S. Pease, Vice-Pres. and Pur-

agt.; Walter G. Morse, Treas. and Advt.

Mgr.; F. T. Craig, Supt.; Philip A. Will-

iams, Jr., Sales Mgr. Agents and Deal-

ers: F. W. McRae, Atlanta, Ga.; C. A.

Reber, Allentown, Pa.; Harry Fosdick

Co., 55 Stanhope St., Boston, Mass.; J. B. Wilhilde, Baltimore, Md.; Herbert Havens, Denver, Colo.; W. N. Potter & Sons, Greenfield, Mass.; Motor Vehicle Co., Harrisburg, Pa.; Chas. H. Hudson, Hudson, N. Y.; Fred E. Gilbert, Jacksonville, Fla.; Renton & Williams Motor Car Co., Los Angeles, Cal.; Julian Dennison, New Haven, Conn.; Chas. S. Cooper, Newark, N. J.; Crane Auto & Garage Co., Providence, R. I.; C. H. Martin, 29 W. 42d St., New York City; Barnstable Motor Car Co., West Barnstable, Mass.; E. J. Wilkins, Gloversville, N. Y.; Burnap & Roser, Canajoharie, N. Y.; Frank E. Stiverson, Cleveland, O.; A. Fournier, New London, Conn.; Automobile Renting Co., St. Louis, Mo.; M. A. Shuey, So. Bend, Ind.; Simmons & Francis, Flandreau, S. D.; Chase Motor Truck Co., Syracuse, N. Y.; Northampton Garage, Northampton, Mass.; Van Fleet Mfg. Co., Joliet, Ill.

Atlas Motor Co.—102 W. 107th St., New York City. Garage.

Atlas, Société des Voitures Automobiles.—101 rue de la Convention, Paris, France. Mfrs. automobiles, gas.

Atmosphere.—The mass or body of gases, chiefly air (see Air), that surrounds the earth to a height that has been estimated at 50 miles. The hydrostatic pressure due to the weight of the air is approximately 15 pounds per square inch (1.033 kilogramme per cm²) at the surface of the earth, and can support a column of mercury about 30 inches in height.

For many purposes of reference, an arbitrary standard of atmospheric pressure equal to that of 76 cm of mercury is adopted. For some purposes a pressure of one million dynes per square centimetre is assumed, which is somewhat less than the "normal pressure," being nearly equal to 75 cm. of mercury.

Atom.—In the chemical sense, the smallest quantity of a single body capable of entering into molecular combination with one or more other bodies. For example, one atom of hydrogen (H) enters into combination with one atom of chlorine (Cl) to form hydrochloric acid gas (HCl).

Atomize.—To convert into a mist by spraying.

Atomizing Nozzle.—See Nozzle. Spray.
Atterburg, G. W.—Pres. Autocar Equipment Co., 77-79 Edward St., Buffalo, N. Y.

Attleboro Automobile Co.—74 Union St., Attleboro, Mass (Pope-Waverley, Stanley, Autocar, Stevens-Duryea, Pierce-Arrow. Est. 1903. W. A. Engley, Treas. Garage, 24 cars; repairing, electric charging and supplies.

Atwater-Kent Mfg. Works.—42-46 W.

6th St., Philadelphia, Pa. Mfrs. Ammeters and voltmeters.

Atwater Mfg. Co., The.—Southington, Conn. Mfrs. drop forgings.

Atwood, A.—Plymouth, Mass. (Waltham.)

Atwood Automobile Co.—2815 Monroe St., Toledo, Ohio. (Franklin, Elmore, Pope-Hartford, Pope-Waverley.)

Atwood, Frank.—Vice-Pres. Motor Equipment Co., 901 Pike St., Seattle, Wash.

Atwood F., & Co.—141 Saffron Hill, London, E. C., England. Mfrs. metallic rims.

Atwood Mfg. Co.—Amesbury, Mass. Mfrs. generators (acetylene), lamps, name plates, trimmings (metal), water column mirrors, garage.

Auburn Agency.—Santa Ana, Cal. Garage.

Auburn Auto Co.—So. Main St., Auburn, Ind. Makers of Auburn car. First automobile marketed 1903; 6 different models since. Cap. (surplus and undivided profits), \$82,000. Chas. Eckhart, Pres.; Morris Eckhart, Sec., Treas. and Gen. Mgr.; F. E. Eckhart, Vice-Pres.; Henry Moore, Designer; Frank Shugars, Supt.; Frank Turrell, Asst. Supt. Agents: City Hall Auto Co., San Francisco, Cal.; Hills & Beason Auto Co., Indianapolis, Ind.; H. E. Gilley Co., Los Angeles, Cal.; Bergers Auto Co., Omaha, Neb.; Auburn Auto Co., H. A. Rhine, Mgr., Washington, D. C.

Auburn Auto Co.—1312 Staunton St., Washington, D. C. (Auburn.)

Auburn Automobile Co.—Water St., Auburn, N. Y. (Franklin, Pope-Hartford, Royal, Northern, Peerless.) Garage; repairing; supplies.

Auburn Ave. Auto Station.—419 Auburn Ave., Buffalo, N. Y. Garage.

Auburn Ball Bearing Co.—Rochester, N. Y. Mfrs. bearings (ball), hubs.

Auction Co.—9th St., Pittsburg, Pa. Garage.

Auger, Frank N.—Bloomington St., Streator, Ill. (Ford.)

Augsburger Verein fur Luftschiffahrt (Augsburg Aero Club).—Augsburg, Germany.

Augusta Automobile Club.—137 8th St., Augusta, Ga. Pres., Dr. W. C. Lyle; 1st Vice-Pres., Geo. R. Lombard; 2nd Vice-Pres., D. F. Jack; Sec. and Treas., W. Martin. Organized Feb. 22, 1904, to "promote and protect the autoists' interests and to secure good roads." Charter members, 52. Present membership, 51.

Augusta Garage Co.—519 Broad St., Atlanta, Ga. Garage.

Auld, W. C.—Green Valley, Ill. (Holsman.)

Aurora Auto Club.—W. I. Ferris, Pres., Aurora, Ill.

Aurora Automatic Machinery Co.—421 Claim St., Aurora, Ill. Mfrs. carbureters, oil cups, motors, motorcycles.

Aurora Automobile Co.—Aurora, Neb. (Mitchell.)

Aurora Motor Works.—North Aurora, Ill. Mfrs. castings (brass, bronze, aluminum and copper), motors (gasoline, marine), automobiles, gas.

Auscher, Leon.—Born at Strasbourg, May 31, 1866. No. 34 Boulevard Victor-Hugo. Chevalier of the Legion of Honor; Engineer of Arts and Manufactures; co-partner in the house of J.



Rothschild and Sons (Rheims and Auscher.) Took part in the first automobile races (Marseilles-Nice-Paris-Amsterdam) under the name of "Roscoff;" is secretary of the Technical Committee of the T. C. F.; vice-president of the Touring Com-

mittee of the A. C. F.; secretary of the Committee on Races of the A. C. F.; member of the committee of the A. G. A., and of the Syndical Chamber of the Automobile. He is author of a work entitled *Le Tourisme en Automobile*.

Austin Agency, Inc.—Lowell, Mass. Cap. \$10,000. Incorporators: Frederick E. Litchfield, Charles H. Rippey, Jr., and Everett S. Litchfield. (Austin.)

Austin Agency, Inc.—Motor Mart, Park Sq., Boston, Mass. (Austin.)

Austin Automobile Club.—Austin, Ill. Pres., J. H. Francis; 1st Vice-Pres., C. E. Ingalls; 2nd Vice-Pres., J. E. Plew; Sec., E. C. Westwood; Treas., Jus. Wagman; Counsel, A. J. Redmond; Surgeon, Dr. B. A. McBurney. Directors: Dr. F. H. Newell and C. H. Burras. Former president: J. H. Francis. Organized 1905, "for the advancement of general motoring interests." Member A. A. A.

Austin Automobile Co.—484 Broad St., Newark, N. J. (Ford.)

Austin Auto Co.—Grand Rapids, Mich. Mfrs. automobiles, gas.

Austin, H. K.—Reading, Mass. Garage.

Austin & Co., Robert.—227 Pacific St., Brooklyn, N. Y. Vulcanizing and tire repairing.

Austin Motor Co., Ltd.—Northfield, Birmingham, England. Mfrs. automobiles, gas. (Austin)

Austin, R. S.—El Paso, Tex. (Thomas Flyer.)

Austin, W. W.—Supt. The Garford Co., Elyria, O.

Austria Motorenwerke, Ignaz & Josef Mezera.—Vienna, Austria. Mfrs. motorcycles.

Austral, Société Anonyme de Constructions Mécaniques d'.—8 rue du Débarcadère, Paris, France. Mfrs. automobiles, gas. (Austral); tricars (Austral).

Autmo Cabinet Co., The.—Cox Bldg., Rochester, N. Y. Mfrs. tools, vises, cabinets.

Auto.—A very common abbreviation of the word "automobile," and very often used in that sense in combination also, as "auto-clock," "auto-coil," "auto-meter," "auto-trembler," etc.

Auto Agency & Supply Co.—San Antonio, Tex. (Waltham.)

Auto Appliance Co.—24 Mechanic St., Newark, N. J. Mfrs. spark plugs, spark timing devices, switches (electric and electric lock).

Auto Arcade Co.—164 W. 46th St., New York City. (Second-hand cars.)

Auto Boat.—The same as motor-boat.

Auto Boat Co.—West Mystic, Conn. Mfrs. motor boats.

Auto Body & Finishing Co.—Amesbury, Mass. Mfrs. bodies (wood and metallic).

Auto Body Co., The.—Franklin Ave., Lansing, Mich. Mfrs. bodies (wood and metallic), boxes (spark coil), dashes and fenders.

Auto Buggy Mfg. Co.—4395 Olive St., St. Louis, Mo. Mfrs. automobiles, gas.

Auto Bulletin, The.—821 Prudential Bldg., Newark, N. J. Pub. monthly. Frederick R. Pratt, Editor; J. H. Conannon, Publisher.

Auto-Car.—A synonym for "automobile," or "motor-car."

Autocar, The.—Pub. at 20 Tudor St., London E. C., England.

Auto-Car Equipment Co.—77-79 Edward St., Buffalo, N. Y. Mfrs. automobiles, gasoline and electric commercial. First automobile marketed Jan. 1, 1903; 4 models since. Cap. \$50,000. G. W. Atterbury, Pres.; E. B. Olmsted, Sec., Sales Mgr. and Adv. Mgr.; R. G. Wright, Supt. Supplies; garage.

Auto-Car Equipment Co., The.—77 Edward St., Buffalo, N. Y. Supplies; garage.

Auto Car Garage.—38 Riley St., Buffalo, N. Y. Garage.

Auto Chemical & Mfg. Co.—1770 Broadway, New York City. Mfrs. anti-freezing solutions.

Auto Club Garage.—451 Vermont Ave., Buffalo, N. Y. Garage.

Auto Co. of Cal.—387 Golden Gate Ave., San Francisco, Cal. (Knox Motor Trucks.)

Auto Corp. & Agency.—138 W. 38th St., New York City. Garage.

Auto Crank Shaft Co.—793-7 Gratiot Ave., Detroit, Mich. Mfrs. crank shafts.

Auto Cycle Equipment Co.—Michigan City, Ind. (Jackson.)

Auto, De.—Published at 5-8 Klein Heiligland, Haarlem, Holland.

Auto-Demarreur Lemale.—31 quai de Suresnes, Suresnes, France. Mfrs. starter, automatic.

Auto Electric Co.—41 County St., Attleboro, Mass. (Ford.)

Auto Equipment Co.—472 Euclid Ave., Cleveland, Ohio. Garage.

Auto Equipment Co.—260 Jefferson Ave., Detroit, Mich. Garage.

Auto Equipment Co., The.—1424-26 Michigan Ave., Chicago, Ill. Mfrs. bodies (wood and metallic), tops (auto), wind shields (glass).

Auto Exchange.—501 Broadway, Milwaukee, Wis. (Jackson, Dragon.)

Auto Exchange.—7 Reservoir Ave., Providence, R. I. Garage.

Auto Express Delivery Co.—Erie Court, Cleveland, Ohio. Garage.

Auto Garage.—Calle del Bosque, Mexico City, Mex. Garage.

Auto Garage.—Pomona, Cal. (Rambler.)

Auto Garage & Repair Co.—31 E. 4th St., Dayton, Ohio. Garage.

Auto Garage & Repair Co.—198 Ellison St., Paterson, N. J. (Manhattan.)

Auto Garage Co., The, Inc.—146-8 W. 39th St., New York City. Est. Aug. 1906. J. E. Davey, pres.; Oscar Coolican, Sec. and Treas.; Willard Crossman, Vice-Pres. Garage, 60 cars; repairing.

Auto Garage Co.—Meyersdale, Pa. (Maxwell.)

Auto Garage Co.—701 Quincy St., Brooklyn, N. Y. Garage.

Auto Garment Co.—208 B Ave., Cedar Rapids, Ia. Mfrs. wearing apparel (miscellaneous).

Auto Goods Co.—60 State St., Boston, Mass. Mfrs. tire repair kits.

Auto Hospital.—425 Lake Ave., Rochester, N. Y. Garage.

Auto Import Co.—1786 Broadway, New York City. Importers Rochet-Schneider. Est. 1903. Benj. Eichberg, Pres.; J. S. Josephs, Treas. and Gen. Mgr.; John G. Dale, Sec. Repairing.

Auto Import Co.—90 Stanley St., Montreal, Canada. (Humber.)

Auto Improvement Co.—Factory, 316 Hudson St.; sales and show rooms, 2128 Broadway, New York City. Mfrs. speedometers, tire tools, automatic starters, vulcanizers, carburetters.

Auto Inn.—345 W. 2nd St., Elyria, Ohio. Garage.

Auto Inn.—226 Main St., Oshkosh, Wis. Garage.

Auto Instrument Co.—228 No. 4th St., Philadelphia, Pa. Mfrs. spark timing devices.

Auto, L'.—10 Rue de Faubourg Montmartre, Paris, France. Daily automobile paper.

Auto, L'.—Published at 71 Foro Bonaparte, Milan, Italy.

Auto Livery.—1604 Broadway and 142 W. 18th St., New York City. Garage.

Auto Livery Co.—234 14th St., Washington, D. C. Garage.

Auto Livery Co.—1375 Ontario St., Cleveland, O. Garage.

Auto Livery Co.—Golden Gate and Van Ness Aves., San Francisco, Cal. (Peerless, Matheson.)

Auto Livery & Express Co.—S. 10th and Tacoma Ave., Tacoma, Wash. (Maxwell, Johnson.)

Auto Livery & Repair Co.—707 Broadarm St., Denver, Colo. Repairing.

Auto Livery & Repair Co.—1426 Glenway, Cincinnati, O. Garage.

Auto Lock Co.—6546 Minerva Ave., Chicago, Ill. Mfrs. switches (electric, lock).

Auto Lock Plug Co., Inc.—31 Nassau St., New York City. Mfrs. switches (electric, lock).

Auto Mach. & Repair Co.—176 East Main St., Wilkes-Barre, Pa. (Winton.)

Auto Machinery Co., Ltd.—Coventry, England. Mfrs. ball-bearings.

Auto Machine Wks. & Garage.—413 So. 5th St., Leavenworth, Kan. (Ford.)

Auto Machine Works.—101 E. 6th St., Corona, Riverside County, Cal. Est. 1889. Garage, 20 cars; repairing. (Rambler.)

Auto Maintenance Co.—1239 Fulton St., Brooklyn, N. Y. (Dolson.)

Auto Maintenance Co.—1141 So. Broad St., Philadelphia, Pa. (Riviera.)

Auto Maintenance Co.—205 No. Jackson Blvd., Chicago, Ill. Repairing.

Auto Mart.—37th St. and 7th Ave., New York City. Garage.

Automatic Headlight Attachment Mfg. Co.—33d and K Sts., N. W., Washington, D. C. Mfrs. automatic headlight attachments.

Auto-Mixte, Société l'.—93 rue Hayeux, Herstal-lez-Liège, Belgium. Mfrs. automobiles, gas-electric (Auto-mixte.)

Auto-Motor.—A self-propelled machine, such as an automobile.

Auto & Motor Boat Co.—1205 Capitol Ave., Houston, Tex. (Cameron.)

Auto & Motor Co., The.—Baltimore, Md. Automobile instruction.

Auto Motor Car Co.—804-806-808 Sycamore St., Cincinnati, O. (Berliet, Rainier, Welch, Stoddard-Dayton,

Baker Electric, Rapid, Couple-gear trucks.) Est. 1905. Cap. \$50,000. R. S. Payne, Pres. and Treas.; J. A. Payne, Vice-Pres.; J. H. Ratliff, Sec. and Gen. Mgr.; C. S. Bugbee, Sales Mgr.; L. E. Bailey, Supt. Garage, 155 cars; repairing.

Auto Motor Co.—Baltimore, Md. (Maxwell, Mitchell, Rambler, Queen.)

Automotor Journal.—Pub. at 44 St. Martin's Lane, W. C., London, England.

Auto National Renting Co.—109 W. 37th St., New York City. Renting.

Auto Novelty Co.—Milwaukee, Wis. Mfrs. compression meters (cylinder), gauge pressure indicators, spark plugs.

Auto Oil Co.—Jackson, Mich. Mfrs. oils (semi-solid), polishes (auto body), soaps (auto body), soaps (hand).

Auto Outing & Transit Co.—Baltimore, Md. (Buick.)

Auto & Power Appliance Co.—The Arcade, Cleveland, O. Mfrs. mufflers, pumps (circulating), spark timing devices.

Auto Pump Co.—Springville, N. Y. Mfrs. tire pumps.

Auto Rail & Equipment Co.—113 Michigan Trust Bldg., Grand Rapids, Mich. Mfrs. folding robe rails and adjustable foot rails. Cap. \$35,000. Inc. March 1, 1907. John T. Byrne, Pres.; H. Thomasma, Vice-Pres.; Roger W. Griswold, Sec. and Treas.; C. C. Kusterer, Mgr.

Auto Rapid Transit Co.—Trane Bldg., La Crosse, Wis. Garage.

Auto Rebuilding Co.—802 Beecher St., Indianapolis, Ind. Repairing.

Auto Renting & Selling Co.—111 W. 37th St., New York City. Garage.

Auto Renting and Touring Co.—304 W. 54th St., New York City. Garage.

Auto Renting Co.—1626 Broadway, New York City. Garage.

Auto Repair Co.—559 7th Ave., Pittsburgh, Pa. (Corbin, Haynes.)

Auto Review, The.—Pub. at St. Louis, Mo.

Auto Selling & Repair Co.—304 Northwestern Bldg., Minneapolis, Minn. (Dragon.)

Auto Selling & Supply Co.—15 4th St., New Bedford, Mass. (Maxwell.)

Auto Shine Co.—Buffalo, N. Y. Mfrs. polishes (metal).

Auto Shop.—Park St., Ashtabula, O. Garage.

Auto Shop.—448 Broadway, Paterson, N. J. (Columbia, Stevens-Duryea, White.)

Auto Shop Co., The.—731 Vincent Ave., N. E., Cleveland, O. (Franklin, Thomas Flyer, Thomas Detroit.) Est. Feb. 1, 1906. Cap. \$50,000. Edwin V. Voris, Pres.; Rollin W. Lusk, Vice-

Pres.; Ira B. Sperry, Sec.; James H. Burris, Treas.; Benj. R. Stevens, Gen. Mgr.; Edward M. Springsteen, Sales Mgr. Garage, 50 cars; repairing.

Auto Sight-Seeing Co.—77 Edward St., Buffalo, N. Y. Garage; rental service.

Auto Specialty Co.—6 E. Madison St., Chicago, Ill. Mfrs. and mfrs. agents; valve lifters, timers, ammeters, voltmeters, voltammeters, storage batteries, primary batteries, spark coils, chain grips. Est. July, 1906. A. J. Jackson, proprietor and mgr.

Auto Spring Repairer Co.—54 Maiden Lane, New York City. Mfrs., spring repairers.

Auto Supply Co., The.—1733-1737 Broadway, New York City. Est. 1899. Supplies, apparel and tools. John Lurie, Proprietor.

Auto Supply & Storage Co.—1416 Madison Ave., Baltimore, Md. (National, Lambert, Holsman, Logan, Jewell, Studebaker electric). Mfrs. Norwood vehicle castor and portable turntable. Est. April, 1905. Cap. \$40,000. J. E. Norwood, Pres. and Treas.; J. E. Tiffitt, Vice-Pres.; R. H. Carr, Sec. Garage, 100 cars; repairing.

Auto Tally-Ho Co.—1358 Broadway, New York City. Garage.

Auto Tire Co.—Kansas City, Mo. (Morgan & Wright tires.)

Auto Tire & Repair Station.—5918 Baum St., Pittsburg, Pa. Vulcanizing.

Auto Tire Vulcanizing Co.—Factory, 689 Lawrence St.; Office, Plain St., Lowell, Mass. Mfrs. vulcanizers, moulds, retreading kettles, coils "Flat wire," cores. Est. 1905. C. A. Smith, proprietor.

Auto Top Co.—209 E. Columbia St., Fort Wayne, Ind. Mfrs. aprons and curtains (storm), body irons, cushions, tops (auto).

Auto Touring Co.—133 W. 38th St., New York City. Garage.

Auto Traffic Co.—401 Liberty Bldg., Pittsburg, Pa. Garage.

Auto Transit & Repair Co.—East 5th St., Canton, Ohio. (Jackson.)

Auto Transit & Repair Co.—Milwaukee, Wis. (Jackson.)

Auto Transportation Co.—309 W. 41st St., New York City. Garage.

Auto-Truck.—A self-propelled, strong vehicle designed for the "trucking" of heavy merchandise.

Auto-Vapeur, Société L'—116 Blvd. Pereire, Paris, France. Mfrs. automobiles, steam.

Auto Vehicle Co.—540 Golden Gate Ave., San Francisco, Cal. Mfrs. automobiles, gas. (Tourist.)

Auto Vehicle Co.—10th and Main Sts., Los Angeles, Cal. (Atlas Trucks.)

Auto Vehicle & Supply Co.—1841 Market St., San Francisco, Cal. (Rapid.)

Auto-Vélo.—5 rue Poisson, Paris, France. Mfrs. horns and exhaust horns.

Autobed Co., The.—Boston, Mass. Mfrs. jacks.

Autocar, The.—Pub. at 20 Tudor St., London, E. C., England. Weekly. Also pub. touring maps.

Autocar Co., The.—Ardmore, Pa. Makers of the Autocar, first marketed in 1897. Nine models made since. Cap., \$1,000,000. J. S. Clark, Pres.; E. A. Fitts, Sec. and Treas.; L. S. Clarke, Vice-Pres. and Consulting Engineer.; H. M. Coale, Sales Mgr.; J. H. Goulding, Pur. Agt.; W. W. Norton, Supt. Branch, Autocar Sales Co., 80th St. and Broadway, New York City. Agents and Dealers: Baltimore, Md., Mount Vernon Motor Co., No. 1118 Cathedral St.; Brooklyn, N. Y., Williamsburg Auto & Storage Co. (M. J. Wolfe, Prop.), 159 Clymer St.; Boston, Mass., Fred S. Smith, 38 Columbus Ave.; Buffalo, N. Y., E. T. Parkes, Fidelity Bldg.; Charlotte, N. C., The O. L. Barringer Co.; Chicago, Ill., The James Levy Co., 390 Wabash Ave.; Esbon, Kan., H. B. Keim; Hartford, Conn., Palace Auto Station Co., 348 Trumbull St.; Indianapolis, Ind., Indiana Automobile Co., 220 E. New York St.; Marion, O., C. C. Stoltz; Minneapolis, Minn., Barclay Automobile Co.; Middleboro, Mass., C. W. Maxim (Middleboro Auto Exchange); Newark, N. J., Motor Car Co. of New Jersey, 291 Halsey St.; New York, N. Y., Autocar Sales Co., Broadway and 80th St.; New Haven, Conn., W. A. Maynard; Philadelphia, Pa., General Motor Car Co., 249 N. Broad St.; Providence, R. I., Thomas & Lowe Machinery Co., Sabin and W. Exchange Sts.; San Francisco, Cal., Middleton Motor Car Co., 550 Golden Gate Ave.; St. Louis, Mo., Park Automobile Co., 4432 Olive St.; Salt Lake City, Utah, August Stocker, 71 S. State St.; Seattle, Wash., Broadway Automobile Co., Inc., Broadway and Madison St.; Staunton, Va., Frank Walter, Montgomery Hall; Washington, D. C., Pope Automobile Co.; Newburg, N. Y., Youngs & Co., 249 Grand St.; Los Angeles, Cal., Holst Bros., 139 E. 9th St.; Columbus, O., Curtin-Williams Auto Co., 122 Parsons Ave.; Savannah, Ga., R. V. Connerat, 18 E. State St.; Scranton, Pa., Standard Motor Car Co.; Richmond, Va., Motor Transfer Co.; Nashville, Tenn., B. R. Demonbreun, 113 Public Sq.

Autocar Sales Co.—Broadway and 80th St., New York, N. Y. (Autocar.)

Autocoil Co., The.—136 7th St., Jersey

City, N. J. Mfrs. all kinds of ignition apparatus. Member M. A. M. A. Authorized cap. \$100,000 (\$1,000 paid in). Est. 1904. Jno. J. Baumann, Pres.; Jno. J. Reagan, Sec.; Chas. D. Boyd, Treas.

Autodrome.—An enclosed field or park provided with a track especially arranged for the racing of automobiles.

Autoguides Dac.—8 place de la Concorde, Paris, France. Maps.

Autoist.—A synonym for "automobilist."

Autolight & Motor Supply Co., The, Inc.—506-508 No. Broad St., Philadelphia, Pa. Est. Dec. 1906. Formerly run under name of Paul P. Rippien. Complete line of automobile accessories and tools (jobbers). George Lee Thompson, Pres.; Jos. A. Janney, Jr., Treas.; Jos. A. Steinmetz, Sec.; Paul P. Rippien, Gen. Mgr.

Autolyte Mfg. Co.—10-12 Thomas St., New York City. Mfrs. horns, lamps.

Automatic.—A term (from the Greek words auto, stem of autos, "self," and maomai, "I move"), applied to every apparatus, or part of a mechanical apparatus, that possesses a motion independent of the human will, or of a special mechanical control. Thus, an inlet-valve is called "automatic," when it opens of itself at the moment of suction, such opening being the consequence of the depression in the cylinder produced by the down-stroke of the piston.

Automatic Carburetter.—See Carburetter.

Automatic Ducasble.—5 ave du Roule, Neuilly (Seine), France. Mfrs. tires (pneumatic), rubber.

Automatic Inlet Valve.—See Valve, Inlet.

Automatic Machine Co., The.—Bridgeport, Conn. Mfrs. motors (gasoline marine.)

Automatisme, L'.—8 blvd. d'Asnières, Neuilly-sur-Seine, France. Mfrs. carburetters.

Automobile.—A hybrid adjective-substantive (from Greek auto, stem of autos, "self," and Latin mobilis, "movable"), adopted as a generic term for self-propelled vehicles adapted to run and be steered on common roads and to carry either articles or passengers other than exclusively for their own use or guidance. The word is quite commonly abbreviated to "auto" simply; while a devotee of the new mode of locomotion is very frequently styled an "autoist." It is sometimes employed also in its original adjective sense of "self-movable" to form self-explaining compounds, such as "automobile boat," and the like.

Automobil' Das.—Published at 7 Ohmachstrasse, Strasbourg (Alsace), Ger-

many. Official organ of the A. C. d'Alsace.

Automobile, L'.—Published at 12 via Aurelio Saffi, Milan, Italy.

Automobile, L'.—Published at 7 rue Saint-Benoit, Paris, France.

Automobile, The.—Flatiron Bldg., New York City. Published weekly by the Class Journal Company. H. M. Swetland, Pres.; A. G. Batchelder, managing editor; R. F. Kelsey, C. B. Hayward and W. F. Bradley, Editorial Dept.; Business Dept., A. B. Swetland, Bus. Mgr.; L. R. Smith, Frank B. Barnett, W. I. Ralph, C. H. Gurnett and H. E. Westerdale, adv. solicitors. The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), Oct., 1903, and the Automobile Magazine (monthly), July, 1907.

Automobile Arcade.—Broadway and 49th St., New York City. Garage.

Automobile Association of Center County.—Robt. F. Hunter, Sec., Bellefonte, Pa. Member A. A. A.

Automobile Association, General.—Society for the encouragement of the automobile industry in France, founded under the patronage of the Automobile Club of France. Provisional quarters at 8 Place de la Concorde, Paris. President, M. de Dion; secretary general, E. Chaix. The object of the society is to second the Automobile Club of France and the Society of Encouragement in promoting the progress and extension of the industries connected with automobilism, in popularizing matters pertaining to mechanical locomotion, in studying and pursuing the realization of all useful measures of technical, administrative, legislative and economic order, and in grouping, for the defense of their common interests, all those who manufacture, sell or own motor vehicles, as well as all those who are interested in mechanical traction.

Automobile Auction Co. of America.—41-43 West 63rd St., New York City. Garage; auction sales of second-hand cars.

Automobile Belge, L'.—Published at 50 rue Grétry, Brussels, Belgium.

Automobile Blue Book.—Class Journal Pub. Co., publishers, Flatiron Bldg., New York City.

Automobile Buggy Top Co. of America.—Noxen, Pa. Mfrs. tops (auto).

Automobile & Carriage Builders' Journal.—Published at 16 Eldon St., London, England.

Automobile Club of Alsace-Lorraine.—Ohmachstrasse, Strasbourg (Alsace-Lorraine).

Automobile Club of America (A. C. A.).—54th St., West of Broadway, New

York City. Member A. A. A. Pres., Colgate Hoyt; 1st Vice-Pres., Schuyler Skaats Wheeler; 2nd Vice-Pres., John E. Borne; 3rd Vice-Pres., Gen. George Moore Smith; Treas., W. W. Fanshawe; Consulting Engineer, Schuyler Skaats Wheeler, Sc. D.; Chaplain, Rev. Wilton Merle Smith, D. D.; Sec., S. M. Butler.

Organized June 7, 1899, as the result of a call sent out by Whitney Lyon and George F. Chamberlain, which call contained the following statement: "In view of the rapidly increasing number who own and operate self-propelled pleasure vehicles in this country and the general widespread interest in the subject, both here and abroad, and the almost certain use of the automobile as a form of sport in the United States and the difficulty of procuring proper storage and care for the vehicles, it has been thought desirable to call this meeting of owners or intending owners of these vehicles for a conference looking toward the formation of a club which in due time shall have a clubhouse where the carriage may be properly stored and cared for by competent mechanics, and where may be found also literature on the development of the automobile as well as suitable meeting rooms for social intercourse and general interchange of views on the subject.

At this meeting, held at the Waldorf-Astoria, George F. Chamberlain was elected chairman and Homer W. Hedge, secretary. About thirty persons were present and a committee was selected to draft a constitution and by-laws and to perfect the organization. On August 16 a charter was granted under New York laws and the organization incorporated. On October 16 the constitution and by-laws were adopted and these officers were chosen: Acting Pres., Geo. F. Chamberlain; Treas., V. Everit Macy; Sec., Homer W. Hedge.

The club had its first parade and club run on Nov. 4, 1899, when 34 motor vehicles, headed by a band of music, started up Fifth avenue for the Claremont on Riverside Drive, which most of the vehicles reached safely. The club promoted its first road race on April 14, 1900, over a 50-mile course on Long Island. The race was won by A. L. Riker in a specially constructed electric vehicle, which covered the distance in 2 hrs., 3 min. and 30 seconds. There were ten entries. The first long run was in Philadelphia on June 2, 1900, in which 20 vehicles started and 16 finished. They left the Waldorf-Astoria at 7:30 a. m., and the first car reached Philadelphia at 7:20 p. m., the distance, by way of Trenton and Moorestown, being 117 miles. The first annual exhibition

was held in Madison Square Garden beginning Nov. 3, 1900, with 66 exhibits.

The first long run, styled an "endurance contest," began Sept. 9, 1901, from New York, Buffalo being the point of destination. Eighty cars started and 42 had reached Rochester September 13, when the run was declared off upon the receipt of the news that President McKinley, who had been shot just before the start of the run, had succumbed to his injuries. The first 100-mile non-stop endurance contest was held May 30, 1902, over a course from New York to Southport, just outside of Bridgeport, Conn., and return. There were 55 contesting cars, 44 of which finished, 20 of them making a non-stop run. On May 20 and 21, 1903, the first commercial vehicle contest was held over a course mapped out in New York City and suburbs. On the first day 11 vehicles started and 9 finished; on the second 9 started and 7 finished.

In May, 1905, the long-talked-of project to build a clubhouse took definite shape. A building committee was appointed consisting of Colgate Hoyt, Chairman; Dr. Schuyler Skaats Wheeler and Albert R. Shattuck. The land on which this clubhouse stands was purchased in May, 1905, for \$210,000, and the building itself is estimated to have cost about \$350,000. This clubhouse was the first building to be constructed in the city of New York of re-enforced concrete. It is believed to be absolutely fireproof. Ernest Flagg of New York City is the architect. The cornerstone was laid with appropriate ceremonies on May 21, 1906, and the house was opened in the summer of 1907, while the series of meetings began Friday, October 18, when cups won in the club's sealed mechanism contest were presented.

The governors and committees follow: Board of Governors: Colgate Hoyt, Pres.; Schuyler Skaats Wheeler, 1st Vice-Pres.; John E. Borne, 2nd Vice-Pres.; Gen. George Moore Smith, 3rd Vice-Pres. Executive Committee: Schuyler Skaats Wheeler, Chairman; A. R. Shattuck, Henry Sanderson; Christopher M. Lowther, Clerk of Committee. House Committee: Schuyler Skaats Wheeler, Chairman; A. R. Shattuck, Henry Sanderson, Dave H. Morris, George F. Chamberlain. Good Roads Committee: A. R. Shattuck, Chairman; Col. John Jacob Astor, John F. Plummer, Jr. Exhibition Committee: General George Moore Smith, Chairman; Alan R. Hawley, William Pierson Hamilton. Runs and Tours Committee: Waldron Williams, Chairman; Carl H. Page, Cortlandt Field Bishop, Augustus Post, A. R.

Shattuck, J. M. Porter, Winslow Tracy Williams. Library Committee: A. R. Shattuck, Chairman; Phillip T. Dodge, Rev. Wilton Merle Smith. Membership Committee: Melville D. Chapman, Chairman; Charles B. Dillingham, Gage E. Tarbell. Law and Ordinance Committee: W. W. Niles, Chairman; Winthrop E. Scarritt, William H. Page. Racing Committee: Robert Lee Morrell, Chairman; John A. Hill, E. T. Birdsall, A. H. Whiting. Map Committee: Cortlandt Field Bishop, Chairman; Henry R. Taylor. Building Committee: Schuyler Skaats Wheeler, Chairman; A. R. Shattuck, General George Moore Smith, Dave H. Morris. Sign Post Committee: Jefferson Seligman, Chairman; Melville D. Chapman, Irving Brokaw. Committee on City Streets: W. W. Niles, Chairman; Wm. R. Warren, C. E. Knoblauch, Orrel A. Parker, Charles S. Towle. Committee on Foreign Relations: J. Howard Johnston, Chairman; William K. Vanderbilt, Jr., J. Dunbar Wright, James L. Breese, William S. Hogan. Committee on Public Safety: Winthrop E. Scarritt, Chairman; George F. Chamberlain, A. R. Shattuck, Dave H. Morris.

Automobile Club of Auburn.—148 Genesee St., Auburn, N. Y. Pres., W. F. Wait; 1st Vice-Pres., S. C. Tallman; 2nd Vice-Pres., W. B. Barnes; Sec. and Treas., Dr. G. W. Whitney. Organized May 27, 1903. Chairmen of Committees: Irving W. Smith, Membership; Hon. W. E. Woodwin, Laws and Ordinances; Dr. R. B. Avery, Roads. Charter Members: W. F. Wait, S. C. Tallman, W. B. Barnes, Dr. G. W. Whitney, George Barrett, S. C. Sharp, Dr. R. B. Avery, Dr. W. H. Coe, Lester S. Wait, H. L. Stevens, Emory Caldwell, Dr. L. P. Meaker, C. T. Schilling, Bradford Tallman. Present membership, 52. Member A. A. A.

Automobile Club of Austria ("Oesterreicher Automobil Club").—10 Koernthnerring, Vienna, Austria.

Automobile Club of Baltimore City.—Baltimore, Md. Jas. S. Reese, Sec. Member A. A. A.

Automobile Club of Barcelona.—Rue de Rosselon, Barcelona, Spain.

Automobile Club of Belgium.—5 Place Royale Brussels, Belgium. President, H. de Grunne; secretary general de Villegas de Saint-Pierre.

Automobile Club of Blair Co.—Altoona, Pa. R. H. Fay, Sec. Member A. A. A.

Automobile Club of Bridgeport.—Bridgeport, Conn. F. T. Staples, Sec. Member A. A. A.

Automobile Club of Buffalo.—760 Main St., Buffalo, N. Y. Pres., Seymour P. White; Vice-Pres., F. B. Hower;

Sec., Dai H. Lewis; Treas., John M. Satterfield. Organized June, 1903, to "conduct a social and protective organization of all persons who own or are interested in motor pleasure vehicles; to co-operate in securing rational legislation and ordinances concerning the use of such vehicles; to protect the interests of owners and users of motor pleasure vehicles against unjust or unreasonable legislation; to assist in securing the proper punishment of those who flagrantly violate the laws and ordinances regulating the use of the highways, streets, and parks; and to promote and encourage the construction and maintenance of good roads. Chairmen of Committees: D. H. Lewis, Membership; H. A. Meldrum, Law and Ordinances; F. B. Hower, Grievances; J. B. Eccleston, Entertainment; Seymour P. White, Executive; John M. Satterfield, Roads; A. H. Knoll, Law and Order. Former presidents: W. H. Hotchkiss, A. H. Knoll, H. A. Meldrum. Member A. A. A.

Automobile Club of California.—F. W. McNear, Sec., 415 Montgomery St., San Francisco, Cal.

Automobile Club of Central Pennsylvania.—F. R. Slifer, Sec., Milton, Pa.

Automobile Club of Cincinnati.—3410 Clifton Ave., Cincinnati, O. Pres., Val Duttonhofer; 1st Vice-Pres., Dr. A. B. Heyl; 2nd Vice-Pres., F. N. Temple; Sec., Dr. L. S. Colter; Treas., C. Gordon Neff; Consulting Engineer, E. J. Carpenter. Organized March 19, 1901, "to protect and further the interests of automobile users." Charter Members: Max C. Fleischmann, R. A. Holder, F. H. Miller, Dr. G. M. Allen, Dr. L. S. Colter, Edw. Muhlhauser, Rufus King, Jr., Stanley Ramsey, Howard Rogers, T. C. Meadows, R. H. Fox. Chairmen of Committees: W. W. Smith, Law and Legislation; Dr. L. S. Colter, Membership; R. E. Gerkins, Runs and Tours; Dr. A. B. Heyl, Good Roads; H. D. Crane, Road Signs. Former presidents: R. A. Holden, F. C. Miller. Present membership, 230. Member A. A. A.

Automobile Club of Circleville.—Circleville, O.

Automobile Club of Columbia County.—Dr. C. W. Snyder, Sec., Hudson, N. Y. Member A. A. A.

Automobile Club of Davenport.—Davenport, Ia. Pres., J. H. Hass; Vice-Pres., J. E. Burmeister; Sec., A. H. Ruebsam; Treas., A. E. Rosenthal. Directors: Dr. E. S. Bowman, Dr. A. L. Hagebock, B. L. Schmidt. Present membership, 30. Member A. A. A.

Automobile Club of Dayton.—George Andrews, Sec., Dayton, O.

Automobile Club of Delaware County.

—Dr. H. H. Stoever, Sec., Chester, Pa. Member A. A. A.

Automobile Club of Denmark.—8 Ostersgade, Copenhagen, Denmark.

Automobile Club of Detroit.—Garvin Denby, Sec., Pasadena Apts., Detroit, Mich. Member A. A. A.

Automobile Club of Elmira.—E. W. Gleckler, Sec., Elmira, N. Y.

Automobile Club of El Reno.—W. P. De Varney, Sec., El Reno, Okla.

Automobile Club of Ferrare.—2 Via Teatini, Ferrare, Italy.

Automobile Club of Florence.—Via del Prato, Italy.

Automobile Club of France.—Society for encouraging the development of the automobile industry in France; founded in 1895. The club is managed by a committee of 50 members elected for five years by the annual general assembly, and which selects from its members the honorary presidents, the president, three vice-presidents, two secretaries general, one assistant secretary, a treasurer and five members who constitute the administrative council. For the years 1906-1907, the leading officers are: President, Baron de Zuylen de Nyvelt de Haar; vice-presidents, Count de Dion, Henri Menier and Edouard Muller; secretaries general, Alfred de Rollepote and Louis Dumontpallier. The club now numbers 3,000 members. Following are the American members of the A. C. F., with the date of their election and present addresses:

1901, Frederick Allen, 63 Wall St., New York City; 1907, George Arents, Jr., 524 Fifth Ave., New York City; 1907, Edward Bement, 31 E. 24th St., New York City; 1895, James Gordon Bennett, 104 av. des Champs-Élysées, Paris, France; 1896, Hart O. Berg, 152 rue du Faubourg Saint-Honoré, Paris, France; 1900, David W. Bishop, Union Club, New York; 1896, Ferdinand Blumenthal, 57 E. 56th St., New York City; 1907, George Blumenthal, 23 W. 53rd St., New York City; 1900, Albert C. Bostwick, Mamaroneck, N. Y.; 1900, Martin Bradley, Jr., 4 Chesterfield Gardens, London, W.; 1898, Edward Brandus, 391 Fifth Ave., New York City; 1900, Henry Cachard, Supreme Court, New York City; 1906, Harrison K. Caner, 1707 Walnut St., Philadelphia, Pa.; 1905, Hamilton Carhartt, Jr., 843 Jefferson Ave., Detroit, Mich.; 1903, Royal Phelps Carroll, 41 E. 49th St., New York City; 1900, John Cauldwell, Century Club, New York; 1905, Gardner K. Clark, Jr., Union League Club, New York; 1905, Charles Deering, 7 Monroe St., Chicago, Ill.; 1905, James Deering, 7 Monroe St., Chicago, Ill.; 1907, George William Dickinson, 14 E. 60th St., New York City; 1907, William J. English,

616 Ashland Block, Chicago, Ill.; 1907, Alessandro Fabbri, 11 E. 62nd St., New York City; 1907, Ernesto G. Fabbri, 11 E. 62nd St., New York City; 1902, William B. Osgood Field, 645 Fifth Ave., New York City; 1905, Henry Clay Frick, Penn & Homewood Aves., Pittsburg, Pa.; 1905, B. Spalding de Garmendia, 27 E. 43rd St., New York City; 1906, Elbert H. Gary, 71 Broadway, New York City; 1906, Charles G. Gates, Waldorf-Astoria, New York City; 1904, Eugene Glaenger, 1425 Broadway, New York City; 1907, Frank Jay Gould, 834 Fifth Ave., New York City; 1907, George Jay Gould, 857 Fifth Ave., New York City; 1902, Jackson Gouraud, 439 Madison Ave., New York City; 1902, Benjamin Guggenheim, 15 E. 72nd St., New York City; 1902, William Guggenheim, 833 Fifth Ave., New York City; 1906, General Frederick Robert Halsey, 22 W. 53rd St., New York City; 1906, William Randolph Hearst, 28th St. & Lexington Ave., New York City; 1907, Edward Nathaniel Herzog, 22 E. 73rd St., New York City; 1902, Max Herzog, 74 E. 56th St., New York City; 1901, Peter Cooper Hewitt, 11 Lexington Ave., New York City; 1901, Eugene Higgins, 1 Madison Ave., New York City; 1903, William S. Hilles, The Washington, Mt. Vernon Place, Baltimore, Md.; 1905, Sydney E. Hutchinson, 325 Walnut St., Philadelphia, Pa.; 1900, James H. Hyde, 18 rue Adolphe-Yvon, Paris, France; 1906, John Herbert Johnston, 18 Washington Sq., New York City; 1905, Eben D. Jordan, 46 Beacon St., Boston, Mass.; 1901, Foxhall Keene, care J. S. Morgan & Co., 22 Old Broad St., London; 1904, William B. Leeds, 71 Broadway, New York City; 1900, Jean Baptiste Martin, 212 Fifth Ave., New York City; Dr. Charles Wood McMurtry, 812 Fifth Ave., New York City; 1905, Clarence Moore, Metropolitan Club, Washington, D. C.; 1906, Theodore W. Myers, 21 W. 46th St., New York City; 1901, Clarence A. Postley, 817 Fifth Ave., New York City; 1900, William J. Reid, 1426 North Delaware St., Indianapolis, Ind.; 1897, Gaston Rheims, 160 Fifth Ave., New York City; 1907, Peter Williamson Roberts, Philadelphia Club, Philadelphia, Pa.; 1903, J. Roosevelt Roosevelt, Hyde Park, New York; 1907, Ernest M. Schelling, 604 Fifth Ave., New York City; 1904, Louis Sherry, Fifth Ave. & 44th St., New York City; 1905, Maurice C. Sternback, 40 Wall St., New York City; 1906, James Stillman, 9 E. 72nd St., New York City; 1905, Alvin Louis Strasburger, 128 W. 77th St., New York City; 1907, Isidor Strauss, 2547 Broadway, New York City; 1906, W. K. Vanderbilt, 10 rue Lerou, Paris, France; 1901, William Kissam Vanderbilt, Jr., Grand Central Depot, New York City; 1900,

Thomas F. Walsh, Washington, D. C.; 1896, Rodman Wanamaker, 127 av. des Champs-Élysées, Paris, France; 1899, John B. Warden, villa Warden, chemin de Fabrons, Nice; 1906, Henry R. C. Watson, Union League Club, New York City; 1904, Henri Wertheim, 2 E. 67th St., New York City; 1906, Ernest Wiltsee, Trinity Bldg., 111 Broadway, New York City; 1896, General Edward F. Winslow, U.S. Army, 28 rue de Madrid, Paris, France; 1899, Benjamin Woodward, University Club, New York.

Automobile Clubs of France.—Correspondents of the A. C. F.:

Algiers: Automobile Club of Algeria, 23 Boulevard Carnot, Algeria.

Amiens: A. C. of Picardy and Aisne, 58 Rue des Trois Cailloux.

Avignon: A. C. Vauclusien, Café Tailleurs, Place de l'Horloge.

Bazeilles: A. C. Ardennais, Ardennes.

Belfort: A. C. of Belfort.

Beziers: A. C. Biterrois.

Bordeaux: A. C. Bordelais, 2 Place de la Comedie.

Bourges: A. C. of the Centre, 24 Rue Notre-Dame.

Brest: A. C. Brestois, 18 Rue de Siam.

Cannes: A. C. of Cannes, 1 Boulevard Jean-Hibert.

Clermont-Ferrand: A. C. of Auvergne, 18 Place de Jaude.

Compiègne: A. C. of the Oise.

Dijon: A. C. of Bourguignon, 8 Place Darcy.

Draguignan: A. C. of the Var.

Epinal: A. C. Vosgien, 16 Rue Jeanne d'Arc.

Grenoble: A. C. Dauphinois, 6 Place de La Halle.

La Rochelle: A. C. Rochelais.

Le Mans: A. C. of Sarthe, 7 Boulevard René-Levasseur.

Lons-le-Saunier: A. C. Jurassien, Maison Devaux, Rochettes.

Lyons: A. C. and Bicycle C. of Lyons, 2 Palais Grillet.

Lyons: A. C. of the Rhone, 8 Rue Boissac.

Marseilles: A. C. of Marseilles, 52 Rue Paradis.

Montpellier: A. C. of Herault, 2 Rue Moguelone.

Nancy: A. C. Lorrain, 12 Place Stanislas.

Nice: A. C. of Nice.

Nîmes: A. C. of the Gard, 1 Boulevard Amiral-Courbet.

Oran: A. C. of Oranie, 3 Boulevard Seguin.

Pan: A. C. Bearnais, 17 Rue de la Prefecture.

Perigueux: A. C. of Dordogne, 8 Place du Quatre Septembre.

Poitiers: A. C. Poitevin, 32 Rue Carnot.

Reims: A. C. of the Marne.

Roubaix: A. C. of the North of France, 4 Rue de la Gare.

Rouen: A. C. Normand, 4 bis Boulevard d'Orleans.

Saint-Etienne: A. C. Forezien.

Salon: A. C. of Salon, Place de la Grippe.

Strasbourg: A. C. of Alsace.

Toulouse: A. C. Toulousain, 6 Rue neille.

Toulouse: A. C. Toulousain, 6 Rue Darquier.

Tours: A. C. of Touraine, 27 Rue Victor-Hugo.

Troyes: A. C. of the Aube, 6 Rue de la Tour-Boileau.

Verdun: A. C. of the Meuse.

Versailles: A. C. of the Seine-et-Oise, 1 Avenue de Saint-Cloud.

Automobile Club of Genoa.—18 Spianata Acquasola, Genoa.

Automobile Club of Germantown.—Mark B. Reeves, Sec., 141 Phil-Ellena St., Germantown, Pa. Member A. A. A.

Automobile Club of Germany ("Kaiserlicher Automobil Club").—16 Leipziger-platz, Berlin, W. 9, Germany. President, H. Von Ratibor; secretary general, Von Grandenstein.

Automobile Club of Great Britain and Ireland.—119 Piccadilly, London. President, A. Stanley.

Automobile Club of Hartford.—Hartford, Conn. G. K. Dustin, Sec. Member A. A. A.

Automobile Club Hongrois.—Palais Torley, 16 Sandorfehez-utca, Budapest, Hungary.

Automobile Club of Hudson County.—Clinton and Crescent Aves., Jersey City, N. J. Pres., J. V. Z. Anthony; Vice-Pres., John P. Landrine; Sec., F. D. Laughlin. Organized "for the encouragement and development of the automobile for pleasure purposes; to guard against adverse or unjust legislation; to maintain the lawful rights and privileges of owners or users of all forms of self-propelled pleasure vehicles, etc." Chairmen of Committees: J. H. Edwards, H. T. Pond. Former presidents: Dr. L. A. Opydyke, J. H. Edwards. Member A. A. A.

Automobile Club of Illinois.—407 Monadnock Bldg., Chicago, Ill. Pres., Harry Wilkinson; Sec., M. Matthews. Organized 1903 as a private owners' club. Charter members, 83.

Automobile Club of Indiana.—G. E. Varney, Sec. and Treas., Indianapolis, Ind.

Automobile Club of Italy.—5 Via Plana, Turin, Italy.

Automobile Club of Kansas City.—W. P. M. Stevens, Sec., 502 American Bank Bldg., Kansas City, Mo. Member A. A. A.

Automobile Club of Macon.—Chas. H.

Payson, Sec., Macon, Mo. Member A. A. A.

Automobile Club of Maine.—Howard Winslow, Sec., Portland, Me.

Automobile Club of Marlborough.—J. F. J. Otterson, Sec., Marlborough, Mass.

Automobile Club of Maryland.—F. W. Darling, Sec., Pikesville, Md.

Automobile Club of Mattoon.—George X. Chuse, Sec., Mattoon, Ill. Member A. A. A.

Automobile Club of Milan.—Piazzale Stazione Nord, Milan, Italy.

Automobile Club of Minneapolis.—Sewall D. Andrews, Sec., 309 New York Life Bldg., Minneapolis, Minn.

Automobile Club of Moscow.—Boulevard Novinski, Moscow, Russia. President, R. von Meck; secretary general, J. Treffersfeld.

Automobile Club Neerlandais.—Nassauplain, Hague, Holland. President, B. Von Hogelanden; secretary general, G. Venema.

Automobile Club of New Britain.—New Britain, Conn. W. L. Hatch, Sec. Member A. A. A.

Automobile Club of Newburgh.—Geo. S. Weller, Sec., Newburgh, N. Y. Member A. A. A.

Automobile Club of New Jersey.—G. F. Bailey, Sec., Tribune Bldg., New York City. Member A. A. A.

Automobile Club of New Orleans.—Sam Stone, Jr., Sec., 818 Common St., New Orleans, La.

Automobile Club of Ogden.—A. V. Withee, Sec., Ogden, Utah.

Automobile Club of Oneida.—John Maxwell, Sec., Oneida, N. Y.

Automobile Club of Owatonna.—Owatonna, Minn. Dr. A. B. Stewart, Sec. Member A. A. A.

Automobile Club of Philadelphia.—Member of the Pennsylvania Motor Federation and the A. A. A. Organized for the protection of its members from vexatious and unwise legislation, to promote and encourage the building of good roads, the issuance of road maps and erection of signboards. Alfred N. Chandler, Pres.; Henry J. Roelofs, Vice-Pres.; S. Boyer Davis, Sec.; G. J. Gundlinger, Treas. & Asst. Sec. Office of the Secretary, 1409 Walnut St. Directors: Alfred N. Chandler, Henry H. Roelofs, George B. Linnard, Jacob J. Seeds, Isaac Starr, S. Boyer Davis, John R. Wiggins. Chairmen of Standing Committees: City Streets and Ordinances, Stedman Bent, 306 Girard Trust Bldg.; Country Club and Inns, Jacob J. Seeds, 115 N. 7th St.; Entertainment, Dr. A. D. Whiting, 1523 Spruce St.; Increased Membership, George B. Linnard, 607 Chestnut St.; Membership, Isaac Starr, 240 Dock St.; Routes and Sign Posts, Powell Evans, 517 Arch St.; Runs and Tours, S. Boyer

Davis, 1326 Land Title Bldg.; State Legislation, John R. Wiggins, 717 Heed Bldg.; Toll and Country Roads, Henry H. Roelofs, 1210 Brown St.; Township Regulations, Clark Dillenbeck, Chestnut Hill, Philadelphia.

Automobile Club of Pittsburg.—Paul C. Wolff, Sec., Baum & Beatty Sts., Pittsburg, Pa. Member A. A. A.

Automobile Club of Red Wing.—Red Wing, Minn. Walter B. Sheldon, Sec. Member A. A. A.

Automobile Clubs, Regional, of France (Federation of).—An organization designed to protect the interests of the provincial automobile clubs, to aid in obtaining common advantages for them, to create a permanent union between them, and to contribute to the development of touring and automobilism in France. The principal quarters of the Federation are at 8 Place de la Concorde. The president is Prince d'Arenberg.

Automobile Club of Rockford.—H. W. Dickerman, Sec., Rockford, Ill.

Automobile Club Roman.—Grand Hotel du Boulevard, Boulevard Elisabeth, Bucharest, Roumania. President, Prince G. V. Bibesco; secretary general, J. Camarashesco.

Automobile Club of Russia.—15 Spelernaia, Saint Petersburg, Russia. President, W. Goudvitch; secretary general, P. Boechel.

Automobile Club of St. Cloud.—St. Cloud, Minn.—J. C. Cotton, Sec. Member A. A. A.

Automobile Club of St. Joseph.—St. Joseph, Mo. H. D. Todd, Sec. Member A. A. A.

Automobile Club of St. Louis.—901 Security Bldg., St. Louis, Mo. Pres., Alex Euston; Vice-Pres., Dr. E. M. Seseney; Sec. and Treas., Sam D. Capen. Former presidents: Geo. H. Walker and A. B. Lambert.

Automobile Club of St. Paul.—H. S. Johnson, Sec., 911 Pioneer Press Bldg., St. Paul, Minn.

Automobile Club of San Jose.—B. D. Merchant, Sec., San Jose, Cal.

Automobile Club of Schnectady.—A. F. Knight, Sec., Schnectady, N. Y. Member A. A. A.

Automobile Club of Sheboygan.—A. C. Prescott, Sec., Sheboygan, Wis.

Automobile Club of So. California.—Chas. B. Hopper, Sec., 402 Laughlin Bldg., Los Angeles, Cal. Member A. A. A.

Automobile Club of Spain ("Real Automobile Club de Espana").—70 Alcala, Madrid, Spain.

Automobile Club of Springfield.—F. P. Strout, Sec., Hotel Worthy, Springfield, Mass. Member A. A. A.

Automobile Club of Stamford.—Stamford, Conn. Dr. Dean Foster, Sec. Member A. A. A.

Automobile Club of Syracuse.—Forman Wilkinson, Sec., 701 S. A. & K. Bldg., Syracuse, N. Y. Member A. A. A.

Automobile Club of Trenton.—Edward S. Wood, Sec., Trenton, N. J.

Automobile Club of Troy.—Dr. A. Buchanan, Sec., Troy, N. Y. Member A. A. A.

Automobile Club of Turin.—5 Via Plana, Turin, Italy.

Automobile Club of Utica.—Robert M. Hunt, Sec., Utica, N. Y. Member A. A. A.

Automobile Club of Venetien.—5 Via San Pietro, Padua, Italy.

Automobile Club of Vermont.—W. D. Woolson, Sec. and Treas., Springfield, Vt.

Automobile Club of Washington.—Washington, D. C. Member A. A. A. Robert B. Caverly, Pres.; C. E. Wood, Vice-Pres.; O. J. de Moll, Treas.; Le Roy Mark, Sec., 1302 G St., N. W.

Automobile Club of Wayne County.—Walker Land, Sec., Richmond, Ind.

Automobile Club of Wilkinsburg.—Dr. W. C. Cook, Sec., 415 Center St., Wilkinsburg, Pa. Member A. A. A.

Automobile Club of Winona.—Winona, Minn. Theodore Wold, Sec. Member A. A. A.

Automobile Dealer & Repairer.—Published the middle of each month by The Motor Vehicle Publishing Co., 24 Murray St., New York City. M. T. Richardson, Pres. and Treas.; F. R. Whitten, Sec. and Advt. Mgr.; A. A. Hill, Editor.

Automobile Dealers' Association of Pittsburg, The.—5919 Baum St., Pittsburg, Pa. Pres., W. N. Murray (Standard Automobile Co.); Vice-Pres., W. H. LaFountain (Atlas Automobile Co.); Sec., A. L. Banker (Banker Bros. Co.); Treas., C. P. More (Keystone Automobile Co.). Incorporated Aug. 20, 1907, with a capital of \$5,000, to "promote the automobile trade and to accommodate their patrons in every way possible." Show Committee: W. N. Murray, W. H. LaFountain (chairman), Thos. I. Cochran (Mgr.), Earl Kiser. The Association comprises 18 Pittsburg dealers, viz.: Allegheny Automobile Co., American Automobile Co., Arlington Motor Car Co., Atlas Automobile Co., Auto Repair Co., Banker Bros. Co., Belden Motor Car Co., Bellefield Motor Co., Central Automobile Co., Colonial Automobile Co., Fort Pitt Automobile Co., Hiland Automobile Co., Iams Automobile Co., Keystone Automobile Co., Liberty Automobile Co., Standard Automobile Co., Winton Motor Carriage Co., Wilkinsburg Automobile Co. The club rooms are available for motorists, and a license bureau is maintained, with Notary, where licenses can be obtained.

Automobile Co.—112 Tulane Ave., New Orleans, La. (Locomobile, Winton.)

Automobile Co.—195 Paterson St., Paterson, N. J. (Winton, Orient.)

Automobile Co.—365 Fell St., San Francisco, Cal. Garage.

Automobile Co. of Hamilton, Ltd.—York and Queen St., Hamilton, Canada. (Ford, Russell.)

Automobile Depot, Inc.—215 W. 48th St., New York City. Garage.

Automobile Equipment Co.—264 Jefferson Ave., Detroit, Mich. Mfrs. aprons and curtains (storm), cement (tire), horns, hydrometers, jacks, soaps (auto body), soap (hand), tops (auto).

Automobile Exchange & Storage Co.—133-5-7-9 W. 38th St., New York City. Dealers in second-hand foreign and American cars. Est. 1900. Cap. \$100,000. John H. Robertson, Pres. and Gen. Mgr.; E. J. Vass, Sec.; Geo. H. Robertson, Treas.; Geo. H. Robertson, Mgr. garage and sales dept.; Ed. Soper, Mgr. repair dept.; Wm. Sherwood, Mgr. office. Garage (73 cars). Make a specialty of overhauling and repairing Mercedes, Renault, C. G. V. and Panhard cars, with complete list of parts for same.

Automobile Exchange & Supply Co.—18 Sabin St., Providence, R. I. Garage.

Automobile Exchange, The.—Salt Lake City, Utah. (Jackson.)

Automobile Exchange.—Corner Ave. D and 20th St., Birmingham, Ala. (Ford, Pope-Waverley, National, Baker.)

Automobile Exchange.—1545 Michigan Ave., Chicago, Ill. Garage.

Automobile & Garage Co.—Paducah, Ky. (Queen, Reo.)

Automobile Garage & Machine Shop.—Caven St., Ligonier, Ind. Garage.

Automobile Garage & Repair Co.—Kalamazoo, Mich. Garage.

Automobile Garage & Repair Co.—Painesville, Ohio. (Winton.)

Automobile Gasolene Co.—722 So. Theresa Ave., St. Louis, Mo. Supplies.

Automobile Hack Co.—115 State St., Savannah, Ga. Repairing.

Automobile Hire & Sales Co.—231 W. 40th St., New York City. Garage.

Automobile & Machinery Co.—221 2d St., Macon, Ga. (Buick, Pope-Waverly, Autocar, Oldsmobile, Pope-Toledo.)

Automobile Maintenance Co.—1239 Fulton St., Brooklyn, N. Y. (Second-hand cars.)

Automobil und Motorfahrzeugfabrick.—Greifswalderstrasse 140, Berlin, Germany. Mfrs. motors (auto and motor-merical. (A. & P. tractors). cycle).

Automobile Owners Supply Depot.—1655 Broadway, New York City. Sup-

ply house. Full line of accessories. Cap. \$10,000. Est. 1906. F. O. Buell, Pres.; C. D. W. Cole, Sec. and Treas.; C. A. W. Farrington, Vice-Pres.

Automobile Palace.—152 W. Jackson Blvd., Chicago, Ill. Garage.

Automobile Parts & Equipment Co.—2224-34 Michigan Ave., Chicago, Ill. Mfrs. automobiles, gas. Garage.

Automobile Renting Co.—St. Louis, Mo. (Atlas.)

Automobile Repair Co.—Kossuth St., Bridgeport, Conn. (Knox.)

Automobile-revue du littoral L'.—Published at 27 avenue de la Gare, Nice, (Alpes-Maritimes) France.

Automobile Road Map Co.—428 Lafayette St., New York City. Mfrs. and dealers road maps, New York State, New Jersey, New England States, Pennsylvania, Maryland and Delaware. Cap. \$10,000. Est. 1906. M. Joly, Pres. and Treas.; C. M. Crocker, Sec.

Automobiles Aries, Société Anonyme.—104 rue Richelieu, Paris, France. Mfrs. automobiles, gas. commercial (Aries trucks).

Automobile Service Co.—1812 Harney St., Omaha, Neb. Garage.

Automobiles Eugene Brillé.—60 blvd. Péreire, Paris, France. Mfrs. automobiles, gas. commercial (E. Brillé trucks).

Automobiles "Gem."—24 rue de Bacon, Courbevoie (Seine), France. Mfrs. automobiles, gas. (Gem.)

Automobiles Industriels (Société Generale des).—3 rue Vignon, Paris, France. Mfrs. automobiles, gas. commercial.

Automobile Sales Corp. of New York.—1665 Broadway, New York City. (American Mercedes.)

Automobile Schools of America.—742 7th Ave., New York City. (Auto repairing.) Instruction in driving, repairing etc., for chauffeurs and owners. Chauffeurs supplied.

Automobile Specialty Co.—913 Orange St., Wilmington, Del. Supplies.

Automobile Specialty Co.—509 Wiloughby Bldg., Chicago, Ill. Mfrs. valve lifters.

Automobile Station.—42-48 Pleasant St., Manchester, N. H. Garage; repairs; supplies.

Automobile Stor. & Trading Co.—97 Central Ave., Albany, N. Y. (Columbus, Oldsmobile.)

Automobile & Supply Co.—24 Temperance St., Toronto, Canada. (Babcock, Stoddard-Dayton, Pierce-Arrow, Franklin, Royal, Reo, Pope-Hartford.)

Automobile & Supply Corp.—67-9 Broadway, New Haven, Conn. (Buick, Locomobile.)

Automobile Supply Mfg. Co.—139-47 Emerson Pl., Brooklyn, N. Y. Mfrs.

cement (tire), eye shields, horns, lamps, tubing (flexible).

Automobile Tire Co.—1578 Broadway, New York City. Vulcanizing and tire repairing.

Automobile Topics (The only weekly published for Automobile Owners).—Published weekly by Automobile Topics, Inc., Times Building, N. Y. E. E. Schwarzkopf, Pres.; Theo. Draz, Treas.; W. E. Baldwin, Sec.; S. Wallis Merrihew, Vice-Pres. Editorial dept: S. Wallis Merrihew, Editor; W. A. Smith, W. R. Gerard, Le Roy Cook. Business dept: Theo. Draz, W. E. Baldwin. Automobile Topics is a consolidation of Automobile Topics and Motor Traffic (monthly). Cable Address: Autotopics, N. Y. Telephone 3623-3624 Bryant. Subscription \$2 a year; 10 cents a copy, Foreign \$4 a year.

Automobile Transit Co.—Milwaukee, Wis. (Gale.)

Automobile Utilities Co.—9 Motor Mart, Boston, Mass. Mfrs. inner tubes.

Automobilia.—Published at 108 blvd. de Clichy, Paris, France.

Automobilia and Anglo-Saxon Herald.—Published at 108 blvd. de Clichy, Paris, France.

Automobilia, Ltd.—532 Oxford St., London, W., England. Mfrs. pneumatic tires, wearing apparel (coats).

Automobilism.—The science which treats of automobiles and their structure, operation and applications, and of other matters pertaining directly or indirectly thereto.

Automobilist.—A person conversant with the structure and mechanism of an automobile, and who is experienced in driving it.

Automobile und Motorenfabrik vorm. Otto Weisse und Co.—140 Greifswalderstrasse, Berlin, Germany. Mfrs. automobiles, gas.

Automobile-Revue.—Published at 29 blvd. Extérieur, Berne, Switzerland.

Automobil Welt.—Published at 16 Lindenstrasse, Berlin (Allemagne), Germany.

Automobilwerke Leipzig.—Carl Heine Strasse 35, Leipzig-Platwitz, Germany. Mfrs. motors (auto).

Automation L'.—Published at 2 bis, rue Edouard Detaille, Paris, France.

Automotor Journal, The.—Published by F. King & Co., Ltd., 44 St. Martin's Lane, London, W. C., England. (Weekly.)

Automovilismo Ilustrado, El.—24 Muntaner, Barcelona, Spain.

Autonautique L'.—Published at 4 bis avenue Malausséna, Nice (Alpes-Maritimes), France.

Autoteil Gesellschaft.—Französischer-

strasse 8, Berlin, Germany. Mfrs. magnetos (high tension), clutches.

Aveling & Porter.—Rochester, England. Mfrs. automobiles, steam, com-
Avey, A. P.—Sec. Mianus Motor Works, Cos Cob, Conn.

Averill, H. R.—Sales Mgr. York Motor Car Co., 240 N. George St., York, Pa.

Avery, Edgar C.—Sec., sales and credit Mgr., Avery Portable Lighting Co., 18-22 Martin St., Milwaukee, Wis.

Avery, F. E.—1199 Franklin Ave., Columbus, O. (Packard, Franklin, Winton.) Repairing.

Avery, H. W.—Mgr. and Treas., Avery Stamping Co., 5207 Lakeside Ave., N. E., Cleveland, O.

Avery, John H.—Vice-Pres. Detroit Steel Products Co., 91 E. Fort St., Detroit, Mich.

Avery, John.—Pres. Ashton Valve Co., 271 Franklin St., Boston, Mass.

Avery, Percy C.—Pres., Treas and Gen. Mgr. Avery Portable Lighting Co., 18-22 Martin St., Milwaukee, Wis.

Avery Portable Lighting Co.—18-22 Martin St., Milwaukee, Wis. Mfrs. auto gas. tanks and tire inflating tanks for automobiles. Member M. A. M. A. Cap. \$10,000 (paid in) \$20,000 surplus. Est. April 1, 1906. Percy C. Avery, Pres., Treas. and Gen. Mgr., Edgar C. Avery, Sec., Sales and Credit Mgr.; Geo. E. Burnham, Vice-Pres.

Avery Stamping Co.—5207 Lakeside Ave., N. E., Cleveland, O. Mfrs. auto tanks (seamless), brake drums, gear cases, gear shields, pressed and stamped steel parts of all kinds—16 ga. to 1 inch thick. Cap. \$500,000. Est. 1885. H. W. Avery, Mgr. and Treas.

Aviator.—A machine for self-support and propulsion through the air; a form of aeroplane.

Aviation.—That portion of aeronautics which pertains to aerial locomotion by purely mechanical means, without the aid of any gas lighter than the air. The apparatus employed in mechanical flight, and commonly called "flying machines" are of the following types: (1) The "helicopter," which consists of one or more helices or screws on a vertical or nearly vertical axis; (2) the "aeroplane," the types of which are innumerable, and which consists, in principle, of one or more planes, the sustentation and lateral progression of which are obtained either by the effect of their own gravity properly compounded with the resistance of the air, or by the action of one or more screws with a horizontal or nearly horizontal axis; (3) the "orthopter," or mechanical bird, which is sustained and propelled by two or more beating wings.

Avis & Son, G. F.—Hudson, Mich (Buick.)

Avis, Jno. J.—Sec. and Treas. Geo. P. Moore Co., Inc., 332 Broadway, New York City.

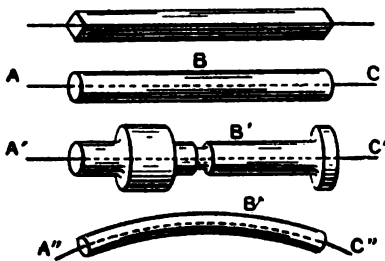
Avondale Auto Supply Co.—Reading Road and Windham Ave., Cincinnati, O. Jobbers and dealers in automobile supplies.

Avon India Rubber Co., Ltd.—Melksham (Wiltshire), England. Mfrs. pneumatic tires, non-skid bands.

Avon Motor Mfg. Co.—Keynsham, Bristol, England. Mfrs. automobiles, gas. (Avon.)

Axiom Carbureter Mfg. Co., The.—106 E. 28th St., New York City. Mfrs. carbureters.

Axis.—The center line of a body, or the line about which a figure or solid is symmetrical. For example, the axis of a cylindrical bar of metal is the theoretical line which unites the center of the successive circles of the same or different diameters. By derivation, an axis



in mechanics is a cylindrical piece around which another piece, such as a wheel, lever, etc., can take on a rotary motion and which it serves as a line of centers. It is an immovable piece—a fixed shaft. A solid or hollow spindle upon which a wheel turns, for example, is an “axis.” In the figure, A, A' and A'' represent the axis of the shafts B and B' and the curved bar B''.

Axle.—In almost all automobiles the power is applied to the rear axle and wheels, while the steering is effected by the front wheels, which, for this purpose, are pivoted at the end of an axle that, unlike the front axle of a horse-drawn vehicle, is stationary.

In all motor-cars of standard design, the front axle, which is immovably attached beneath the body of the vehicle, is either of I-beam or tubular section, and is usually “dropped” in the center so that it may be the lowest part of the mechanism and thus receive the blows of road-objects, which, in event of their coming into contact with the crank-case and fan, might cause very serious damage. Near each end of the axle is a flat “seat” or “saddle” for the reception of the spring, and at each extreme end, and forged solid with it, is a jaw or yoke in

which is pivoted the steel spindle (Fig. 2A) upon which the road-wheel revolves. Forming a single-piece forging with the pivots (Fig. 2B) are two short steering arms (Fig. 2C), which are connected to each other by a drag-link. A lever forged with the steering arm, or brazed and pinned to a shoulder on the pivot of the right-hand side of the car, is connected, through an arm, with the gear at the base of the steering pillar, so that a movement of the drag-link produced thereby moves the pivoted ends of the axle and the wheels to correspond. Since the arms would, if they stood at right angles to the axle-ends, move each pivoted spindle through an equal angle, and the wheels would be parallel at all times, the steering arms are inclined toward each other and the drag-link made shorter than the distance between the axle pivots. If the drag-link be in front of the axle, a position preferred by some manufacturers, the steering arms are inclined outward. The result of such an arrangement is that when the drag-link is moved, one of the wheels swings through a greater angle than the other, and that the difference between the angle of each arm and the stationary part of the axle increases with a greater movement of the drag-link.

The steering knuckles in use at present are of two principle types: (1) a spindle and pivot of T-shape (like that shown in Fig. 2) and called the “Elliott pivot” and an axle with yoke or jaw ends; and (2) a pivot of L-shape and an axle with vertical hubs. In the latter, frequently termed the “Lemoine pivot,” the steering arm goes on the lower end of one pivot, while the other pivot carries a combined steering arm and lever. The outer end of the steering arm is provided with a ball to fit in the socket on the connecting-rod of the steering mechanism.

Tubular front axles are always made in three parts, consisting of cold-drawn, seamless tubing, bent to shape, and fitted with the usual steering yokes and pivots. Fig. 1 shows a typical forged axle of I-beam section of the Locomobile car.

Rear axles may be divided into two types, viz., “dead” axles and “live” axles. The dead axle is made of I-beam section or of steel tubing and is employed with the “jack-shaft” and double chain drive. It is provided with spindles which are in a piece with it, and upon which the wheels revolve. Power is transmitted through the intermedium of bevel-gears to the jack-shaft, or shaft passing across the car and carrying at its ends the sockets by which the road-wheels are driven. Fig. 2 represents a typical dead axle, a single piece of drop-forging used on the Locomobile car.

In the live axle type the rear wheels are connected to the axle-shaft and revolve with it, and the axle proper is surrounded by a non-revoluble steel tubular casting which is secured to the rear

extremity of the hub. By means of such an arrangement the whole weight of the car is received by the tubular casing, and the strain of the transmission solely comes upon the differential shaft. If,



Fig. 1

springs, and which not only relieves the driving part from the weight of the car, but also supports the differential and driving mechanism. In this casing run the two ends of the differential axle, and in the center of the cas-

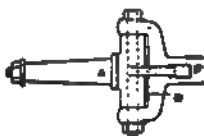


Fig. 2

on the contrary, the wheels are mounted direct, the entire weight comes upon the shaft, the result of which is the producing of excessive friction, and sometimes a strain and fracture of the shaft.

Fig. 4 illustrates a live axle of the Rambler car. Here A and A are the live shaft bearings in the differential case; BB, the ball-bearings supporting the differential; C, the end of the live shaft



Fig. 3

ing is the differential itself and its housing. On the differential is bolted the bevel, sprocket, or worm-wheel, which drives it from the gear-box by means of a bevel, sprocket or worm. (Examples

keyed in the wheel-hub; D, the inner member of the roller-bearing in the wheel-hub; E, the outer member of the same; F, the expanding brake-ring; G, the lever for setting the brake-ring;

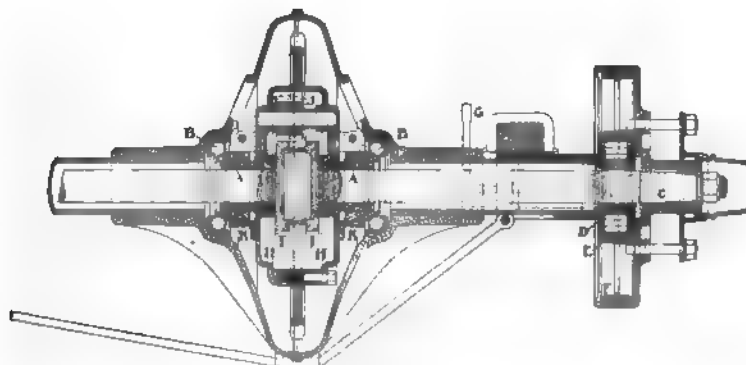


Fig. 4

of the bevel drive are found in the Peerless, Darracq, Autocar, Packard and Renault; of the sprocket drive in the Olds, Reo, Cadillac and Buick; and of the worm-drive in the Dennis and Garrard.)

The road-wheels are sometimes mounted directly on the ends of the differential axle, but most usually the hubs revolve on bearings outside the end of the tubular axle, while the shaft of the differential runs through the latter to the exterior, where it is coupled to the

HH, the differential case in halves, joined in the center; H, the spur-gears on the live shaft; J, the equalizing gear of the differential; and KK, the rings for adjusting the bearing BB.

Axle, Blind.—Same as "dead axle." See Axle.

Axle-box.—The bearing in which an axle revolves

Axle, Cardan.—A universally jointed axle. See Cardan.

Axle, Dead.—An axle which does not rotate, and has bearings at each end upon which the wheels revolve. See Axle.

Axle, Divided.—A type of live axle which is divided into two parts in order that a differential gear may be fitted between them. See Axle.

Axle, Floating.—A type of rear axle, so-called because it "floats," so to speak, in the axle-casing, by which the weight of the machine is supported and upon which the wheel revolves. See Axle.

Axle-journal.—The end of an axle on which a wheel turns. It is usually made of tempered steel, and terminates in a thread on which a nut screws, in order to hold the wheel in place. See Spindle.

Axle, Live.—An axle that revolves with the wheels, instead of the wheels turning upon it. See Axle.

Ayer Automobile Station.—E. Main

St., Ayer, Mass. Garage; repairing; supplies.

Ayer, L. H., Jr.—Mgr. Gate City Motor Car Co., Sec. Ayer Mfg. Co., 815 Main St., Keokuk, Ia.

Ayer, L. H.—Pres. Ayer Mfg. Co., 815 Main St., Keokuk, Ia.

Ayer Mfg. Co.—815 Main St., Keokuk, Ia. Est. 1902. Cap. \$10,000. Inc. 1906. L. H. Ayer, Pres.; L. H. Ayer, Jr., Sec. Automobile repairing.

Ayers, E. B.—Supt. Repair Dept., Wyckoff, Church & Partridge, Broadway and 56th St., New York City.

Ayers & Son, A.—Nyack, N. Y. Mfrs. motor boats.

Ayers Gasolene Engine Works.—Saginaw, Mich. Mfrs. motors (gas., marine).

Azh, U. L.—Owner Never Miss Spark Plug Co., 321-23 Michigan Ave., E., Lansing, Mich.

B

B.—Symbol for "magnetic induction."

Bi.—Symbol for bismuth.

b. h. p.—Abbreviation of "brake horsepower."

B. & B. Co.—97 Rockview Ave., Plainfield, N. J. Mfrs. wire terminals.

B. & H. Motor Car Co.—147-51 W. 49th St., New York City. Est. 1907. Walter C. Burbank, Pres. and Gen. Mgr.; Francis S. Hoyt, Vice-Pres.; Francis C. Hoyt, Sec. and Treas. Garage, 250 cars; repairing; all supplies.

B. & J. Mfg. Co.—3985 Cottage Grove Ave., Chicago, Ill. Mfrs. spark plugs, electric switches.

Baakmann, Johannes.—Assen, Holland. Mfrs. motorcycles.

Babb, W. D.—820 Cass St., La Crosse, Wis. (Pope-Hartford.)

Babbitt's metal.—A soft, white alloy of tin, copper and antimony, extensively used for plain bearings. A good composition is tin 10 parts, copper 1 part and antimony 1 part.

Babcock, F. A.—Pres. and Gen. Mgr. Babcock Electric Carriage Co., 226-42 W. Utica St., Buffalo, N. Y.

Babcock, F. A., Jr.—Sec. and Mgr. of Sales, Babcock Electric Carriage Co., 226-42 W. Utica St., Buffalo, N. Y.

Babcock, G. H.—Pres. and Treas. H. H. Babcock Co., Factory Square, Watertown, N. Y.

Babcock, H. J.—Treas. American Motor Truck Co., Caledonia St., Lockport, N. Y.

Babcock, J. P.—Boonville. N. Y. (Waltham.)

Babcock, Dr. Myron L.—Julesburg, Colo. (Waltham.)

Babcock, S. E.—Supt. and Purch. Agt. Babcock Electric Carriage Co., 226-42 W. Utica St., Buffalo, N. Y.

Babcock, Wm. Hy.—Sec. Acetylene Gas Illuminating Co., 105 Walker St., New York City.

Babcock, W. L.—Elk River, Minn. (Buick.)

Babcock Co., H. H.—Factory Square, Watertown, N. Y. Mfrs. automobile bodies. Cap. \$300,000. Est. 1845. G. H. Babcock, Pres. and Treas.; A. R. Flower, Vice-Pres.

Babcock Electric Carriage Co.—226-42 W. Utica St., Buffalo, N. Y. Makers of the Babcock electric vehicles. Cap. \$100,000. First automobile marketed

June, 1900; eight different models made since. F. A. Babcock, Pres. and Gen. Mgr. Frank L. Bapst, Vice-Pres., Harry Yates, Treas.; F. A. Babcock, Jr., Sec. and Mgr. of Sales; F. L. Peck, Designer; S. E. Babcock, Supt. and Purch. Agt.; J. J. Coakley, Advt. Mgr.; E. M. Osgood, Ass't. Supt.

Babcock Electric Carriage Co.—1591 Broadway, New York City. (Babcock.)

Babcock Hardware Co., A. L.—Billings, Mont. (Dragon.)

Babcock & Son.—Watertown, S. Dak. (Ford.)

Babcock Varnish Co.—Boston, Mass. Mfrs. varnishes.

Babert et Cie, Louis.—12 rue des Jacobins, Fontenay-le-Comte, Vendee, France. Mfrs. leather tires and non-skids.

Babson, R. D.—With Billings & Spencer Co., Russ and Lawrence, Sts., Hartford, Conn.

Bac et Henry.—10 rue Cavé, Levallois, Seine, France. Mfrs. coils.

Bachelor, C. A.—Angola, Ind. (Buick.)

Bachert, J. M.—Mgr. The Reliance Oil & Grease Co., 1501-21 Columbus Road, Cleveland, Ohio.

Bachten et Gallay.—Geneva, Switzerland. Mfrs. radiators.

Back Bay Automobile Co.—169-73 Huntington Ave., Boston, Mass. Garage.

Backe, T. A.—33 Herkimer Pl., Brooklyn, N. Y. Repairing.

Back-fire.—A term applied to a premature explosion that occurs in a gasoline motor, especially when starting, and which suddenly reverses the direction of the motor. The term is applied also to an explosion that takes place in the muffler from the ignition of an accumulation of unburned gas. See Barking.

Backing.—The resultant of gravity applied to a car on its way up or down hill. If the motor is too low powered, or if the brakes are not strong enough to resist the force gravity, the car will begin to back or start forward with a constantly accelerating speed, which if not checked, will result in a catastrophe. Backing may be prevented by a sprag, by good brakes, or by the motor itself, which, when the compression keeps up, and the ignition is cut out, will serve as a supplementary brake.

Back-kick.—See Back-fire.

Back-lash.—The amount of loose play between the two elements of a mechanism that have a tendency to move backward, as, for example, a gear-wheel and its pinion—the amount that the pinion can turn back without moving the wheel that drives it.

Back-on-the-gears.—An expression used to denote a change from the highest to a lower speed in bringing into action the change-speed gear.

Back Pressure.—A pressure contrary to the normal, such as that of the exhaust gases upon the piston of a gasoline motor during the exhaust-stroke, or that in the cylinder of a steam-engine due to the steam which is still escaping by the exhaust-port.

Backward Eccentric.—See Eccentric, Backward.

Bacon, Richard, Jr.—Mgr. Chicago branch Cleveland Motor Car Co., 1470 Michigan Ave., Chicago, Ill.

Badecker Gas Engine Co.—Omaha, Neb. Mfrs. gasoline automobile and marine motors.

Badger Brass Mfg. Co.—111th Ave., 36th to 37th St., New York City, and Kenosha, Wis. Mfrs. Solar motor car & boat headlights, sidelights, tail lights and gas, oil and electric generators. Member M. & A. M. Cap. \$50,000. Est. 1896. Geo. A. Yule, Pres.; L. J. Keck, Vice-Pres.; R. H. Welles, Treas.; Chas. M. Hall, Sales Mgr.; Warren French, Supt. Warehouse, San Francisco.

Badger Chemical Mfg. Co.—143 Reede St., Milwaukee, Wis. Mfrs. fire extinguishers, metal polishes, hand soap.

Badger Fire Extinguisher Co., The.—32 Portland St., Boston, Mass. Mfrs. fire extinguishers.

Badger Motor Co.—Milwaukee, Wis. Mfrs. gasoline marine motors.

Badger & Sons Co., E. B.—63-69 Pitts St., Boston, Mass. Mfrs. dashes and fenders, hoods, tanks.

Badiola, M.—Puerto de Santa Maria, Cadiz, Spain. Mfrs. primary batteries.

Baeder, Adamson & Co.—67 Beekman St., New York City. Mfrs. curled hair.

Baer, Herman Z.—Pres. Bryant Garage, 50-56 W. 43rd St., New York City.

Baer, Roy R.—310 1st Ave., Sterling Ill. (Cartercar.)

Baffle-plate.—A plate called also a deflector, fixed in the path of a moving fluid (liquid or gas) to check or alter the direction of its flow.

Bagley, Daniel.—2 Alberton St., Somerville, Mass. Garage.

Bagnall Auto Co.—4152 Olive St., St. Louis, Mo. (Cadillac.)

Bailey & Co., Inc., S. R.—Amesbury, Mass. Mfrs. electric automobiles.

Bailey, Bertram.—Vice-Pres. Bailey

Automobile Co., Birnie Ave., Springfield, Mass.

Bailey Co.—Cleveland, Ohio. (Oldsmobile.)

Bailey, Geo.—421 Clinton St., Milwaukee, Wis. (Lambert.)

Bailey, H. F.—Supt. Corbin Motor Vehicle Co., New Britain, Conn.

Bailey, L. E.—Supt. The Auto-Motor Car Co., 804-08 Sycamore St., Cincinnati, Ohio.

Bailey, Milton W., Sr.—Sec. and Treas. Standard Automobile Co., 110 5th Ave., Clinton, Iowa.

Bailey, C. J.—22 Boylston St., Boston, Mass. Patentee of the Bailey tread for automobile and motorcycle tires.

Bailey, S. E.—Pres. York Motor Car Co., 240 N. George St., York, Pa.

Baillie Basket Co.—82 Sudbury St., Boston, Mass. Mfrs. automobile baskets and hampers. Est. 1892. William Baillie, proprietor.

Baillie, William.—Proprietor Baillie Basket Co., 82 Sudbury St., Boston, Mass.

Bailly, C.—168 bdv. de la Villette, Paris, France. Mfrs. lubricators.

Bailly, Fred F.—Schroon Lake, N. Y. (Waltham.)

Baine, C. R.—1525 Seneca St., Buffalo, N. Y. Garage.

Bain, Walter & Manley, L.—Oakland, Cal. (Glide.)

Baird-Banks Mfg. & Supply Co., Inc.—203 Broadway, New York City. Mfrs. carbureters, generator valves, check valves, spark plugs. Est. Oct., 1906. M. E. Baird, Pres.; S. H. Congdon, Vice-Pres.; G. B. Banks, Sec. and Treas.

Baird, M. E.—Pres. Baird-Banks Mfg. & Supply Co., Inc.—203 Broadway, New York City.

Baird & Swan.—276-78 Main St., Norwich, Conn. Est. May, 1906. Agents Cadillac, Oldsmobile and Pope line. Garage, 75 cars. Repairing. Parts for cars represented carried, also accessories.

Baisley, F. H.—10 Crane St., Danbury, Conn. (Cameron.)

Baker Bros.—Westlake & Post Sts. & M. C. R. R., Toledo, Ohio. Mfrs. special automobile machinery.

Baker, C. R.—10 W. Main St., Salem, Ohio. (Ford, Queen, Marsh Motorcycle.)

Baker Electric Vehicle Company of Chicago, The.—Chicago, Ill. Cap. \$25,000. Incorporators: Julian L. Yale, Harry W. Corris and F. J. Colledge. (Baker.)

Baker, E. R.—Smethport, Pa. Garage.

Baker, F. A.—37 Warren St., New York City. (Indian.)

Baker, F. H.—Dowagiac, Mich. (Haynes.)

Baker, L. I.—Treas. Carlow Auto Co., 59 Weir St., Taunton, Mass.

Baker Mfg. Co., Jas. H.—503 Park Bldg., Pittsburg, Pa. Mfrs. drop forgings.

Baker Motor Vehicle Co.—Foot of 80th St., N. W., Cleveland, Ohio. Makers of the Baker electric car. First marketed in 1900; 15 models made since. R. C. White, Pres.; F. R. White, Vice-Pres. and Gen. Mgr.; M. L. Goss, Sec. and Sales Mgr.; R. C. Norton, Treas.; E. Gruenfeldt, Engineer and Designer; J. H. White, Supt.; C. H. Warren, Pur. Agt. New York office, Baker Motor Vehicle Co., 1790 Broadway, New York City.

Baker Motor Vehicle Co.—1790 Broadway, New York City. (Baker.)

Baker, W. A.—307 Salem St., Medford, Mass. Garage.

Baker, Walter Charles.—B. June 27, 1869, at Hinsdale, N. H. Educated at Case School of Applied Science. President and mechanical engineer American Ball-Bearing Co., Director American Ball-Bearing Co., Mathews Boat Co., Eastland Steamship Co., Lake Shore Navigation Co., Clifton Park, Sand & Improvement Co., Clifton Club, Cleveland Auto Club. Member Union Club, Clifton Club, Euclid Club, Cleveland Auto Club, Cleveland Chamber of Commerce, Society of Automobile Engineers, Electric and Civil Engineers Club, Lakewood Yacht Club. Residence, Clifton Park, Lakewood, Ohio. Office, American Ball-Bearing Co., 83rd St., N. W., Cleveland, Ohio. Owned first automobile 1897. Recreations, boating.

Baker, W. Harris.—Main St., Windsor, Vt. Garage.

Baker, Wm. V.—Pres. E. J. Willis Co., 8 Park Pl., New York City.

Baker & Co., F. A.—1080 Bedford Ave., Brooklyn, N. Y. (Indian.)

Baker & Co., Inc.—408-14 N. J. R. R. Ave., Newark, N. J. Mfrs. platinum, platinum sparking points.

Baker & Co., M. M.—Peoria, Ill. (Glide.)

Baker & Sons, Jos., Ltd.—Hyth road, Willesden Junction, London, England. Mfrs. transmission gears.

Bakersfield Garage.—19th & G St., Bakersfield, Cal. (Tourist.)

Bakker unt Zoon.—Ridderkerk, Holland. Mfrs. pneumatic tires.

Balance-gear.—See Gear, Balance.

Balancemobile Werke, C. E.—Buhler, Buttstadt im Thüringen, Germany. Mfrs. automobile motors.

Balancing.—A motor is balanced when it runs without tremor. The question of balancing is a very complex one, and can be exactly solved only by the use of special arrangements. It is a question here, of course, only of reciprocating motors, since rotary motors, such as turbines and dynamos, are naturally bal-

anced. The subject has been specially studied by Witz, in his Treatise on Gas Motors, from which it appears that the conditions necessary and sufficient for the balancing of a motor are: (1) That the resultant of the centrifugal forces due to the masses in rotation shall be null; (2) that the resultant of the forces of inertia of the parts in alternating motion shall be null; (3) that the reaction couple of the motor couple shall be balanced by an equal and contrary couple; (4) and, finally, such conditions must be fulfilled by any position whatever, and

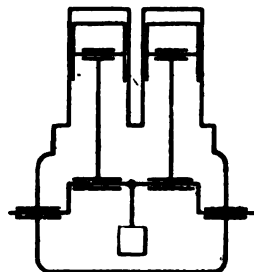


Fig. 1

the opposite forces that annul each other be in the same plane.

These conditions are fulfilled in the various types of ordinary motors in the following manner:

(a) In the single-cylinder motor, the first alone is fulfilled by balancing the mass of the crank and a fraction of that of the connecting-rod by a counterweight. The force of inertia is attenuated by the use of very light movable parts (connecting-rods and pistons), and the abrupt variations of the motor couple by the use of a powerful fly-wheel.

(b) In two-cylinder motors, two cases are to be considered according as the cranks are keyed at 0° (Fig. 1), or at 180° (Fig. 2). In the first case, we have, from the view-point of balancing, exactly the same conditions as in a single-cylinder. The variations of the motor couple,

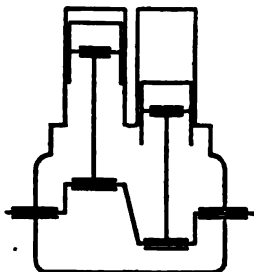


Fig. 2

however, are less prolonged for the reason that one "explosion" per revolution is obtained. It may be noted that the use of a counterweight in the fly-wheel seems to be rather faulty in that the stresses are not in the same plane (4th principle). The result is that the shaft tends to turn out of true and produces an abnormal

wear on the bearing, aside from the inevitable vibrations. The counterweights should always be placed at the crank. In the second case, the forces of inertia, as well as the centrifugal forces, are balanced, but in different planes. The result is oscillations of the motor in a longitudinal direction. Such oscillations, however, are less disagreeable on a car than transverse ones. Now, in the case of the motor considered, such oscillations attain a greater value than in the preceding by reason of the notable variations of the couple created by the dissymmetry of the strokes of the motor, which are, in fact, consecutive and followed by two passive strokes. On account of such disadvantages the motor keyed at 180° seems to be plainly inferior, from the view-point of regularity, if not from that of balancing, to the one at 0° .

The first arrangement is employed by Panhard, Decauville, etc., and the second by Brasier.

(c) The arrangement of the vertical 4-cylinder motor is plainly shown in Fig. 3. The efforts of inertia and centrifugal forces are balanced and in the same plane, since the pistons, which move in the same direction, are sym-

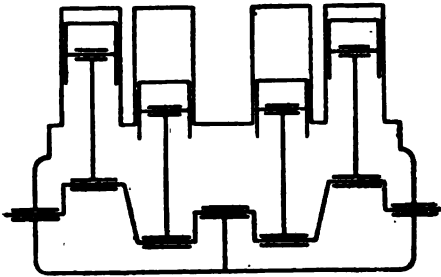


Fig. 3

metrically placed with respect to the center of the motor. The couples are not balanced. Their abrupt variation is attenuated by the use of a progressive regulation such as that generally employed on the admission, and by the use of a powerful fly-wheel. This remark also applies to the 1 and 2-cylinder motors already mentioned.

(d) The Bardon motor with horizontal cylinder and two opposed pistons (Fig.

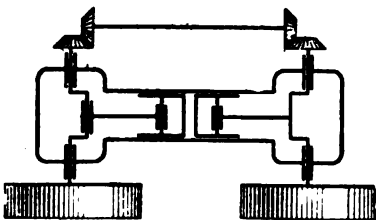


Fig. 4

4) was designed according to the plan indicated by M. Crozet with a view to complete balancing. The pistons mov-

ing on each side of a common explosion chamber are connected to crank-shafts turning in the opposite directions and operatively connected by the longitudinal driving-shaft. The centrifugal forces are balanced by the addition of counterweights to the cranks. The forces of inertia and the reactions are balanced naturally.

(e) The Gobron motor (Fig. 5), which

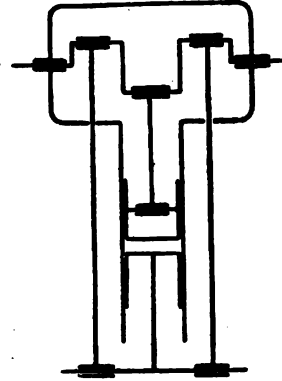


Fig. 5

likewise has opposed pistons, one of which is connected to the central crank by means of a short connecting-rod acting by compression, while the other is connected to the side-cranks by means of two long connecting-rods acting by traction, comprises but a single shaft, which does not permit of balancing the reactions. The same is the case with opposed pistons in a horizontal cylinder actuating, through connecting-rods, the central shaft placed below. Such arrangements are, however, not much employed.

As regards 3-cylinder motors, when these have cranks at 120° , the motor strokes succeed each other at equal intervals, the stresses of inertia and centrifugal stresses are approximately balanced, but in different planes, and this produces rocking. It is possible, however, to balance the centrifugal stresses in their plane by counterweights at the cranks. Examples of such motors are found in the Westinghouse (stationary motors), Louet and Panhard. But the reactions are not always balanced. Upon the whole, such a motor is slightly inferior to the 4-cylinder one. It costs less and may have but two bearings. When it is desired to balance all the efforts in the same plane, Caplet's arrangement, which in some respects resembles a Roser Mazurier compound motor with central expansion cylinder for the burned gases is adopted. As the end cranks are at 180° from the central one, it is possible, by judiciously increasing the weight of the latter and its piston, to balance the centrifugal efforts and those of inertia in the same plane,

just as in the 4-cylinder. From the viewpoint of reaction, the motor with cranks at 120° is inferior on account of the irregular distribution of the motor strokes, which succeed each other three by three with a passive stroke interposed. On this subject the same remarks might be made as on the 2-cylinder motors at 0° and 180° , and, all things considered, it is permissible to believe that cranks at 120° are preferable, especially if the motor is one having a stroke less than the bore, as is usually the case. It is, moreover, not very logical to increase the weight of a crank and piston at will. In the Roser Mazurier such a result is obtained by the fact that, as the central cylinder is an expansion one, it is of wide diameter. Finally, the strokes succeed each other therein as in the 4-cylinder motors, the central piston alternately receiving the heating of the end ones.

Balata.—An elastic gum obtained from *Mimusops balata* (order Sapotaceae), a large tree, native of Venezuela, the Guianas and the West India Islands. The tree is particularly abundant in the Guianas, where the preparation of balata gum has, within the last five or six years, become an important industry. Balata is, in character, between rubber and gutta percha, having the elasticity of the one and the ductility of the other without the intractability of rubber or the brittleness of gutta percha. It is largely used as an insulating medium.

Balcom, C. T.—Sec. and Treas. Archer & Co., 1597 Broadway, New York City.

Baldauf, C. G.—Limbacherstrasse 37, Chemnitz, Germany. Mfrs. springs.

Baldner Motor Vehicle Co.—Church & Whitney St., Xenia, Ohio. Repairing.

Baldwin Bros. Co.—Rochester, Pa. (Pope-Hartford.)

Baldwin Chain & Mfg. Co.—199 Chandler St., Worcester, Mass. Mfrs. chains, sprockets. Member M. & A. M. Cap. \$100,000. Est. 1896. W. F. Brawn. Pres.; W. H. Gates. Treas.

Baldwin, L. F. N.—Providence, R. I. (Stanley.)

Baldwin Motor Works.—Merrick Rd., Freeport, L. I., N. Y. Supplies; garage.

Baldwin, William Earle.—B. Dec. 13, 1872, at Belchertown, Mass. Education, private and high schools. Sec. and Advt. Mgr. Automobile Topics, Times Bldg., New York City. Started first automobile newspaper department in New York Mail and Express.

Bales, Frank.—Kansas City, Mo. (Cadillac.)

Balfour, Robt. A.—Pres. Northwestern Motor Car Co., 1928-30 N. 20th St., Philadelphia, Pa.

Balkwill Pattern Works.—970 Hamilton St., Cleveland, Ohio. Pattern makers.

Ball, Chas. A.—58-62 Palmetto St., Brooklyn, N. Y. Repairing.

Ball, H. F.—Vice-Pres. American Locomotive Automobile Co., Providence, R. I.

Ball, H. H.—93 Broadway, Paterson, N. J. (Orient Buckboard.)

Ball, Jno. R.—Sec. and Treas., Purch. Agt., Sales and Advt. Mgr. Merkel Motor Co., 1090 26th Ave., Milwaukee, Wis.

Ball, J. V.—Loyalton, Cal. (Waltham.)

Ball, Leroy D.—Sec. Empire State Motor Car Co., 2148 Broadway, New York City.

Ballanger, W. S.—Treas. Buick Motor Co., Flint, Mich.

Ballast.—A term applied to the covering of roads generally; called also "metalling." (2) Any heavy substance placed in the hold of a boat or the car of a balloon in order to steady it.

Balnew, C. H.—Gen. Mgr. Miami Cycle & Mfg. Co., Grand Ave., Middletown, Ohio.

Ball-joint.—See Joint, Ball.

Balloon, Dirigible.—A balloon, usually spindle-shaped and fitted with some kind of propelling mechanism (actuated by steam, electricity or other form of energy) by which its movement is controlled and the balloon navigated and made to move to a certain extent independently of the direction and velocity of the wind. The dirigible balloon is now so far perfected as to constitute an important part of the equipment of every large army organization.

Ballooning and Aeronautics.—45 Graf-ton St., Tottenham Court Road, London, W. England. (Aeronautical Magazine.)

Balloon-records.—World's record for distance, 1293.5 miles, established by Count Henri de La Vaulx, aeronaut, commanding the "Centaur" (57,218 cubic feet) inflated with three-quarters hydrogen. Assistant, Count de Castillon de Saint-Victor. Started Oct. 9, 1900, at 2h. 5m. from Vincennes and landed at Karostychew, Russia, Oct. 11, at 10h. 5m., breaking the record made by Prof. John Wise on July 1, 1859, who covered a distance, measured by modern methods, of 870 miles from St. Louis to Henderson, N. Y.

World's record for duration, 44h. 2m., established by M. A. Le Blanc, aeronaut, commanding "L'Isle de France," inflated with illuminating gas. Assistant, E. W. Mix. Started Oct. 21, 1907, from St. Louis, Mo., and landed Oct. 23 at Herbertsville, N. J.

French record for altitude, 28,044 feet, established by M. Jacques Balsan, aeronaut, commanding the "Saint-Louis" (105,960 cubic feet) inflated with illuminating gas. Assistant, M. Louis Godard. Started from Vincennes Sept. 23, 1900,

at 13h. 50m. Landed at Passy-Enigny on the same day at 17h. 15m.

World's record for altitude, 33,784 feet, established by Dr. Berson, aeronaut, commanding a balloon of 284,560 cubic feet, inflated with three-quarters hydrogen. Assistant, M. Suring. Started from the aerostatic park of Berlin July 31. Landed at Cottbus, Germany.

Balloon-valve.—See Valve, Balloon.

Ballot et Cie.—105 bvd. Brune, Paris, France. Mfrs. auto and marine motors.

Ballou, J. P.—175 Washington St., North Attleboro, Mass. Garage; repairing and supplies.

Ballou & Wright.—86 Sixth St., Portland, Ore. (Indian.)

Ball-race.—In ball-bearings, the circular groove in which the balls travel.

Ball Tool Co.—253 A St., Boston, Mass. Mfrs. wrenches.

Ball-valve.—See Valve, Ball.

Balmer, U.—Moutier, Jura-Bernois, Switzerland. Mfrs. motorcycles.

Baltimore Ave. Garage.—49th and Baltimore Ave., Philadelphia, Pa. Garage.

Baltimore Buggy Top Co.—Baltimore, Md. Mfrs. automobile tops.

Baltimore County Motor Club.—Allen Schwartz, Sec., Baltimore, Md.

Baltimore Enamel & Novelty Co.—Foot of Allen St., Baltimore, Md. Mfrs. license numbers, name plates.

Baltimore Motor Carriage Co.—305 N. Howard St., Baltimore, Md. (Winton.)

Baltzinger, F.—Montbéliard, Doubs, France. Mfr. circulating pumps.

Balzer, Gus.—1556 Broadway, New York City. Mfr. radiator monograms, crests and signs, lamp and auto numbering devices. Mfrs. agent for shock absorbers, speedometers, grease guns, generators, oilers.

Band.—Any thin strap of metal or other material fixed around the circumference of an object.

Band-brake.—See Brake, Band.

Banfil, W. H.—78 Portland St., Boston, Mass. (Jewell.)

Bangor Auto Garage & Motor Co.—2nd and Market Sts., Bangor, Pa. (Rambler.)

Bangor Automobile Club.—A. Fred Seem, Sec., 104 Market St., Bangor, Pa.

Banker, Arthur L.—Pres. Banker Bros. Co., Baum & Beatty Sts., Pittsburg, Pa.

Banker Bros. Co.—Baum and Beatty Sts., Pittsburg, Pa. Dealers and Mfrs. of wind shields, capetops, limousine bodies. Agents; Pierce-Arrow, Stevens-Duryea, Cadillac, Autocar. Cap. \$100,000. Inc. Nov. 20, 1901. Arthur L. Banker, Pres.; M. Ray Stehley, Sec.; E. C. Hans, Supt.; C. O. DuMars, Purch. Agt.; R. P. McCurdy, Sales Mgr.

Banker Co., A. C.—36th St. and Grand Blvd., Chicago, Ill. (Logan, Compound.)

Banks, G. B.—Sec. and Treas. Baird-

Banks Mfg. & Supply Co., Inc., 203 Broadway, New York City.

Banner, Frank.—Foreman of factory, The Breeze Carbureter Co., 276 Halsey St., Newark, N. J.

Bannister, Walter C.—Mgr. Standard Auto Renting Co., 186 E. 73rd St., New York City.

Banta, A. J.—1354 Michigan Ave., Chicago, Ill. (Locomobile.)

Bantam Anti-Friction Co.—Bantam, Conn. Mfrs. ball bearings. Garage.

Bapst, Frank L.—Vice-Pres. Babcock Electric Carriage Co., 226-242 W. Utica St., Buffalo, N. Y.

Bar.—A rod of metal of various forms of cross-section. A term applied also to certain mechanisms and parts of structures.

Bara, Pascault et Riga.—35 rue Victor-Massé, Paris, France. Mfrs. primary batteries, motorcycles, speed indicators.

Barad.—The C. G. S. unit of pressure; the pressure of one dyne per square centimetre.

Barber, A. G.—Pres. and Treas. Globe Optical Co., 403 Washington St., Boston, Mass.

Barber Bros.—101 Grape St., Syracuse, N. Y. Mfrs. gasoline automobile motors.

Barber, F. A.—Vice-Pres. Globe Optical Co., 403 Washington St., Boston, Mass.

Barber Mfg. Co.—Anderson, Ind. Mfrs. seat springs.

Barbier et Brandon.—112 rue d'Antony, St.-Etienne, France. Mfrs. radiators.

Barbou fils.—52 rue Montmartre, Paris, France. Mfrs. jacks.

Barbour, Plumb & Co.—2119 Third Ave., Birmingham, Ala. (Mitchell.)

Barbour, W. F.—Pres. Northern Motor Car Co., Champlain and Canton Sts., Detroit, Mich.

Barclay Auto Co.—246 Third Ave., Minneapolis, Minn. (Autocar, Stanley.)

Barclay, Jas.—Pres. Warner Instrument Co., 2022 Roosevelt Ave., Beloit, Wis.

Barco, Geo. C.—Olive St., West Palm Beach, Fla. Agent Rambler. Renting; repairing. Garage, 6 cars.

Barcus & Co., Geo.—Wabash, Ind. Mfrs. gray iron castings.

Barden, E. A.—Mgr. Barden Electric & Mchy. Co., 109 Main St., Houston, Tex.

Barden Electric & Machinery Co.—109 Main St., Houston, Tex. Agents Rambler, Reo, Mitchell, Frayer-Miller. Est. 1900. E. A. Barden Mgr.

Barden, Clérc et Cie.—12 bvd. Sebastopol, Paris, France. Mfrs. non-skid bands.

Barff Process.—A process of protecting iron from rust by heating to redness and exposing it to steam, thus producing a coat of the so-called magnetic oxide of iron, Fe₃O₄.

Bargain Auto Co.—1628 Broadway, New York City. Garage.

Barge & Co., Wm.—Bloomfield, Neb. (Holsman.)

Barger, W. H.—32 Edwards St., Buffalo, N. Y. (Waltham.)

Barger, W. H.—226 S. Lafayette St., South Bend, Ind. (Cadillac, Waltham.)

Barkdoll, A. R.—810 Great Northern Bldg., Chicago, Ill. (Simplicity.)

Barker, E. L.—Tiverton, R. I. (Maxwell.)

Barker Engine Co.—South Norwalk, Conn. Mfrs. gasoline marine motors.

Barker & Hitch.—Girard, Kan. (Northern.)

Barking.—A term applied to a series of violent explosions in the muffler due to after-firing. See After-Firing.

Barkman, A. B.—Sales Mgr. Maxwell-Briscoe Co., Tarrytown, N. Y.

Barkworth, Thos. E.—Vice-Pres. National Wheel Co., Jackson, Mich.

Barlow Foundry Co., The.—28 Orange St., Newark, N. J. Mfrs. gray iron and malleable iron castings.

Barlow Hardware Co.—Corry, Pa. (Winton.)

Barlow Mfg. Co.—Holyoke, Mass. Mfrs. robe rails, metal trimmings.

Barnard, J. A.—Treas. Moline Pump Co., Moline, Ill.

Barnard, Wm. H.—Pres. and Treas. De Barres Automobile Co., 1968 Broadway, New York City.

Barndt, Chas. F.—Sec. and Gen. Mgr. The Barndt-Johnston Auto Supply Co., 426 Donaldson St., Columbus, Ohio.

Barndt-Johnston Auto Supply Company, The.—426 Donaldson St., Columbus, Ohio. Mfrs. automobile bodies, tops, wind shields. Cap. \$25,000. Est. Sept. 25, 1905. C. Christian Born, Pres.; W. R. Johnston, Vice-Pres. and Gen. Supt.; Louis P. Hoster, Treas.; Chas. F. Barndt, Sec. and Gen. Mgr.; Wm. Bauer, Director.

Barnes Bros.—Blue Earth, Minn. (Buick.)

Barnes, Clair L.—Sec. and Gen. Sales Mgr. Detroit Steel Products Co., 91 E. Fort St., Detroit, Mich.

Barnes Co., W. F. & John.—Rockford, Ill. Mfrs. special automobile machinery.

Barnes, E. K.—Rockford, Ill. (Pope-Waverley.)

Barnes, F. J.—Asst. Treas. N. Y. & N. J. Lubricant Co., 14-16 Church St., New York City.

Barnes Gear Co.—Oswego, N. Y. Mfrs. steering apparatus.

Barnes, Hector.—Fargo, N. Dak. (Buick.)

Barnes, Jas.—Sec. C. T. Ham Mfg. Co., 731 Oak St., Rochester, N. Y.

Barnes, John C.—Branford, Conn. Garage.

Barnes Mfg. Co.—Sandusky, Ohio. Mfrs. automobiles, gasoline.

Barnett Drop Forging Co.—East Hampton, Mass. Mfrs. drop forgings.

Barnett, Frank B.—Advt. Dept. The Automobile, Flatiron Bldg., New York City.

Barnett, Ira S.—Sec. and head repairs and sundries depts., Kentucky Automobile Co., 1051 3rd Ave., Louisville, Ky.

Barnett, Jackson Co.—236 W. 54th St., New York City. (Dorris.)

Barnett & Levy.—1049 3rd St., Louisville, Ky. (Haynes.)

Barnewall, A. V. R.—Second Vice-Pres. Dow Tire Co., 104 W. 42d St., New York City.

Barnickol, Ferd.—Vice-Pres. Indianapolis Drop Forging Co., Indianapolis, Ind.

Barnicle, Robt.—528 N. Vandeventer Ave., St. Louis, Mo. (Waltham.)

Barnstable Motor Car Co.—West Barnstable, Mass. (Atlas.)

Barograph.—An instrument for continuously recording the atmospheric pressure, used by aeronauts; a self-recording barometer.

Barometer.—See Aneroid.

Barr, Geo. F.—Sec. Aerocar Motor Company, Mack & Beaufait Ave., Detroit, Mich.

Barré et Cie, C.—avenue de la République, Niort, Deux-Sevres, France. Mfrs. automobiles, gas.

Barrel.—The cylindrical part of many structures, as the body of a pump, drum, etc.

Barrelled Road.—The same as "cambered road," a road with a convex surface.

Barrett, E. H.—Medina, N. Y. Garage.

Barrett Mfg. Co., James.—Boston, Mass. Mfrs. brass pipe fittings.

Barrett, Samuel.—Foreman J. E. Longergan & Co., 211-15 Race St., Philadelphia, Pa.

Barrett's Son, A.—Camden, Me. Mfrs. motor boats.

Barrett, W. G.—Katonah, N. Y. (Maxwell.)

Barringer Co., Ormond L.—Office, 20 W. Trade St., Garage, 10 N. Church St., Charlotte, N. C. Agts. Franklin, Autocar, Cadillac, Baker, Pope-Waverley, White. Est. July 1, 1904. Cap. \$10,000. Garage (40 cars); repairing.

Barriquand et Marré, Société Anonyme des Ateliers.—127 rue Oberkampf, Paris, France. Mfrs. automobiles, gas, and automobile motors. (B. & M. cars.)

Barron & Co., A. H.—Gardner, Mass. (Northern.)

Barrows, W. H.—Chief Engineer North Penn Iron Co., 3rd & Venango Sts., Philadelphia, Pa.

Barry Co., J. M.—343 Tremont St., Boston, Mass. Dealers in second-hand automobiles. Est. 1889. Garage (30 cars); repairing.

Barthelat, P.—7 rue de Cormeille, Levallois, Seine, France. Mfrs. non-skids, leather tires.

Barth Mfg. Co.—Milwaukee, Wis. Mfrs. jacks.

Bartholomew Co., The.—300-500 Glide St., Peoria, Ill. Makers of the Glide car, first marketed 1902. Seven models made since. Cap. \$200,000. J. B. Bartholomew, Pres. and Designer; G. G. Luthy, Sec. and Purch. Agt.; O. Y. Bartholomew, Vice-Pres., Treas. and Advt. Mgr.; J. M. Kupel, Supt.; R. A. Whitney, Sales Mgr. Crown Motor Car Co., 23 Motor Mart. Park Square, Boston, Mass.; C. F. Dye, Remington, Ind.; Glide Motor Car Co., 327 Baronne St., New Orleans, La.; Howard Automobile Co., Des Moines, Ia.; Montana Garage Co., Butte, Mont.; Geo. J. Scott Motor Co., 1720 Broadway, New York City; L. P. Dorsett Co., 17th and U Sts., N. W., Washington, D. C.; R. L. Sutherland, 115 W. Maryland St., Indianapolis, Ind.; M. M. Baker & Co., Peoria, Ill.; Fawkes Auto Co., 111 6th St., Minneapolis, Minn.; Martland Automobile Co., 152 12th St., San Francisco, Cal.; Allegheny Automobile Co., 915 Irwin Ave., Allegheny, Pa.; Poirier, Bes-sette & Co., Montreal, Canada.

Bartholomew, J. B.—Pres. and Designer The Bartholomew Co., Peoria, Ill.

Bartholomew, O. Y.—Vice-Pres., Treas. and Advt. Mgr. The Bartholomew Co., Peoria, Ill.

Bartlett, A. E.—Pres. Rockford-Kalamazoo Fire Extinguisher Co., 277 W. State St., Rockford, Ill.

Bartlett, E. E.—Vice-Pres. Rockford-Kalamazoo Fire Extinguisher Co., 227 W. State St., Rockford, Ill.

Bartlett, E. S.—Pres. Trebert Gas Engine Co., 35 & 37 Ford St., Rochester, N. Y.

Bartlett, Geo. A.—Willimantic, Conn. (Columbia.)

Bartlett, W. D.—Supt. Cleveland Cap Screw Co., 2216 Clarkwood Road, Cleveland, Ohio.

Bartlett & Frasier.—106 N. Jefferson St., Huntington, Ind. (Buick.)

Barton, F. A.—Sec. H. H. Franklin Manufacturing Co., 302 S. Geddes St., Syracuse, N. Y.

Barton & Day.—South Union St., Cambridge, N. Y. (Cameron.)

Bartoo, Geo. E.—409 First Ave., Spokane, Wash. (Monarch, Reo.)

Barto, R. V.—Vice-Pres. and Gen. Mgr. Direct Drive Axle Co., 575 N. 4th St., Columbus, Ohio.

Barwise, R. M.—179th St., and Jerome Ave. (Chalfant.) Est. Oct., 1906. Garage (24 cars); repairing.

Base, Wheel.—The distance from the center of a front wheel of a vehicle to the center of a rear wheel on the same side.

Basic Process.—An improvement on the Bessemer steel process in which the converter is lined with magnesian limestone, a material nearly free from silica. This removes the phosphorus and silica, which are very detrimental to the iron, even in small quantities. See Acid Process.

Basset et Méline.—25 rue de Courcelles, Levallois-Perret, Seine, France. Mfrs. automobiles, gas. (Ibis cars.)

Bassette, Buell B.—Sec. and Treas. Corbin Motor Vehicle Co., New Britain, Conn.

Bassett, I. B.—Pres. Bassett-Pressley Co., Western Reserve Bldg., Cleveland, Ohio.

Bassett-Pressley Co.—Western Reserve Bldg., Cleveland, Ohio. Mfrs. special sheets for automobile bodies, hoods, fenders and tanks, iron and steel bars and sheets. Cap. \$200,000. Est. 1885. I. B. Bassett, Pres.; F. W. Sack, Vice-Pres.; F. H. Deitz, Sec. and Treas.; F. W. Beach, Sales Mgr.

Bassford, B. E.—Tonopah, Nev. (Maxwell.)

Bass, Theo.—Farmington, Ill. (Reo, Premier.)

Bastian Mfg. Co., Chas. L.—76 Illinois St., Chicago, Ill. Mfrs. brass, bronze, aluminum and copper castings.

Batavia Machine Co., The.—24 Main St., Batavia, N. Y. Automobile supplies; repairing.

Batavia Rubber Tire Co.—Batavia, N. Y. Mfrs. tires (solid rubber).

Batchelder, Amos G.—B. Sept. 8, 1869, at Akron, N. Y. Educated at Attica (N. Y.) Union School and Academy. Present occupation, Managing Editor The Automobile, New York City. Formerly automobile editor New York American, 1901-02; Evening Mail, 1903; editor Motor, 1903-05; Sec. American Automobile Association, 1905-06. Member of Executive Committee of the A. A. A. Board of Directors; also member of Racing Board and Vanderbilt Cup Commission; Vice-Pres. New York Motor Club; member of Automobile Club of America.

Batchelor, J. P.—Pres. Palace Auto Co., 1408-10 Walnut St., Kansas City, Mo.

Bate, J. W.—Gen. Supt. and Designer Mitchell Motor Car Co., Racine, Wis.

Bates Forge Co.—227 W. Merrill St., Indianapolis, Ind. Mfrs. crank shafts, drop forgings, axles.

Bates, Geo. A.—Englewood, N. J. (Cadillac.)

Bates-Odenbrett Auto Co.—503 Broadway, Milwaukee, Wis. (Buick, Winton.)

Bates-Tannahill Co.—Greenville, S. C. (Buick, Cadillac, Franklin, Oldsmobile.)

Bath, Albert.—Purch. Agt. Aerocar Motor Co., Mack & Beaufait Ave., Detroit, Mich.

Bath Automobile & Gas Engine Co.—Broad and Commercial Sts., Bath, Me. (Winton, Franklin, Cadillac.) Supplies, garage, repairs.

Bath Marine Construction Co.—Bath, Me. Mfrs. motor-boats.

Bat Motor Mfg. Co.—Peuge, London, S. E., England. Mfrs. Bat motorcycles.

Battery Garage.—Richmond, Va. Garage.

Battery.—A number of primary or secondary cells acting together; a term often incorrectly applied to a single cell. See Cell.

Battery Dry.—See Cell, Primary.

Battery, F. E.—357 Fountain St., Providence, R. I. Garage.

Battery Power Co.—247-253 Madison St., Milwaukee, Wis. Mfrs. storage batteries.

Battery, Storage.—See Cell, Storage.

Battery-syringe.—A rubber syringe used for withdrawing a portion of the electrolyte from a storage battery cell for the purpose of testing its specific gravity and density.

Battery-tester.—The same as ammeter, q. v.

Battery, Underswung.—In an electric vehicle, a battery carried in a frame suspended from the center of the main frame.

Battery, Wet.—See Cell, Primary.

Baudier, Ch.—30 rue Baudin, Levallois, Seine. France. Mfrs. pressed steel frames, radiators.

Baudry de Saunier (Charles Louis Baudry).—Born in Paris, France, March 2, 1865; the grandson of General de Saunier, 20 Rue Duret, Paris. Editor-in-chief of "Omnia." Author of *L'Histoire Générale de la Vélocipédie* (1891); *Le Cyclisme théorique et pratique* (1892); *Les Recettes et Procédés vélocipédiques* (1893); *L'Art de la Bicycleette* (1894); *Le Debutant* (philosophical work, 1895); *L'Automobile théorique et pratique* (Tome 1, 1897. Tome 2, 1900); *Les Recettes du Chauffeur* (1901); *Sa Majesté l'Alcool* (1904); *Les Motocyclettes* (1904); *L'Allumage dans les Moteurs a explosions* (1905).

Bauer, A.—14 rue de Hollande, Geneva, Switzerland. Mfrs. pneumatic tires.

Bauer Bros.—937 W. 8th St., Cincinnati, Ohio. Mfrs. auto tops.

Bauer, Geo. J.—112 Exchange St., Rochester, N. Y. (Aerocar.)

Bauer, William.—Director The Barndt-Johnston Auto Supply Co., 426 Donaldson St., Columbus, Ohio.

Baughner, J. L.—Central Ave., Staunton, Va. (Rambler.) Est. Sept, 1905. Garage (150 cars); repairing.

Baumgartner, W. E.—Stockholder Lawrence Motor Car Co., 13-17 W. Warren St., Lawrence, Kan.

Baum's Castorine Co.—104 N. George St., Rome, N. Y. Branch at Boston, Mass. Mfrs. engine oil, varnish, hand soap, cup and transmission grease, radiator compound. Cap. \$15,000. Est. 1881. T. J. Mowry, Pres.; T. C. Mowry, Sec. and Treas.; J. M. Bearisto, P. F. Nichols. Geo. B. Nason, Salesmen.

Bausch & Lomb Optical Co.—Rochester, N. Y. Mfrs. lamp reflectors and optical goods.

Bausch Machine Tool Co.—Wason Ave., Springfield, Mass. Mfrs. universal joints.

Bauxite.—An impure hydrate of aluminum ($Al_2O_3 \cdot 2H_2O$), with impurities of oxide of iron, phosphates, etc. It occurs in oolitic or clay-like deposits of whitish-brown or reddish-brown color, at Beaux in France and Foyers in Scotland, etc. It is now the principal workable ore of aluminum, and is known as "aluminum ore." When heated, it becomes extremely hard and is used as artificial emery.

Bawden, John H., Jr.—Freehold, N. J. (Rambler.)

Baxter, T. S.—317 Hastings St., Vancouver, B. C., Canada. (Haynes.)

Bayard, Ch.—80 rue Voie-de-Liege, Herstal, Belgium. Mfrs. Bayard motorcycles.

Bayard-Clément.—33 quai Michelet, Levallois-Perret, Seine, France. Mfrs. automobiles, gasolene.

Bay City Auto Co.—1016 Saginaw St., Bay City, Mich. (Cadillac.)

Bayless, Geo. C.—Treas. Tray Plate Battery Co., 5 Frederick St., Binghamton, N. Y.

Bayliss, Jas. E.—General Sales Agent. 1218 Michigan Ave., Chicago, Ill. (Elmore.)

Bayonet Clutch.—See Clutch, Bayonet.

Bay Ridge Launch Works.—Foot 39th St., Brooklyn, N. Y. Mfrs. motor boats.

Bay State Auto Co.—112 Norway St., Boston, Mass. Makers of the Bay State Forty car, first marketed 1907, one model. Cap. \$50,000. F. R. Bolz, Treas.; Julius Bolz, Pres.; Rossel Drisko, Purch. Agt., Sales, Advt. and Gen. Mgr.; Geo. E. Temple, Designer. Boston agts. Queen car.

Bay State Automobile Ass'n.—282 Dartmouth St., Boston, Mass. J. Fortescue, Sec.

Bay State Machine Co.—1302-06 Peach St., Erie, Pa. Mfrs. marine motors.

Bay State Stamping Co.—380 Chandler St., Worcester, Mass. Mfrs. oil cups, oil hole covers, sheet metal stampings. Not incorporated. Est. 1892. John H. Bennett, Prop. and Gen. Mgr., doing business under above name. Henry Larava, mechanic; John Stapleton, foreman press room.

Bazille Auto Co.—15 E. 9th St., St.

Paul, Minn. (Autocar, Stevens-Duryea, Buick, Baker.)

Beacham & Son, R. H.—Fleet St., Portsmouth, N. H. Est. 1904. Harry M. Tucker, Supt. Garage, 100 cars; repairing.

Beach, E.—Pres. and Director Neer Air Cooled Engine Co., Plain City, Ohio.

Beach, F. W.—Sales Mgr. auto products Bassett-Pressley Co., Western Reserve Bldg., Cleveland, Ohio.

Beach, J. A.—William and Market Sts., Elmira, N. Y. (Cadillac.)

Beach, J. C.—Sabinsville, Pa. (Buick.)

Beach, S. C.—Sales Mgr. McCook Auto Co., 308 W. Dennison St., McCook, Neb.

Bead.—That part of a pneumatic tire which enters and remains hooked into the rim and is held in place by the pressure of the air in the inner tube or by mechanical means.

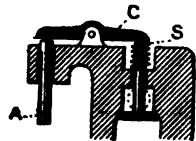
Beak-iron.—The conical projection of an anvil. Called also a "bickern."

Beale, S. T.—Paw Paw, Ill. (Maxwell.)

Beals, Geo. C.—29 Erie County Bank Bldg., Buffalo, N. Y. Mfrs. iron and steel sheets and bars.

Beam.—One of several transverse pieces of timber stretching across a boat from one side to the other to support the deck and retain the sides at a proper distance.

Beam, Walking.—A part of the valve-control mechanism, called also a "rocker arm," placed on top of the cylinder and transferring the upward motion of the push-rod A (see figure), into a downward motion of the valve-stem S. A corruption of "working-beam."



Beaman & Smith Co., The.—Providence, R. I. Mfrs. special automobile machinery.

Beaman, E. A.—Pres. Tray Plate Battery Co., 5 Frederick St., Binghamton, N. Y.

Beamsderfer, A. B.—Lebanon, Pa. (Pope-Toledo.)

Bean, Sidney A.—1780-82 Broadway, New York City. Supplies.

Beardsley, Chas. S.—Vice-Pres. Hatcher Auto Parts Co., 2108 Superior Ave. Viaduct, Cleveland, Ohio.

Beardsley & Son.—Woodstock, Ill. Garage.

Bearing.—The support in which a shaft or other part of a machine revolves or pivots. The forms are chiefly distinguished from each other by the means used to diminish friction.

Bearing, Ball.—A bearing in which the shaft rests upon hard steel balls, which, rolling easily in their "races," re-

duce friction to a minimum. The balls should be of the best quality and perfectly accurate. The material for the housings ("shells," "sleeves," "cups," "races," "rings," or "cones," as they may be called), must be determined by the conditions. A steel that may be suitable in one condition may be totally unfit for duty in other conditions.

As there are but two original purposes of bearings, there are consequently but two original types. One of these serves



Fig. 1. Fig. 2.

for carrying the load directly upon, and at right angles to, the shaft or axle, and is termed a "radial" bearing (Fig. 1). The other type takes the load of the shaft or axle endwise, or parallel to it, and is termed a "thrust" bearing (Fig. 2).

The radial bearing consists of an inner race and outer race, with sometimes a series of separators. The balls roll in grooved tracks of circular cross-section, having a slightly larger curvature than the balls, so that these come in contact with the races only at the bottom of the grooves. The contact, therefore, is of the two-point order, as the ball-races are each a single complete ring without joint or opening of any kind. The balls serve to lock the whole together as a complete unit.

The thrust-bearing is made similar to the radial type, but is mounted to take the load parallel to the axis of the shaft, thrust-collars also being used to take the loads parallel to the axis of the shaft.

Two-point bearings are now made in sizes of balls running from $\frac{1}{4}$ to $1\frac{1}{2}$ inches in diameter and containing from 6 to 21 balls in each case. These modern ball-bearings are remarkable for the very small space they take up endwise, including the oil-retaining and dust-excluding arrangements, thus varying between $\frac{3}{4}$ and $1\frac{1}{2}$ times the shaft-diameter. The larger the shaft, of course, the less is the relative bearing space.

Ball bearings may be either "full" or "silent." The race of the full type

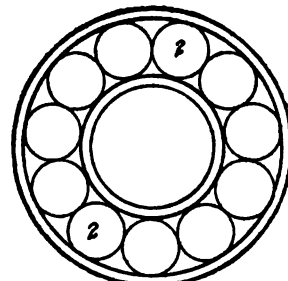


Fig. 3

(Fig. 3) is completely filled with balls,

while that of the silent type (Fig. 4)

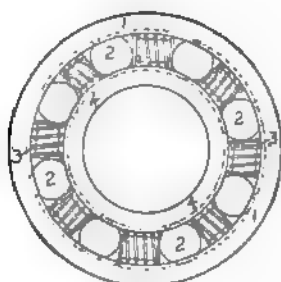


Fig. 4

contains about half as many, either retained in a cage or held apart by spring separators, (3) containing felt, which absorbs oil and delivers it as the balls revolve.

The following table gives the allowable working load for steel balls of different diameters. It must be considered in this connection that the working load is carried by one ball at a time:

Diameter of ball	1-4	5-16	3-8	7-16	9-16	5-8
Working load per ball in pounds	500	780	1125	1530	2530	3125

Bearing, Collar.—A bearing fitted between two collars or rings, formed integral with or attached to a shaft, and permitting of rotary but not lateral motion.

Bearing, Cone.—A plain bearing in which a solid cone on the shaft-end revolves in a hollow cone of hard steel or brass.

Bearing, Plain.—A bearing in which smooth metal surfaces slide against each other, usually with a film of lubricant between them.

Bearing, Roller.—A bearing consisting of a series of hard steel rollers, each held in place by a pin, which is attached to plates forming a cage. Roller bearings are either cylindrical or taper, and



one well known form consists of a strip of metal rolled into a spiral. Taper or conical rollers are especially adapted for carrying both a radial and thrust-load at the same time. Roller bearings are largely used in automobile construction, wherein they have given excellent results both for rear axles and transmissions.

Bearing, Step.—A box or casing, C (see figure), called also a "step-box" or "foot-step-box," to enclose the pivot, P, of an upright shaft, and provided at the bottom with a cast-iron,



case-hardened iron or cup-shaped brass "step" or bearing G

Beau et Cie, C.—171 rue Lafayette, Lyon, France. Mfrs. tires, non-skid bands.

Beaufort Motor Co.—14 Baker St., London, England. Mfrs. automobiles, gas; automobiles, commercial, gas.

Beaujon.—9 rue de Chaillot, Paris, France. Mfrs. non-skid bands.

Beaulieu u Krone.—9 Schönebergerstrasse, Berlin, Germany. Mfrs. automobiles, gas. (Solidor cars.)

Beauman, Frank.—Lampassas, Tex. (Jewell.)

Beaver Dam Malleable Iron Co.—Beaver Dam, Wis. Mfrs. malleable iron castings.

Beaver Mfg. Co.—Barclay and Oregon Sts., Milwaukee, Wis. Mfrs. motors, automobile.

Beaver Valley Motor Club.—Paul H. Baldwin, Sec., Rochester, Pa.

Bechtel, H. H.—2nd Vice-Pres. and Sec. American Oak Leather Co., Kenner St. & Dalton Ave., Cincinnati, Ohio.

Bechtel, O. G.—Mgr. New York Branch Waltham Mfg. Co., 1615 Broadway, New York City.

Becker & Kurts.—456 State St., Rochester, N. Y. Garage.

Becker, August.—247 Atlantic Ave., Boston, Mass. Mfrs. name plates.

Becker, B. A.—Treas. Elmore Mfg. Co., Clyde, Ohio.

Becker-Brainard Milling Machine Co.—110 Business St., Hyde Park, Mass. Mfrs. milling machines, milling cutters, automatic gear cutters. Cap. \$750,000. E. N. Foss, Pres.; A. H. Lovejoy, Treas. and Gen. Mgr.

Becker, F. W.—Auto Dept. N. D. Griffin, 99 W. Fulton St., Gloversville, N. Y.

Becker Glass & Paint Co.—372 to 378 Pearl St., Buffalo, N. Y. Mfrs. paints.

Becker, H. V.—Pres. Elmore Mfg. Co., Clyde, Ohio.

Becker, James Howard.—Manufacturer Elmore automobiles. B. Red Creek, Wayne Co., N. Y., Dec. 4, 1864. Ed. high school. Sec. and Mgr. Elmore Mfg. Co. Director several companies. Mem. Cleveland, Buffalo, Chicago Automobile clubs. Res., Clyde, O. Recreations, automobiling, boating.

Becker, John.—Hyde Park, Mass. Mfrs. vaporizers.

Becker, Louis.—1717 Deming Pl., Chicago, Ill. Garage.

Becket.—A small loop of rope passed through holes in the transom of a motor boat and knotted on its ends outside.

Beck, J. P.—Genesee Ave., Saginaw, Mich. Maxwell, Rambler, Ford

Beckley, G. D.—Treas. The Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.

Beckley-Ralston Co., The.—80-84 Michigan Ave., Chicago, Ill. Est. 1896. Dealers in sundries and supplies for motor cars, motor boats and bicycles. W. L. Beckley, Pres.; J. C. Ralston, Sec.; G. D. Beckley, Treas.

Beckley, W. L.—Pres. The Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.

Beck Livery and Auto Garage.—719 N. Illinois St., Indianapolis, Ind. (Pope-Toledo.)

Beck, M. J.—New Haven, Conn. (Lambert.)

Beckwith-Chandler Co.—320 5th Ave., New York City; 201 Emmett St., Newark, N. J. Mfrs. varnishes.

Beckwith, D. B.—Supt. Pope Motor Car Co., Toledo, O.

Becroft, L. H.—Ogden, Utah. (Reo.)

Bedard & Carlisle.—Lake St., St. Albans, N. Y. Garage.

Bedford Auto Garage.—220 Clinton Pl., Brooklyn, N. Y. Garage.

Bedford Garage Co.—1287 Bedford Ave., Brooklyn, N. Y. Garage.

Bed-plate.—A metal casting forming the foundation for a steam or gasoline engine.

Beebe, A. M.—441 Elm St., New Haven, Conn. Mfrs. auto tops.

Beebe, B. V.—Anaheim, Cal. Garage.

Beebe, H. C.—Sec. and Purch. Agt. Detroit Motor Car & Supply Co., 2230 Broadway, New York City.

Beebe, O. N.—Essex, Conn. (Locomobile, Cadillac, Winton.)

Beebe, Thos. S.—40 Tennis St., Albany, N. Y. Garage.

Beecher, J. S.—21 E. Church St., Newark, Ohio. (Cadillac.)

Beecher, Walter N.—Sec. and Mgr. Limousine Carriage Mfg. Co., Michigan Ave. and 35th St., Chicago, Ill.

Beelby Supply Co.—39 Fountain St., Grand Rapids, Mich. (Model.)

Beelman, Chas. S.—400 W. State St., Freemont, Ohio. (Oldsmobile.)

Beers Bros. Engine Co.—Rochester, N. Y. Mfrs. motor boats.

Beers, H. T.—Treas. New Haven Button Co., New Haven, Conn.

Beesing, L. C.—Pres. and Mgr. Buffalo Auto Body & Trimming Co., 338-340 Ellicott St., Buffalo, N. Y.

Begole, C. M.—Pres. Buick Motor Co. Flint, Mich.

Begole, George D.—Denver, Colo. Garage.

Behen-Faught Motor Car Equipment Co.—3961 Olive St., St. Louis, Mo. Est. Nov., 1906. Dealers in automobile supplies and accessories. John J. Behen, Pres. and Treas.; F. S. Behen, Vice-Pres.; S. F. Behen, Sec.; T. K. Shannon, Mgr.

Behen, F. S.—Vice-Pres. Behen Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo.

Behen, John J.—Pres. and Treas. Behen-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo.

Behen, S. F.—Sec. Behen-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo.

Behrens & Bushwell.—Main St., Ivoryton, Conn. (Cadillac, Winton, Stevens-Duryea.) Est. 1901. Garage (12 cars); repairing.

Behr-Zoller.—Stuttgart, Germany. Mfrs. radiators.

Belcher, A. S.—Market St., Campello, Mass. Garage.

Belcher Motor Co.—Fall River, Mass. Mfrs. gasoline marine motors.

Belden Auto Transmission Co.—1005 Bessemer Bldg., Pittsburg, Pa. Mfrs. transmission gears.

Belden, E. H.—Pres. The Belden Motor Car Co., 720 Bessemer Bldg., Pittsburg, Pa.

Belden, E. T.—Pres. Belden Machine Co., Whalby Ave. & Tryon St., New Haven, Conn.

Belden, E. W.—Sec. Belden Machine Co., Whalby Ave. and Tryon St., New Haven, Conn.

Belden Machine Co.—Whalby Ave. & Tryon St., New Haven, Conn. Mfrs. drop forgings, hardware specialties—forgings from blue prints or model. Cap. \$13,300. Est. 1865. E. T. Belden, Pres.; E. W. Belden, Sec.; A. B. Reed, Treas. and Gen. Mgr.

Belden Motor Car Co., The.—720 Bessemer Bldg., Pittsburg, Pa. Mfrs. automobiles, gas. (Six-cylinder car.)

Belfield & Co., H.—Philadelphia, Pa. Mfrs. castings (brass, bronze, aluminum and copper), auto clocks, brass pipe fittings, pressure gauges.

Belfoy et Cie, Simon.—68 rue de Vliiers, Levallois, Seine, France. Mfrs. pneumatic tires.

Belgica.—rue Van der Straeten, Brussels, Belgium. Mfrs. automobiles, gas. (Belgica cars.)

Belknap Mfg. Co.—Bridgeport, Conn. Mfrs. brass pipe fittings.

Belknap Motor Car Co.—Detroit, Mich. Mfrs. automobiles, steam.

Bell, A. W.—Stamford, Conn. (Jackson.)

Bell, Billmyer & Rotke.—211 W. 87th St., New York City. Garage.

Bell Bros.—Ravensthorpe, Yorkshire, England. Mfrs. automobiles, gas. (Bell cars.)

Bell, B. T.—166 Third Ave., N., Nashville, Tenn. Garage.

Bell, Chas. L.—824 Oak St., Columbus, Ohio. (Waltham.)

Bell, D. M.—Franklin and Michigan Sts., Chicago, Ill. Mfrs. tire pumps.

Bell, Herbert.—Director Chadwick Engineering Works, 3207 Spring Garden St., Philadelphia, Pa.

Bell, John M.—1201 Pacific Ave., Tacoma, Wash. (Columbia.) Est. 1905. Not Inc. J. M. Bell, Sales Agt.

Bell Mfg. Co., The.—113 Morgan St., St. Louis, Mo. Mfrs. metal polish.

Bell, S. R.—Pres. and Treas. Union City Body Co. Factory, West Pearl St., Union City, Ind.

Bell, W. H.—Pres. Chicago Tire Club, Chicago, Ill.

Bell, William.—Vice-Pres. Boston Steam Specialty Co., 170 Congress St., Boston, Mass.

Bell, W. L.—Kansas City, Mo. Mfrs. automobiles, gas.

Belle City Mfg. Co.—Racine Junction, Wis. Mfrs. gray iron castings.

Bellefield Motor Co.—4518 Henry St., Pittsburgh, Pa. (De Luxe, Pennsylvania, Queen.)

Bellefontaine Automobile Company.—Bellefontaine, Ohio. Makers of the Traveler Car. Cap. \$100,000. E. Ray Albaugh, Pres.; N. U. Smith, Vice-Pres.; W. R. Niven, Treas.; John P. Aiken, Sec., Gen. Mgr., Purch. Agt., Sales and Advt. Mgr.; H. E. Bombort, Designer and Supt.

Belle Isle Motor Co.—Detroit, Mich. Mfrs. motor boats.

Belle-Jardinère, Magasin de la.—2 rue du Pont Neuf, Paris, France. Mfrs. wearing apparel (hats, caps and coats).

Bellevue Automobile Station.—Ham-monton, N. J. (Cadillac.)

Bellevue-Stratford Garage.—Philadel-phia, Pa. (Colt Runabout.)

Bellinger, H. P.—Sec. and Treas. Chase Motor Truck Co., Syracuse, N. Y.

Bellinger's Garage.—10-12 Landers St., near Broadway, Newburgh, N. Y. Sup-plies; garage; repairing.

Bellows, M. S.—Chateaugay Lake, N. Y. Mfrs. motor boats.

Belmar Garage.—521 Homewood Ave., Homewood, Pa. Garage.

Beloit Automobile Club.—Harry M. Vale, Sec., Beloit, Wis.

Beloit Glove & Mitten Co.—217 Grand Ave., Beloit, Wis. Mfrs. wearing apparel (gloves and gauntlets.)

Belsize Motors, Ltd.—Clayton, Man-chester, England. Mfrs. automobiles, gas. (Belsize cars.)

Belt.—An endless band or strap of leather, cotton, rubber, etc., for trans-mitting power by pulleys with a smooth surface. Belts unfortunately elongate or contract according to the humidity of the atmosphere, and hence are apt either to grip too tightly or slip a little under the influence of the belt-drive. For this reason they have long been dis-carded on motor-cars, although they are much employed on motor-cycles, where

it is easy to give them the necessary ten-sion, owing to their comparative short-ness. They are made of flat and of round, or V section, in order to increase their adhesion upon the pulleys, which are themselves flat or grooved. For actuating oil pumps, fans, etc., steel belts are very often employed.

Belt-coupling.—The method of join-ing the ends of a belt, usually by lacing, riveting or metal hooks.

Belt, Crossed.—A belt so arranged as to run from the top of one pulley to the bottom of another, and cause the driven pulley to revolve in a direction reverse that of the driver.

Belt-dressing.—A sticky compound applied to a belt in order to increase its adhesion upon the pulley over which it passes. Also material such as oils, tallow, etc., applied to a belt in order to preserve it.

Belt-drive.—The transmission of power from the motor to the jack-shaft by means of one or more belts—a method of transmission now practically confined to motor-cycles, though even here it is often replaced by a chain.

Belt-fastener.—A metal hook for unit-ing the two ends of a belt.

Belt-fork.—See Fork.

Belt-shifter.—A device for sliding a belt from one pulley to another along-side of it. See Fork.

Belt-tightener.—A device for increas-ing the tension of a belt or chain. See Pulley, Jockey.

Belt, V.—A belt of which the section has the form of a trapezium. Belts of this form are mostly employed on motor-cycles.

Belvallette.—21 rue Duret, Paris, France. Mfrs. bodies.

Bemens, Frank.—Director Chadwick Engineering Works.—3207 Spring Gar-den St., Philadelphia, Pa.

Bemis Machine Co.—Lincoln St., Marl-boro, Mass. Garage.

Bemus Co., T. Alton, Inc.—358 Atlan-tic Ave., Boston, Mass. Mfrs. timers and distributors. Cap. \$5,000. Est. Oct. 20, 1906. T. Alton Bemus, Pres.; Thos. H. O'Shea, Treas.; Vinal W. Smith, Sec.

Bemus, T. Alton.—Pres. T. Alton Be-mus Co., Inc.—358 Atlantic Ave., Bos-ton, Mass.

Bénard, E.—25 rue Louis-Dory, Pré-St.-Gervais, Paris, France. Mfrs. leather tires.

Bendix Co., The.—2107 N. 9th St., Chi-cago, Ill. Mfrs. transmission gears, auto motors and complete chassis.

Benedict & Burnham.—Waterbury, Conn. Mfrs. brass and copper tubing.

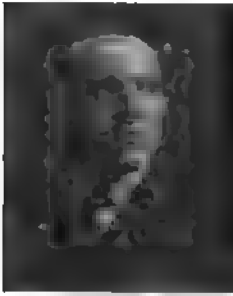
Benedict, J. H.—North Lewisburg, Ohio. (Waltham.)

Benefield Bros.—Columbus, Ind. (Queen.)

Benford, E. M.—497 W. Lincoln Ave., Mt. Vernon, N. Y. Mfrs. mica spark plugs. Est. 1902. M. Foltz, Head of Mechanical Dept.

Ben Hur Motor Co., The.—120 Randolph St., Chicago, Ill. Mfrs. gas automobiles, lubricators, automobile motors.

Benjamin, Charles Arthur.—B. July 26, 1869, at Syracuse, N. Y. Educated Syracuse High School. Occupation. General Mgr. and Director Aerocar Motor Co., Detroit, Mich. Member of Citizen's Club, Syracuse, N. Y.; New York



Motor Club, New York City; Automobile Club of Buffalo; Auto Club of Syracuse; Automobile Club of Cleveland; Commercial Club, Detroit, Mich. Residence address, 52 Marston Ave. & Beaufait Court, Detroit, Mich.; office address, cor. Mack

Ave. In the automobile trade since August, 1898; first owned car August, 1898; first car was an electric. purchased to start in the business; opened one of the first garages in New York State at Syracuse, N. Y., spring of 1899. Recreations, automobile touring and baseball.

Benjamin Electric Mfg. Co.—42 W. Jackson Blvd., Chicago, Ill. Mfrs. receptacle plug for charging storage batteries. Cap. \$50,000. Est. 1901. R. B. Benjamin, Pres.; W. D. Steele, Vice-Pres.

Benjamin Iron & Steel Co.—1102 D. S. Morgan Bldg., Buffalo, N. Y. Mfrs. iron and steel (sheet and bar.)

Benjamin, R. B.—Pres. Benjamin Electric Mfg. Co., 42 W. Jackson Blvd., Chicago Ill.

Benneckenstein, J.—Alte Jacobstrasse 139, Berlin, Germany. Mfrs. radiators.

Bennett, A. C.—24 N. 8th St., Minneapolis, Minn. (Winton.)

Bennet & Wood.—Sydney, Australia. (Monarch.)

Bennett, C. S.—Clarion, Iowa (Holman.)

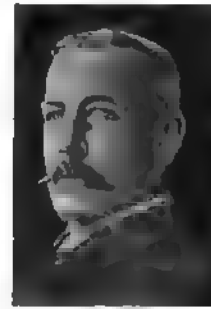
Bennett, E., Jr.—1203 S. Main St. Los Angeles, Cal. (Wayne, Crawford.)

Bennett Auto Co., E. J.—Gauyama, Porto Rico. (Wayne.)

Bennett, G. W.—Mgr. New York branch The White Co., Broadway and 62nd St., New York City.

Bennett, James Gordon.—Prop. New York Herald. B. New York City, May 10, 1841. Educated by private tutors. Inherited The Herald and large fortune,

1872; for a time issued a London edition and still published a Paris edition of



The Herald; inaugurated publication in England of storm warnings transmitted from U. S.; sent Henry M. Stanley to Africa to find Livingston, 1874-77; fitted out Jeannot's polar expedition, 1897; established 1883 (with John W. Mackay) the

Commercial (Mackay-Bennett) Cable Co.; is a prominent automobilist and yachtsman; presented a cup to the Automobile Club of France for the purpose of inaugurating an international automobile race. This cup is known as the James Gordon Bennett cup and is competed for annually. He presented a cup to be competed for under similar conditions to the Aero Club of France, 1906, which was won in the first contest by Frank Lahm in the balloon United States, representing America. Lives most of his time in Paris, but keeps active management of The Herald by cable. Residence 120 Champs Elysees, Paris, France.

Bennett, J. H.—Prop. and Gen. Mgr. Bay State Stamping Co., 380 Chandler St., Worcester, Mass.

Bennett, R. A.—Pres. and Mgr. Dover Garage Company, 74 East Blackwell St., Dover, N. J.

Bennett, R. Nelson.—Treas. Matheson Motor Car Co., Wilkesbarre, Pa.

Bennett R. R.—267 Green Ave., Brooklyn, N. Y. Garage.

Bennett's Auto Garage.—Oakland, Cal. Garage.

Bennis, J. H.—Sec. N. Y. & N. J. Lubricant Co., 14 & 16 Church St., New York City.

Benoist, H.—30 bis rue Bergere, Paris, France. Mfrs. spark plugs

Bensfield, C. R.—Dallas, Tex., Garage.

Benson, B. F.—1311 Keystone Bldg., Pittsburg, Pa. (American Mercedes, Rainier.)

Benson, E. R.—Sec. Hartford Rubber Works Co., 691 Park St., Hartford, Conn.

Benson, E. S.—Sec. and Treas. The G. & J. Tire Co., 549-625 E. Georgia St., Indianapolis, Ind.

Benson, Judson.—Head of Blacksmithing Dept., Graves & Congdon Co., Oak St., Amesbury, Mass.

Benson, Williams S.—Gen. Mgr. Delta Mfg. Co., Bloomfield, N. J.

Bentel, Geo. R.—607 Laughlin Bldg., Los Angeles, Cal. (American Mercedes.)

Bentell, O. F.—Sea Bright, N. J. Garage.

Benter, Worth S.—Catskill, N. Y. Mfrs. motor boats.

Benth, John P.—111 N. William St., Moberly, Mo. (Cadillac.)

Bentley Hair Co., Joseph.—Methuen Mass. Mfrs. curled hair.

Bentley, W.—Supt. Universal Elec. Storage Battery Co. Offices 188 La Salle St., factory 36-38 Union Park Pl., Chicago, Ill.

Benton & Stone.—Bracebridge St., Birmingham, England. Mfrs. tire pumps, jacks, spark plugs.

Benton Harbor Bicycle & Auto Works.—Benton Harbor, Mich. Garage.

Benton, J. W.—Vice-Pres. Chicago Vulcanizing Co., 1461-63 Michigan Ave., Chicago, Ill.

Benz, W. G.—246-50 3d Ave., South Minneapolis, Minn. (Rapid, Gale, Moline, Jackson.)

Benzene, called also "benzin" and "benzine" (especially by the French and Germans).—A hydrocarbon (phenyl hydride) of the aromatic series having the chemical formula C_6H_6 . It is an inflammable, colorless, volatile liquid lighter than water, with a density of 0.899. It solidifies at $32^\circ F.$ ($0^\circ C.$) and boils at $176^\circ F.$ ($80^\circ C.$). It is insoluble in water, but soluble in alcohol, ether, sulphide of carbon, etc. It is obtained in large quantities from coal-tar. It is an excellent solvent of many substances, rich in carbon, such as fats, resins and rubber, and is the starting-point in the manufacture of aniline dyes. Under the synonymous name of "benzole" it has been used to some extent in England and Germany as a fuel for internal combustion motors. (2) Benzine (sometimes improperly written "benzene"). A commercial and popular name in the United States for an inflammable, colorless, volatile liquid, consisting of a mixture of hydrocarbons of the marsh-gas series, and having a specific gravity of from 0.67 to 0.675 at $250^\circ F.$ ($120^\circ C.$) and boiling point of $129.2^\circ F.$ ($54^\circ C.$). It is obtained by the fractional distillation of petroleum. It is quite different, chemically, from benzene, which is a single hydrocarbon of constant composition. It is employed as a substitute for turpentine in painting, cleaning type, etc.

Benzol or Benzole.—The same as benzene. q. v.

Benzoline.—A synonym for benzine. See Benzine (2).

Benz u Cie., Rheinische Gastmotoren Fabrik Actiengesellschaft.—Mannheim, Germany. Mfrs. automobiles, gas; auto motors. (Benz cars.)

Bercley Cycle & Motor Works.—171 ave. de la Reine, Brussels, Belgium. Mfrs. Bercley motorcycles.

Beresford, H. A.—444 Drayton St., Savannah, Ga. Garage.

Berg & Brehmer.—238 Jefferson Ave., Detroit, Mich. Garage.

Bergdoll Motor Car Co.—323 N. Broad St. Philadelphia, Pa. (Benz, Welch.)

Bergen & West Side Auto Co.—2535 Hudson Blvd., Jersey City, N. J. Garage.

Berger Co., Joseph.—310-20 Hart St., Dayton, Ohio. Mfrs. jacks.

Bergers Automobile Co.—2025 Farnam St., Omaha, Neb. (Auburn, Wayne.)

Bergman, L. J.—Head of credit dept., Pass & Seymour, Inc., 52 Boyd Ave., Solvay, N. Y.

Bergmann Industriewerke, G. M. b. H.—Gagenau, Baden Germany. Mfrs. automobiles, gas. (Bergmann cars.)

Bergman, N. J.—Alder and 15th Sts., Portland, Oregon, Garage.

Bergner, A. A.—Sec. Webb Mfg. Co., 60 Shipman St., Newark, N. J.

Bergougnan et Cie, Société Générale des Établissements.—9 rue Villaret-de-Joyeuse, Paris, France. Mfrs. solid tires, non-skid bands, pneumatic tires.

Bergstrom, C. H.—Neenah, Wis. (Rambler, Ford.)

Bergstrom, Oscar M.—310 So. 9th St., Minneapolis, Minn. (Aerocar.)

Beringer, Geo. N.—5th & Federal Sts., Camden, N. J. Mfrs. anti-freezing solutions.

Berkeley Auto Co.—Berkeley, Cal. (American.)

Berks Auto & Garage Co.—Cherry above 5th St., Reading, Pa. (Jackson, Maxwell.)

Berkshire Cycle & Automobile Co.—95 Main St., North Adams, Mass. Est. since 1890 as Berkshire Cycle Co. Inc. 1906. Cap. \$5,000. A. S. Williams, Pres.; W. G. Parker, Treas.; M. L. Fero, Sec. Garage (six cars). Repairing.

Berliet, Automobiles.—Chemin des Quartres Maisons, Lyon-Montplaisir France. Mfrs. Automobiles, gas. (Berliet cars), automatic starters.

Berliet, Marius.—12 Chemin des Quartre - Maisons, Lyon-Montplaisir (Rhône). Born at Lyons Jan. 20th. 1866.



General manager of the Berliet works. In 1899 he began the construction of automobiles with three workmen and a capital of 4,500 francs (\$900); the Berliet establishments now covers 215,000 square feet of ground, em-

ploys 600 workmen, and turn out 1,200 automobiles a year.

Berlin Auto Garage.—Berlin, New Hampshire. (Cameron)

Berline.—A closed vehicle having one seat in front and two seats in the interior facing each other, and provided with three windows on each side and one window in front.

Berliner Akkumulatoren-Werke.—Chauseestrasse 59, Neusilberhof, Berlin, Germany. Mfrs. storage batteries.

Berliner Motorwagenfabrik, G. m. b. H.—Tempelhof, Berlin, Germany. Mfrs. automobiles, gas.

Berliner Verein Für Luft-schiffahrt. (Berlin Aero Club) Dresdenerstrasse 38, Berlin S. 14, Germany.

Bernard.—39 rue du Sentier, Paris, France. Mfr. wearing apparel. (coats.)

Bernard et Patoureaux.—71 bvd. Beaumarchais, Paris, France. Mfrs. shock-absorbers.

Bernhardt, O. P.—Vice-Pres. and Gen'l Mgr. Forest City Motor Car Co., 101-149 Walnut St., Masillon, Ohio.

Berin, Maurice Georges.—B. March 11, 1880, in Tours, France. College education. Occupation, Supt. Renault Frères Selling Branch, 1776 Broadway, New York City. Has been connected with the automobile trade since 1898, and a racing driver since 1899.

Berry Bros., Ltd.—Detroit, Mich. Mfrs. enamels, paints, varnishes.

Berry Foundry Co.—St. Joseph, Missouri. (Reo.)

Berry, W. E.—Second Vice-Pres. Carter Motor Car Corp., 409-10 Munsey Bldg., Washington, D. C.

Berthon, P.—17 cité Dupont, Paris, France. Mfrs. tire pumps.

Berton, F.—17 rue de la Cour des Noues, Paris, France. Mfrs. horns, tire pumps.

Bertram, N. H.—Owner and Mgr. Nevada Auto & Supply Co., 115 Ramsey St., Goldfield, Nevada.

Bertrand, John C.—Vice-Pres. and Gen. Mgr. Puritan Soap Co., 500-504 Exchange St., Rochester, N. Y.

Berwin Automobile Co.—128-132 N. 8th St., Allentown, Pa. Agt. for Elmore, Oldsmobile, Locomobile. Est. 1904. Cap. \$10,000. J. B. Gery, Pres.; J. D. Reber, Vice-Pres., and W. F. Wink, Treas. Garage (75 cars); repairing.

Bealy & Co., C. H.—15-21 S. Clinton St., Chicago, Ill. Mfrs. spiral disc grinders, spiral circles, taps, machinists tools, oils, brass, copper. Factory at Beloit, Wis.

Besnard-Crespin.—St-Branchs, Indre-et-Loire, France. Mfrs. motorcycles (l'Originale).

Besnard, Maris et Antoine.—60 bvd. Beaumarchais, Paris, France. Mfrs. acetylene lamps.

Besse, Louis.—39 rue de Lappe, Paris, France. Mfrs. transmission gears.

Bessemer Process.—The conversion of cast iron to steel by oxidizing the carbon by means of a current of air blown

through the iron while molten. The air oxidizes the carbon to carbonic monoxide, and, at the same time, maintains the iron at a suitably high temperature by such oxidation, until practically the whole of the carbon is removed.

Best Auto Repair & Storage Co.—1548 Broadway, Denver, Col. Garage.

Best, Leigh.—Sec. American Locomotive Automobile Co., Providence, R. I.

Best Mfg. Co.—Pittsburg, Pa. Mfrs. brass pipe fittings.

Bethlehem Automobile Club.—Wm. E. Matin, Sec. and Treas., Bethlehem, Pa.

Bethlehem Automobile Co.—Bethlehem, Pa., Mfrs. automobiles, gas.

Bethlehem Steel Co.—So. Bethlehem, Pa. Mfrs. steel castings, drop forgings, pressed steel frames, steel, chrome-nickel steel.

Bettes, O. H.—590 San Jacinto St., Dallas, Tex. (Mitchell.)

Betts, Ritchie Gregory.—B. May 8, 1869, at New Orleans, La. School education. Present occupation, Editor The Motor World, 154 Nassau St. Residence, 770 St. Nicholas Ave., New York City.

Betzin und Werner.—Berlin, Germany. Mfrs. goggles.

Betzman, Nicholas.—Treas. Motor Car Maintenance Co.—247-49 W. 49th St., New York City.

Beucher, L.—rue St. Pierre, St. Callais, Sarthe, France. Mfrs. elastic wheels.

Bevel-gear.—See Gear, Bevel.

Bevel-pinion.—See Pinion, Bevel.

Bevan, Eben L.—628-29 Connell Bldg., Scranton, Pa. Sales Agt. Kitsee Storage Battery Co.

Beverly Mfg. Co.—Beverly, Mass. Mfrs. transmission gears, marine reverse gears, machine work to order, gasoline, automobile and marine motors. Garage. Automobiles, gasolene, made to order.

Bevin Bros. Mfg. Co.—East Hampton, Conn. Mfrs. bells.

Beyster, Thorpe Co.—1329 Woodward Ave., Detroit, Mich. (Aerocar.)

Bezault, R.—16 bvd. de Villiers, Levallois, Seine, France. Mfrs. pneumatic rubber tires, non-skids.

Bezel.—The sloping edge of a cutting tool.

Bezner, F. O.—Sec. and Purch Agt., E. R. Thomas-Detroit Co., Jefferson Ave., Detroit, Mich.

B. G. S., Société Nouvelle des Accumulateurs.—34 rue Pierret, Neuill-sur-Seine, France. Mfrs. storage batteries.

Bianchi, Ed. e Co., Fabbrica d'Automobile e Velocipedi.—21 via Nino Bixio, Milan, Italy. Mfrs. automobiles, gas (Bianchi cars.)

Biayas, B. H.—Cumberland, Md. (Maxwell.) Garage.

Bibb.—A faucet, or cock, of the ordi-

nary form in which the nozzle is bent downward.

Bickel, O. H.—Supt. Acme Motor Car Co., 8th & Elm Sts., Reading, Pa.

Bickford & Francis Belting Co.—35 Pearl St., Buffalo, N. Y. Mfrs. belting, packing.

Bicycle Step Ladder Co.—65 Randolph St., Chicago, Ill. Mfrs. tire protector jacks, turntable and pit. Not Inc. Est. 1890, automobile dept. 1905. E. M. Murray, Prop.

Bicycling World and Motorcycle Review, The.—Published weekly by the Bicycling World Company, 154 Nassau St., New York City. Joseph Goodman, Pres.; R. G. Betts, Treas.; F. W. Roche, Sec.

Biddle & Smart Co.—Amesbury, Mass. Mfrs. wood and metallic bodies.

Biddle, W. A.—Richwood, O. (Maxwell)

Biehl's Carriage Wks.—Reading, Pa. Garage.

Bielefelder Nachmaschinen und Fahrradwerke.—Bielefeld, Germany. Mfrs. motorcycles.

Bielefelder Press und Ziehwerke Actiengesellschaft.—Brackwede-Bielefeld, Germany. Mfrs. pressed steel frames.

Bielus Motor Co., The.—Saginaw St., & M. C. Ry., Lansing, Mich. Mfrs. gasoline automobile motors.

Biever, L. N.—56 Elizabeth St., Derby, Conn. (Maxwell.)

Big End.—The enlarged lower end of a gas-motor connecting-rod which carries the crank-pin bearing. The piston end of the rod is sometimes termed the "little end."

Big 4 Auto Co.—110 East 9th St., Los Angeles, Cal. (Marmon, Monarch, Model.)

Big 4 Spark Plug Co.—104 John R. St., Detroit, Mich. Mfrs. spark plugs.

Bight.—A loop in a rope or chain.

Biko Mfg. Co.—Hubbardson, Mass. Mfrs. tire fluid.

Bilge.—That part of the floor of a boat, on each side of the keel which approaches nearer to a horizontal than perpendicular direction and begins to round upward.

Bilge-pump.—A small pump to carry off water which may lodge around the lee bilge.

Bilgeri, Wurzer und Co.—Helioswerke, Bregenze-Laibach, Austria. Mfrs. motorcycles, automobiles, gas. (Helios.)

Billings & Spencer Co.—Russ & Lawrence Sts., Hartford, Conn. Mfrs. wrenches, machine wrenches, pliers, hammers, packer ratchets, lathe tools, screw-drivers, drop-hammers, automobile forgings, etc., etc. Cap. \$250,000. Est. 1869. C. E. Billings, Pres.; F. C. Billings, Vice-Pres. and Supt.; E. H. Stocker, Sec.; S. H. Holt, Treas.

Billings, C. E.—Pres. Billings & Spencer Co., Russ & Lawrence Sts., Hartford, Conn.

Billings-Chapin Co., The.—Cleveland, O. Mfrs. paints, varnishes.

Billings, F. C.—Vice-Pres. and Supt., Billings & Spencer Co., Russ & Lawrence Sts., Hartford, Conn.

Billings, Frank—Worcester, Mass. (Knox.)

Billington Motor Car Co.—605-7-9 W. 7th St., Los Angeles, Cal. (Knox trucks and automobiles.) Est. March 1, 1907.

Bill, John T.—10th & Main Sts., Los Angeles, Cal. (Stoddard Dayton.) Supplies.

Billy, C.—1 rue Jean Stas, Brussels, Belgium. Mfrs. oil and acetylene lamps.

Bilz, Chas.—1432-38 Court pl, Denver, Col. Agent; Packard, Franklin, Buick. Est. 1902, Charles Bilz, Prop.; W. J. Hunter, Shop Foreman. Garage (50 cars). Repairing.

Binding.—See Seizing.



Binding-post.—A screw clamp for attaching a conducting wire to an electrical instrument. In the figure, E is the connecting nut; P the post; and V the binding-screw.

Binding-screw.—See Screw, Binding.

Bindrim, Julius.—1057 Bedford Ave., Brooklyn, N. Y. Supplies.

Binford's Auto Station.—1287-1289 West Lake St., Chicago, Ill. Est. 1904. Todd E. Binford, owner. Garage (100 cars). Repairing.

Bingham's Auto Garage.—Grand River Ave. and 5th St., Detroit, Mich. Repairing.

Binghamton Automobile Club.—S. M. Frechie, Sec., Binghamton, N. Y.

Binghamton Motor Car Co.—172-176 State St., Binghamton, N. Y. Agts. Pope-Toledo, Pope-Hartford, Buick, Columbia, Knox, Babcock Electric, Pierce Arrow. Est. Jan. 1, 1906. H. W. Brown, Mgr. Garage (60 cars). Repairing.

Binkley, F. C.—Mgr. auto dept. The Turner Brass Works, Sycamore and Illinois Sts., Chicago, Ill.

Binnacle.—A housing for a vessel's compass.

Binns, Andy.—207 Grand Ave., Oklahoma City, Okla. (Pope-Toledo.)

Bird, A. D.—Treas. Camden Anchor-Rockland Machine Co., Camden, Me.

Bird, C.—Supt. Jackson Automobile Co., Jackson, Mich.

Bird, Geo. H.—Co-partner, Bird-Sykes Co., 1470 Michigan Ave., Chicago, Ill.

Bird, John.—Pres. and Mgr. Camden Anchor-Rockland Machine Co., Camden, Me.

Birdsall, Edward Tracy.—Chief Engineer Selden Motor Vehicle Co. B. at Cumberland, Md., April 14th, 1863; educated private and public schools C. C.

N. Y. and Stevens Institute of Technology ('86 M. E.). Member N. Y. Athletic, Rochester A. C., Rochester Yacht, Rochester, A. C. A., A. I. E. E., Soc. Auto. Eng. (Sec'y). Connected with motor field since 1899. Recreation: Yachting. Res., 68 Merriman St.; office, Berkley Bldg., Rochester, N. Y.

Birdsong & Potchernick.—San Antonio, Tex. (Maxwell.)

Bird-Sykes Co.—1470 Michigan Ave., Chicago, Ill. Middle West Distributors for Corbin cars. Est. 1904. Cap. \$10,000. Geo. H. Bird and B. G. Sykes, Proprietors; R. B. Nettleton, Sales Mgr.; E. H. Dooley, Head of Repair Department. Repairing.

Bird & Co., W. Hobart.—Coventry, Eng. Mfrs. Hobart motorcycles, quads, tricars.

Birmingham Garage.—121 South 20th St., Birmingham, Ala. (Maxwell, Stoddard-Dayton.)

Birmingham Small Arms & Metal Co.—Birmingham, Eng., Mfrs. chains, metallic wheels.

Birnie, H. T.—Sales Mgr. Bryant Motor Co., 110 W. 41st St. and 1675 Broadway, New York City.

Bishop & Co., The J. H.—Wyandotte, Mich. Mfrs. automobile robes.

Bishop, B. T.—Vice-Pres., Bishop, McCormick & Bishop, 18-20 Halsey St., Brooklyn, N. Y.

Bishop & Darling.—1291 Bedford Ave., Brooklyn, N. Y. (Berkshire.)

Bishop, Chas. R.—Pres. American Motor Truck Co., Caledonia St., Lockport, N. Y.

Bishop, C. M.—Sec. Bishop, McCormick & Bishop, 18-20 Halsey St., Brooklyn, N. Y.

Bishop, E. H.—Pres. Bishop McCormick & Bishop, 18-20 Halsey St., Brooklyn, N. Y.

Bishop, E. R.—Sec. and Treas. The Kilborn & Bishop Co., Lloyd St., cor. Chapel, New Haven, Conn.

Bishop Gutta-Percha Co.—425 E. 25th St., New York City. Mfrs. insulated wire.

Bishop, McCormick & Bishop.—18-20 Halsey St., Brooklyn, N. Y. Agts. Ford, Dragon. Est. Dec. 1906. Cap. \$51,000. E. H. Bishop, Pres.; J. McCormick, Jr., Treas.; B. T. Bishop, Vice-Pres.; C. M. Bishop, Sec. Garage (100 cars). Repairing.

Bishop, W. H.—Athens, Georgia. (Logan, Maxwell.)

Bisiaux, Georges.—11 rue Petit, Paris, France. Mfrs. radiators.

Bismarck Fahrradwerke Gesellschaft.—Bergerhof, Rheinisch-Preussen, Germany. Mfrs. Bismarck motorcycles.

Bismarkhütte Actiengesellschaft.—Bismarkhütte, Schientochlowitz, Silesia, Germany. Mfrs. pressed steel frames.

Bismuth.—A metal found disseminated through various rocks, from which it is separated by simple exposure to heat. It is highly crystalline and very brittle. It has a reddish white color and a density of 9.9. It melts at about 500° F. (260° C.). It is remarkable as being the most diamagnetic of all known bodies. An alloy consisting of 8 parts of bismuth, 5 of lead and 3 of tin constitutes what is known as fusible metal, which melts below 210° F. (100° C.).

Bispham, C. P.—Mgr. New York Branch Trident Tire Co., 1593 Broadway, New York City.

Bissell, Clarence H.—Gen. Supt. Murphy Varnish Co., Newark, N. J.

Bissett, F. H.—529 S. Second Ave., Minneapolis, Minn. (Indian.)

Bisantz, F.—Supt. Logan Construction Co., 2296 Carrol St., Chillicothe, O.

Bit.—A term applied to certain boring tools used with a brace, such as the twist bit, center bit, etc.

Bitt.—A post secured to the deck of a boat, and to which cables, etc., are made fast.

Bittner, M. & Co.—Thaborstrasse, 108, Vienna, Austria. Mfrs. acetylene lamps.

Bitumens.—A series of carbon compounds of the olefiant and paraffin groups, and which usually occur as mixtures. Some of the principal members are asphalt, naphtha, petroleum, etc. See Asphalt.

Bjorneby, Eliot.—KalisPELL, Mont. (Waltham.)

Black, A. B.—21 S. Market St., Boston, Mass. Mfrs. spark timing devices.

Black Auto Co., Sid.—630 Walnut St., Cincinnati, O. (Buick, Franklin, Lozier.) Supplies; garage; repairing; renting.

Blackburn Wm. M.—Purch. Agt., F. B. Stearns Co., Euclid Ave., Cleveland, O.

Black, C. A.—Vice-Pres. Cadillac Motor Car Co., 1343 Cass St., Detroit, Mich.

Black Lead.—See Graphite.

Black Mfg. Co.—Fort Wayne, Ind. Mfrs. gas automobiles.

Black, Sid.—Pres. Sid. Black Automobile Co.—630 Walnut St., Cincinnati, O.

Blackham & Son.—30 High St., Coventry, England. Mfrs. goggles.

Black Hills Mica Co.—Auburn, N. Y. Mfrs. mica.

Blackington & Co., V. H.—Attelboro Falls, Mass. Mfrs. name plates.

Blackiston, A. H.—Vice-Pres. Pittsburg Automatic Vise & Tool Co., Wabash Bldg., Pittsburg, Pa.

Blackiston, G. P.—Pres. and Gen. Mgr. Pittsburg Automatic Vise & Tool Co., Wabash Bldg., Pittsburg, Pa.

Blackmore, C. C.—Office Mgr. Citizen's Motor Car Co., N. E. cor. Seventh and Main Sts., Cincinnati, Ohio.

Black, S. C.—222 N. Church St., West Chester, Pa. (Rambler.)

Blair, C. M.—Billings, Mont. (White.)

Blairlight Co.—Northboro, Mass. Mfrs. automobiles, steam.

Blair, Wiley.—Wichita Falls, Tex. (Buick, Waltham.)

Blaisdell Bros.—Rockford, Ill. (Cadillac.)

Blaisdell Machine Works.—6th St. & C. R. R. of N. J., Vineland, N. J. (Pope-Toledo.)

Blaisdell, Walter F.—58 Palmetto St., Brooklyn, N. Y. (Walter.)

Blake Co., E. P.—21 Hawkins St., Boston, Mass. (Jackson, Monarch, Logan.)

Blake, Edwin J.—565 Winslow St., Hartford, Conn. Mfrs. brass, bronze, aluminum and copper castings, bronze metals.

Blake, G. W.—Colorado Springs, Col. (Merkel.)

Blake, H. M.—Supt. Locomobile Co. of America's branch at 400 Newbury St., Boston, Mass.

Blake & Johnson.—Waterbury, Conn. Mfrs. bolts, nuts, special automobile machinery, machine work to order, screw machine products, screws.

Blake Steam Pump Co.—356 Arborway, Jamaica Plain, Mass. Mfrs. condensers

Blakeslee, D. S.—Sec. and Treas. Blakeslee Forging Co., Plantsville, Conn.

Blakeslee Forging Co.—Plantsville, Conn. Mfrs. drop forgings, carriage hardware. Cap. \$50,000. Est. 1877. S. Blakeslee, Pres.; Geo. W. Blakeslee, Vice-Pres.; D. S. Blakeslee, Sec. and Treas.

Blakeslee, G. E.—Pres. and Gen. Mgr. Crescent Automobile Co., 2565 Boulevard, Jersey City, N. J.

Blakeslee, Geo. W.—Vice-Pres. Blakeslee Forging Co., Plantsville, Conn.

Blakeslee, L. J.—Treas. Crescent Automobile Co., 2565 Boulevard, Jersey City, N. J.

Blakeslee Mfg. Co.—Plantsville, Conn. Mfrs. metal trimmings.

Blakeslee, S.—Pres. Blakeslee Forging Co., Plantsville, Conn.

Blanchard, A. W.—10 Clinton St., Brooklyn, N. Y. Mfrs. tire tools.

Blanchard, E. H.—Waterbury, Conn. (Pope-Hartford.)

Blanchard, L. E.—Supt. The Hofecker Co., Motor Mart, Park Square, Boston, Mass.

Blanchard Machine Co.—64 State St., Cambridge, Mass. Repairing.

Blank.—A piece of metal roughly cut, cast or forged to a particular shape ready for accurate working up by hand or machine

Blankenagel, Gebrüder.—Bielefeld, Germany. Mfrs. tire pumps.

Blanke und Rest.—Leipzig-Plagwitz, Germany. Mfrs. circulating pumps, lubricators, carbureters.

Blasier Mfg. Co., M. E.—65 Columbia St., Utica, N. Y. Mfrs. automobile tops, glass wind shields. Cap. \$50,000. Est. 1885. M. E. Blasier, Pres. and Treas.; F. A. Klein, Vice-Pres. and Sec.

Blasier, M. E.—Pres. and Treas. M. E. Blasier Mfg. Co., 65 Columbia St., Utica, N. Y.

Bleeg, John P.—Sec. and Mgr. Henry H. Van Brunt Co., Sioux Falls, South Dakota

Blenner, B. A.—1602 W. Broad St., Richmond, Va. (White, Winton, Dragon, Pierce Arrow.)

Blériot, Société, Anonyme.—14 rue Duret, Paris, France. Mfrs. acetylene lamps.

Blessing, J. W.—Risingsun, Ohio. Agt. Cartercar. Est. in automobile business 1906. Not Inc.

Blewett, B. W.—Denton, Tex. (Waltham.)

Blin.—53 bis, rue Croulebarde, Paris, France. Mfrs. storage batteries.

Bliss, A. R.—Sec., Treas. and Gen. Mgr. New England Motor Co., 82-88 Fletcher St., Lowell, Mass.

Bliss, Chas. P.—Denver, Col. Mfrs. automobile tops.

Bliss-Chester Co.—31 Mathewson St., Providence, R. I. Mfrs. duplex wire terminals and flexible battery connectors.

Blisters.—Bunches or protuberances in the side of a pneumatic tire, caused either by sand working through a cut and collecting in one or more places, or by the separation and granulation of the rubber between each layer of fabric.

Blister Steel.—See Steel, Blister.

Blizard, Charles.—Third Vice-Pres. Electric Storage Battery Co., Allegheny Ave. and 19th St., Philadelphia, Pa.

Bloch, Julien Ernest.—B June 12,

1870, at Paris,

France. Graduate

of Mechanical

School. Inventor.

Present occupa-

tion. Importer

Motobloc cars.

Member of As-

sociation Génér-

ale Automobiles

(A. G. A.) France.

Connected with

automobile trade

since 1869. Resi-

dence, 250 W.

84th St., 244 W. 69th St., New York City.

Block.—A wood or metal frame carrying the pulleys in a lifting tackle. See Pulley.



Block Bros.—9 Water St., Mobile, Alabama. (Rambler.)

Block, Pillow.—See Pillow-block.

Blocker, A. L.—Columbia, Tenn. Garage.

Blodgett & Co., V. E.—Santa Ana, Cal. (Holsman.)

Blomberg & Co., Frank C.—346 Madison St., Memphis, Tenn. (Buick, White, Baker.)

Blomstrom Mfg. Co., The.—Detroit, Mich. Mfrs. automobiles, gas.

Blomstrom Mfg. Co., C. H.—Cor. Clark & Jefferson Aves., Detroit, Mich. Makers of the Queen car, first marketed 1902. Eight models made since. Cap. \$200,000. N. M. Kaufman, Pres.; D. W. Kaufman, Vice-Pres. and Gen. Mgr.; D. McCracken, Sec. and Treas.; F. S. Davis and J. A. Herzog, Designers; J. A. Locher, Supt.; W. A. Westcott, Purch. Agt.; Geo. Horn, Asst. Purch. Agt.; H. S. Leyman, Sales Mgr.; F. T. Larson, Advt. Mgr.

Blondel la Rougery.—24 passage du Havre, Paris, France. Mfrs. road maps.

Blood Bros. Machine Co.—Kalamazoo, Mich. Mfrs. gasoline tank gauges, steering apparatus, universal joints.

Bloom, A. J.—Hamburg, N. J. (Walsham.)

Bloomer, R. E.—Keithsburg, Ill. Mfrs. oil cans.

Bloomington Automobile Club.—Henry Thobro, Sec., Bloomington, Ill.

Bloomington Automobile Garage.—315 E. Front St., Bloomington, Ill. Garage.

Bloomsburg Automobile Club.—C. W. Funston, Sec., Bloomsburg, Pa.

Bloomsburg Auto Co.—East & Third Sts., Bloomsburg, Pa. (Franklin.)

Blough, W. R.—Treas. Harrisburg Auto Co., 39th and Hamilton Sts., Harrisburg, Pa.

Blount, F. J.—Head of Battery Dept., Helios Mfg. Co., Bridesburg, Philadelphia, Pa.

Blow.—An electrical fuse or cut-out is said to "blow" when it burns out and breaks the circuit.

Blow.—The same as "blow-hole," q. v.

Blow-back.—A return of gas, whether ignited or not, through the inlet-valve into the carburetter, and which causes a loud popping.

Blower.—A wheel with curved buckets revolving in a circular case and designed for the production of a current of air. The air is drawn in through an opening at the center and discharged through a pipe connected with an outlet at the periphery. The figure gives a diagram of a common form.

Blowhole.—A cavity, called also an "air hole," in a casting caused by a bubble of air which passes from the core outward and is retained in the metal.



Blowing Off.—Driving out all of the water in a steam boiler, in order to expel the sediment.

Blow-off Cock.—See Cock, Blow-off.

Blow-off Pipe.—A pipe fixed to the bottom of a steam boiler, for discharging sediment, by blowing through a portion of the water from the generator.

Blow-off Valve.—See Valve, Blow-off.

Blow-out.—A fracture in the casing and inner tube of a pneumatic tire caused by the gradual weakening of the fabric, through separation and chafing.

Blowpipe.—A curved tube with a fine aperture used to direct a jet of flame upon an object which has to be submitted to a high temperature.

The blowpipe used in the industries for soldering, brazing, etc., consists of two cylindrical tubes arranged concentrically in such a way as to leave an annular space between them. Through this space is sent, under pressure, a gas very rich in carbon (such as illuminating gas, for example), and the combustion of which is quickened by a blast of air sent through the central tube. Extremely high temperatures are obtained through the use of oxygen and hydrogen, mixed at the tip of the blowpipe.

The most powerful and economical blowpipe now used is one in which a mixture of acetylene and oxygen is employed. The temperature at the tip of this easily reaches 5430° F. (3000° C.), and permits of the autogenous soldering of such metals as iron, copper, nickel and aluminum. See Soldering, Autogenous.

Blow-torch.—See Torch, Blow.

Blueing.—In tempering steel, the production of a blue tint by heating the metal to about 570° F. (300° C.). Steel springs are so tempered.

Blue Grass Auto Co.—Lexington, Ky. (Stoddard-Dayton.)

Blue Ribbon Garage Co.—112 E. 75th St., New York City, Garage.

Blue Ribbon Garage.—291 Fairfield Ave., Bridgeport, Conn. (Columbia, Winton, Cadillac, Franklin, Lozier.) Supplies, garage, repairs.

Blue Ribbon Auto & Carriage Co.—130-170 Cannon St., Bridgeport, Conn. Mfrs. wood and metallic bodies, auto tops.

Blue-stone.—A common name for copper sulphate, q. v.

Blucmel, C. W. & Bros.—Wolston Coventry, England. Mfrs. storage batteries.

Blum, E.—130 ave d'orleans, Paris, France. Mfrs. coils.

Blumenthal, D.—Vice-Pres. American Machine Mfg. Co., cor. Champlain and Beaubien Sts., Detroit, Mich.

Blumenthal, Harry S.—Pres. American Machine Mfg. Co., Champlain and Beaubien Sts., Detroit, Mich.

Boardman, Mrs. N. J.—Sec. Chicago Women's Motor Club, Chicago, Ill.

Boas, Hans.—Krautstrasse 52, Berlin, Germany. Mfrs. high tension magnetos.

Boas, Rodriques, et Cie.—67 blvd. de Charonne, Paris, France. Mfrs. acetylene and oil lamps.

Boat, Gliding.—See Hydroplane.

Boat, Hydroplane.—A type of racing craft in which an effort is made to lift the boat clear, or partially clear, of the water and drive it along on a series of slightly inclined planes. One of the latest types, that of Levavasseur, consists of a front boat for holding the motor, and to which is attached a light wooden frame for carrying a long tail, at the rear end of which is the propeller.

Boat, Motor.—A term, along with "auto-boat," and "power-boat," now usually applied to small vessels propelled by an internal combustion motor using gasoline. The motor of such a boat is of some standard type. In the smaller types a motor with a two-stroke cycle is employed, since its lower speed is advantageous when the motor is connected directly to the shaft of the propeller, and as the two-cycle motor can be readily reversed this combination eliminates the necessity for a reversing-gear. The propeller is often made reversible (see Screw, reversible). The blades being capable of being moved in such a way as to reverse their direction, the necessary movement being effected by a lever in the boat, connected by a rod to a sleeve on the hub or boss of the propeller. A reversing-gear is most generally used where a high power motor is installed, being constructed of metal or rawhide gears, or of the planetary type. The size of the boats now in use is from 15 to over 100 feet in length, and of from 1½ to 150 h. p., or greater. The whole of the motor, with working parts, control-lever, etc., is carried on a single bed-plate so that the boat having been prepared, it falls into place without elaborate bolting or fitting, and the whole can be easily inspected.

Boat, Racing.—All motor-boats, for racing purposes, are divided into two classes, "racers," and "cruisers." A racing boat is one whose rating is at least two and one-half times the square root of her load water line length; all other boats are classed as cruisers. When a boat by reason of the difference in rating for horse-power between racer and cruiser may rate in either division she is classed as a racer.

Boats are rated for time allowance according to the following formula:

$$V = C \sqrt{\frac{P \times \sqrt{L}}{D}}$$

in which V is the speed in nautical miles per hour; C is a constant which for racers is 11 and for cruisers 9.7; P is the

power determined by the following horse-power formula; L is the length of the water line in running condition, and D is the displacement in cubic feet.

Horse-power: The horse-power for 4-cycle motors having a stroke of six inches or over, is determined by the following formula:

$$P = \frac{A \times N}{2}$$

The horse-power for 4-cycle motors having less than six inches stroke:

$$P = \frac{A \times N \times S}{12}$$

The horse-power for 2-cycle motors having a stroke of six inches or more, the formula becomes

$$P = \frac{A \times N}{1.65}$$

The horse-power for 2-cycle motors under six inch stroke:

$$P = \frac{A \times N \times S}{10.2}$$

In these formulas (P) equals horse power; (A) equals the area of one cylinder in square inches; (N) equals the number of cylinders; (S) equals the stroke in inches.

The above ratings and formulas have been adopted by the Motor Boat Club of America, under whose auspices the Hudson River races, etc., are run.

Bobbins.—A spool of wood or other material wound with insulated wire.

Bockhacker, Hans.—Sec. and Treas. Funk Engineering Co., 39-45 Fourteenth St., Hoboken, N. J.

Bocquet, J.—rue Jacques-Dolphin, Carouge-Genève, Switzerland. Mfrs. bodies.

Bock und Hollender.—72 Hauptstrasse, Vienna, Austria. Mfrs. automobiles, gas.

Boda & Co., Robert F.—20-22-24 East Rich St., Columbus, O. Agts. for National, Mitchell. Est. 1905. Garage, 50 cars. Repairing.

Body-hangers.—The same as spring-hangers, q. v.

Boehny, R.—Zürich, Switzerland. Mfrs. spark plugs.

Bogan, John G.—Treas. and Gen. Mgr. Sports Ltd., 2049 Bdw., New York City.

Boh, John F.—Head of Dept. New York and Brooklyn Auto Supply Co., 1717 Bdw., New York City.

Bohn, Chas. B.—Sec. and Treas. Allyn Brass Foundry Co., Cleveland, Detroit and Buffalo, Mgr. Detroit Plant.

Bohnet, Geo. J.—114 S. Franklin St., Saginaw, Mich. (Reo.)

Boiler.—The source of motive power of a steam-engine. The boilers used on steam-cars are of the tubular variety and either of one of two kinds design-

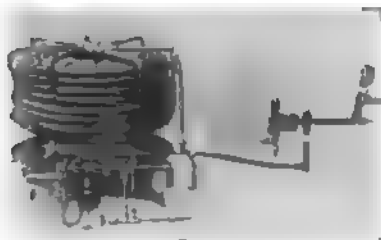
nated, respectively, as "fire-tube boilers" and "water-tube boilers" according as to whether the tubes are designed to contain hot gases of combustion or water.

(1) **Fire-tube Boilers.**—These generators, which have been chiefly developed in America, are rarely over a foot in diameter or height, but the wide heating surface obtained by the multiplicity of fire-flues renders them capable of generating a working-pressure of from 150 to 180 pounds to the square inch. The tubes of such boilers are usually of copper, cold-drawn and expanded into the tube-plates at each end of the steel boiler-shell. One of the most serious difficulties with these small boilers is the danger of "priming," although this in some instances is surmounted by the use of a baffle-plate fixed above the water-level, and, sometimes, in connection therewith, of a "separator"—a pipe of wide diameter extending across the top plate of the boiler and united to the motor by another pipe within it provided with a number of small holes.

(2) **Water-tube Boilers.**—In automobile practice, preference has been accorded to this type owing to the fact that by their use quicker steaming and greater durability are secured. Calcareous matter precipitated from the water is more easily prevented from forming "scale," since it is directed into a mud-drum at the bottom of the water-chamber, whence it can be readily removed. On the other hand, water-tube boilers have the drawback of bulkiness and complicated construction, and greater liability to foaming and priming.

Boiler, Finger-tube.—A type of steam generator which, instead of fire tubes or coils, has the bottom crown-plate fitted with a number of suspended "finger-tubes," through which the heated gases are forced to circulate.

Boiler, Flash.—A type of steam generator invented by Leon Serpollet in 1889, and which consisted of a coil of steel tubing flattened until the bore was of almost capillary width, and surrounded by a cast-iron covering. A pump at



each stroke injected into the coil a small quantity of water which was converted into steam almost instantaneously. Several manufacturers, working along the lines of Serpollet's "instantaneous gener-

ator," with its numerous advantages in point of quick steam, high pressure capacity, freedom from scale, etc., have produced improved "flash-boilers" of similar description. By making the tubes of such generators of sufficient capacity to vaporize a good quantity of water, high temperatures may be obtained in a short time and high power engines be driven with perfectly dry steam. The figures give a lateral view (without shell) of the White flash boiler.

Boiler-shell.—The external covering of a steam generator.

Boiler, Tube-plug.—A steam-car boiler in which the lower crown-plate contains threaded perforations, into which U-shaped tube-plugs are screwed. The circulation of the water is downward at the center of the tube clusters and upward through the outer legs. Quick and ready steaming, prevention of scale, and impossibility of burning are some of the advantages claimed for this construction.

Boiling.—In the ordinary sense, the production of vapor throughout the mass of a heated liquid, which occurs under normal pressures, at a definite temperature called the "boiling point." See Ebullition. (2) In the charging of secondary batteries, the bubbling of hydrogen and oxygen gases as they escape from the liquid. See Gassing. (3) The stage of the Bessemer process during which the carbon is being oxidized to carbon monoxide.

Boiron, J.—32 rue de Tilsit, Paris, France. Mfrs. spark plugs.

Boissette, Emile.—260 blvd. Voltaire, Paris, France. Mfrs. motorcycles.

Boker & Co., Herman.—101 Duane St., New York City. Mfrs. sparking points, steel, brass and copper metals.

Boland & Bros., F. E.—Grand and Oliver Sts., Rahway, N. J. (National.)

Boland Motor Co., F. E.—239 Halsey St., Newark, N. J. (National.)

Boldt & Son, G. H.—Locust and 4th Sts., Dubuque, Iowa. Garage.

Bolide, Société Anonyme des Automobiles.—5 rue Duranti, Paris, France. Mfrs. automobiles, gas. (Bolide cars.)

Bolleé, Usines Léon.—Le Mans, France. Mfrs. automobiles, gas. (Léon Bolleé.)

Bols, Petrus.—rue Haute, Malines, Belgium. Mfrs. wood wheels.

Bolton Automobile Co.—100-106 Dalplins St., Baltimore, Md. Agts.; Ford, Reo. and Premier. Est. May, 1906. Not Inc. A. S. Brown, Prop. Garage (24 cars). Repairing.

Bolt.—A bolt is a screw, usually of iron or steel, terminated by a nut, (Fig. 1). The shank of the bolt is generally distinguished from that of the screw in being but partially threaded. In diameter, length and threading, the

bolt varies greatly. Every nut forms a constituent part of its bolt.

The bolt is either free (Fig. 1) or per-

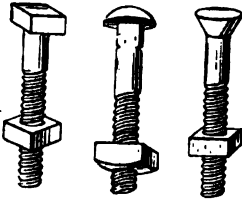


Fig. 1

manent. When it is free, that is to say, detachable from the pieces that it unites, it is sometimes provided with a snug (Fig. 2), a projection which engages with a recess in the piece. This arrange-

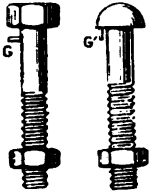


Fig. 2

ment is used when the bolt-head is difficult to reach, and an effort made to screw the nut upon it would cause it to revolve. The snug should be placed in the head of the bolt (Fig. 2, G'). If placed in the shank (Fig. 2, G), it weakens it, sometimes with disastrous consequences, especially in cases in which the defective bolts hold the bearings of connecting-rod heads.

The bolt is called a "stud-bolt" (Fig. 3) when a portion of its shank is screwed

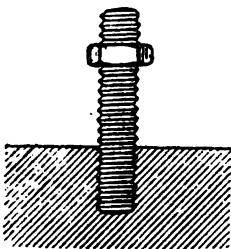


Fig. 3

permanently into a piece, and becomes, in a manner, an integral part of it, through soldering or brazing, or simply through a forcible screwing to make the

threads grip it with tenacity. In such a case the bolt-head is replaced by the piece itself.

Bolts have heads of very different form: according to the purpose for which they are to be used. In common bolts, the kind mostly employed in carriage bodies, the head is sometimes square, and the nut six-paned, that is, provided with six facets on its periphery. Sometimes also the head has the same

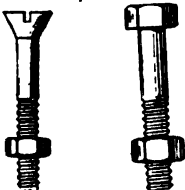


Fig. 4



Fig. 5

form (Fig. 5), and occasionally it is made round, and, for particular purposes, it is conical, but oftener pyramidal (Fig. 4). When of the latter shape it is intended to come flush with the surface into which it is inserted, and in that case is said to be "countersunk."

The holes into which bolts are to be inserted should have, as nearly as possible, the same diameter as the bolts themselves, otherwise the latter might have a play that would quickly cause them to shear and break.

Bolt, Countersunk.—A bolt with a conical head to fill a countersink. See Bolt, Fig. 4.



Bolt, Double-ended.—A bolt used for holding together three objects independently of each other.

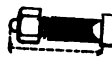


Bolt, Eye.—A bolt used for securing the gland to a stuffing box, or for other purposes, such as for receiving a ring, lever or rope.

Bolt, Fang.—A bolt with pointed teeth formed on the nut, and which sink into the wood through which the bolt passes and prevent its rotation.

Bolt, Flush.—One, the head of which is let down even with the surface.

Bolt, Gland.—One of the several bolts which hold a gland in place. See Gland.



Bolt, Holding-down.—A bolt used to hold down a machine, motor, etc.

Bolt, Lag.—See Screw, Lag.

Bolt, Rag.—A bolt with a jagged end to prevent withdrawal.

Bolt, Ring.—A bolt with an eye in the end, through which a ring passes.

Bolt, Security.—The same as "tire bolt."

Bolt, Set.—A bolt used by shipwrights in closing up planks.

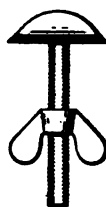
Bolt, Snug.—A bolt provided with a "snug" or small projection under the head in order to prevent the bolt from turning. See Snug, Fig. 2.

Bolt, Stay.—See Bolt, Tire.

Bolt, Stirrup.—The same as "bridge and bolt," "yoke," and "dog," q. v.

Bolt, Stud.—A bolt threaded at each end, so that it can be screwed into a fixed piece at one end and have a nut screwed on at the other. See Bolt, Fig. 3.

Bolt, T.—A bolt with a rectangular head, forming a T.



Bolt, Tire.—A bolt provided with a rounded head and a wing-nut for securing the casing of a pneumatic tire to the wheel-rim. See Chaplet.

Bolz, F. R.—Treas. Bay State Auto Co., 112 Norway St., Boston, Mass.

Bolz, Julius.—Pres. Bay State Auto Co., 112 Norway St., Boston, Mass.

Bombort, H. E.—Designer and Supt.

Bellefontaine Automobile Co., Bellefontaine, O.

Bomeister, Carl.—Sec. and Treas. Diezemann Shock Absorber Co., 1311-13 Hudston St., Hoboken, N. J.

Bond Bros. Co.—Motor Mart, Boston, Mass. (Iroquois, Deere.)

Bond, Geo. R.—Treas. H. D. Smith & Co., Plantsville, Conn.

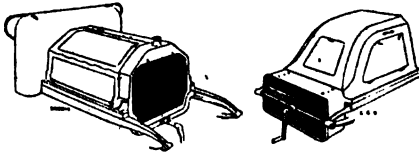
Bond, R. B.—Jessups, Md. (Cadillac.)

Bondin et Cie.—23 place du Chatelain, Brussels, Belgium. Mfrs. acetylene lamps.

Bon Marché, Grands Magazins du.—Rue de Sevrès, Paris, France. Mfrs. wearing apparel. (Coats.)

Bonnardi, Luigi.—Via Piazza, 3 Crocetta, Turin, Italy. Mfrs. motorcycles.

Bonnet.—The case or cover, occasionally called a "hood," placed over the engine of a motor-car or motor-boat. Bonnets, which are usually of sheet steel and of various sizes, according to the number of cylinders to be covered, and of different forms, according to the fancy of the designer, are sometimes provided with parallel slots to per-



mit of a free play of air around the motor in order to aid in cooling, and usually have hinged doors at the sides to permit of inspection of the parts of the motor. (2) A term sometimes applied to the steel or aluminum "pan" which protects the under part of the power-plant of a motor-car. (3) In mechanics, any case or covering. See Hood.

Bonnet.—4 Rue de la Bastille, Paris, France. Mfrs. marine motors.

Bonnet et Zecht.—14 rue de la Vega, Paris, France. Mfrs. Peerless motorcycles.

Bonney Motor Car Co.—1112 Locust St., Kansas City, Mo. (Jewel, Wayne.)

Bonney, V. A.—Lamb Auto Co., 207-9 6th Ave., Clinton, Iowa.

Bonsfield, C. J.—818 Fairagut St., Bay City, Mich. (Packard.) Garage.

Book, J. B.—Vice-Pres. and Director Wayne Automobile Co., cor. Piquette and Brush Sts., Detroit, Mich.

Boone, R.—Sales Mgr. Electrical & Mechanical Development Co., Asbury Park, N. J.

Boot.—An enameled-duck or leather casing for protecting bearings on the cross-rods where they join knuckle arms at the wheels. (2) A similar protection for a universal joint on shaft-driven cars.

(3) A receptacle behind a car for carrying luggage, parcels, etc.

Booth, N. E.—743-45 39th St., Brooklyn, N. Y. Mfrs. felt packings, dust rings and gaskets for automobiles, axles, etc. Est. 1904.

Bootjer, G. M.—Cumberland, Iowa. Garage

Borax.—A chemical compound resulting from the combination of boracic acid and soda ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$). It is used as a flux in the operations of brazing and soldering, as is also boracic acid (BO_2H_3), from which it is formed. When mixed with shellac in the proportion of one part to five, borax renders that resin soluble in water, and forms with it a species of varnish, and also a good cement.

Borbein Auto Co.—2109-11 N. 9th St., St. Louis, Mo. Mfrs. and jobbers, running gears, bodies, wheels, axles, steering devices, complete chassis. Cap. \$10,000. Est. 1900. H. F. Borbein, Pres. and Mgr.; W. L. Johnson, Vice-Pres. and Sec.; Chas. Borbein, Treas.

Borbein, Chas.—Treas. Borbein Auto Co., 2109-11 N. 9th St., St. Louis, Mo.

Borbein, H. F.—Pres. and Mgr. Borbein Auto Co., 2109-11 N. 9th St., St. Louis, Mo.

Borchers, Dr.—Walstrasse 43, Berlin, Germany. Mfrs. elastic wheels.

Borchers Tonneau M'fg. Co.—Dayton, Ohio. Mfrs. wood and metallic bodies.

Borden, Harry E.—Mgr. David L. Parker & Co., 18 Market St., New Bedford, Mass.

Borderel.—135 rue de Cliguancourt, Paris, France. Mfrs. automobiles, gas. (Cail Borderel cars.)

Borderwisch & Glancy Auto Co.—12 N. Jefferson St., Dayton, O. (Ford, Queen.)

Bore.—The internal diameter of a motor-cylinder. The distance traveled by the piston is called its "stroke." The bore, stroke, and number of revolutions of the motor per minute give approximately its power. See Piston-stroke.

Borechansky.—26 rue Garnier, Neuilly, France. Mfrs. radiators.

Boru, C. Christian.—Pres. The Barndt-Johnston Auto Supply Co., 426 Donaldson St., Columbus, O.

Born, Henry.—Foreman J. E. Loneragan & Co., 211-215 Race St., Philadelphia, Pa.

Borne-Scrymser Co.—Claremont, N. J. Mfrs. Grease, oils, semi-solid oils.

Borough Automobile Co.—12 New York Ave. and 185 Herkimer St., Brooklyn, N. Y. Garage.

Borrisch, Emil.—Supt. Johnson Service Co., Michigan and Jefferson Sts., Milwaukee, Wis.

Bosch, Robert.—1945 Broadway, New York City. Mfrs. and importers mag-

netos and ignition dynamos, spark plugs, wire terminals.

Bosch, Robert.—Stuttgart, Germany. Mfrs. high tension magnetos.

Boss.—A cylindrical mass of metal forming part of a machine; the solid center of a pulley or wheel through which the shaft passes; the enlarged part of a shaft on which a wheel or the blades of a propeller are mounted; or any enlarged part of the diameter, as the end of a separate piece in a line of shafts connected by couplings.

Boss, J. G.—Sec. Chicago Vulcanizing Co., 1461-63 Michigan Ave., Chicago, Ill.

Boss Knitting Machine Works.—Reading, Pa. Mfrs. automobiles, steam.

Bossett, E. G.—146 Main St., Bristol, Conn. Garage.

Bossineau, N.—Head of Polishing Dept. Jos. N. Smith & Co., Fourth and Porter Sts., Detroit, Mich.

Boston Artificial Leather Co.—12 E. 18th St., New York City. Mfrs. artificial leather.

Boston Auto Gauge Co.—613 Old South Bldg., Boston, Mass. Mfrs. gasoline tank gauges.

Boston Auto School.—343 Tremont St., Boston, Mass. Automobile instruction.

Boston Automobile Dealers Association, Inc.—5 Park Sq., Boston, Mass. Object: "Mutual interest." Organized, 1902. Charter members: J. H. MacAlman, George H. Lowe, Chester I. Campbell, W. E. Eldridge, Harry Fosdick, A. P. Underhill, S. K. Dingle, K. A. Skinner, F. E. Randall, Benjamin Smith. Officers: Pres., J. H. MacAlman; Vice-Pres., Geo. H. Lowe; Treas., Harry Fosdick; Sec., Chester I. Campbell. J. H. MacAlman, Chairman of Comm. Former Presidents, K. A. Skinner and J. H. MacAlman. Has promoted six annual Boston Automobile Shows.

Boston Automobile Exchange.—177 Berkeley St., Boston, Mass. (Jackson, Monarch, Logan.) Mfrs. fuel pumps.

Boston Belting Co.—90 Pearl St., Buffalo, N. Y. Mfrs. belting.

Boston Gear Works.—Hayward St., Norfolk Downs, Mass. Mfrs. spur, bevel, spiral, worm gears, sprockets, etc. Est. 1889. Frank Burgess owner and proprietor.

Boston Insurance Co.—Boston, Mass. Automobile insurance, fire and theft.

Boston Mat & Basket Co.—62 Fulton St., Boston, Mass. Mfrs. hampers.

Boston Motor Co.—43 Columbus Ave., Boston, Mass. (Acme, Pungs-Finch.)

Boston Pressed Metal Co.—171-73 Union St., Worcester, Mass. Mfrs. ball retainers, brake bands, cups and cones, drop forgings, hub caps, hub flanges, pressed steel products, metal stampings.

Boston Steam Specialty Co.—170

Congress St. Mfrs. dealers and jobbers, needle valves, carbureters, priming cups, air cocks, cylinder cocks, brass fittings, steel fittings. Cap. \$50,000. Est. 1895. John A. Emery, Treas.; F. H. Plooff, Pres.; Wm. Bell, Vice-Pres.

Boston Tire Tread Co.—45 Stanhope St., Boston, Mass. Mfrs. tire treads.

Boston Varnish Co.—Everett Sta., Boston, Mass. Mfrs. varnishes.

Boston Woven Hose & Rubber Co.—29 Hampshire St., Cambridge, Mass. Mfrs. rubber mats, packing, tire tape, rubber tubing.

Boswell & Co.—25 No. Franklin St., Wilkesbarre, Pa. (Jackson.)

Boswell, Geo. C.—Broad St., Danielson, Conn. Garage.

Bothner Hardwood Moulding Co.—1945 Park Ave., New York City. Mfrs. wood panels, wood moulding, wood trimmings.

Botiaux et Cie.—28 rue Greffuhle, Levallois-Perret, Seine, France. Mfrs. bodies.

Bott Bros. Mfg. Co., The.—166 N. High St., Columbus, O. Mfrs. metal polishes.

Botterill, Tom.—1643 California St., Denver, Col., and Salt Lake City, Utah. (Pierce Arrow.)

Botto, W. H.—Gen. Sales Mgr. Palmer & Singer Mfg. Co., 1620-24 Broadway, New York City.

Boucher, J. J.—Designer and Supt. Monarch Motor Car Co., Chicago Heights, Ill.

Boudreaux, L.—8 rue Hautefeuille, Paris, France. Mfrs. marine motors.

Buggy, Clifford M.—Pres. Daimler Mfg. Co., 939 Steinway Ave., Long Island City, N. Y.

Boughey, F. M.—Sec. and Auditor, Fairbanks Morse & Co., Franklin and Monroe Sts., Chicago, Ill.

Bougie Vale.—97 Rue St. Lazare, Paris, France. Mfrs. spark plugs.

Bougie Westland.—9 Rue Théophile-Gautier, Neuilly-sur-Seine, France. Mfrs. spark plugs.

Bouillett, Léon.—St. Cheron, Seine-et-Oise, France. Mfrs. acetylene lamps.

Boulanger, J.—Revigny, Meuse, France. Mfrs. metallic wheels.

Boulevard Auto Co.—Fellsway, East Somerville, Mass. Garage.

Boulevard Auto Garage.—204 Lincoln Park Blvd., Chicago, Ill. Garage.

Boulevard Automobile Garage.—2975 Boulevard, Jersey City, N. J. Garage.

Boulevard Auto Station.—Pawtucketville, Mass. Garage.

Boulevard Garage Co.—Superior Ave. and Boulevard, Cleveland, O. (Queen.)

Bourdeaux, L.—16th Ave., Gramont, Tours, France. Mfrs. motorcycles.

Bourdereaux's Automobile Garage.—629 Main St., Peoria, Ill. Garage.

Bourdier-Villeve.—100 rue Bannier, Orleans, France. Mfrs. elastic wheels.

Bourdon, Edouard.—74 Faubourg du Temple, Paris, France. Mfrs. gauges.

Bourn Rubber Co.—Providence, R. I. Mfrs. insulated wire.

Bourquin, Veuve, Ferdinand.—10 cite Trévis, Paris, France. Mfrs. speed indicators

Bousfield, C. J.—Bay City, Mich. (Packard.)

Bouton, George Thadée.—36 Quai National, Puteaux (Seine). Born at Paris. 1847. Chevalier of the Legion of Honor. Copartner in the house of de Dion, Bouton and Company. He was a laborer



from 1865 to 1880, and then set up a small shop in which he engaged in mechanical work of precision, especially the manufacture of scientific apparatus for MM. Ducretet, Bourbouze and others. In 1882 he formed a partnership with

Count de Dion for the construction of a steam tricycle. He has been associated with Count de Dion since 1883, and, with him, created the first gasoline tricycles, which formed the basis of the great success with which the firm of de Dion-Bouton has met

Bouton, M. D.—Pres. Bryant Motor Co., 110 W. 41st St. and 1675 Broadway, New York City.

Bouvier fils.—51 rue du Tunnel, Valence, Drôme, France. Mfrs. non-skid bands.

Bow.—The curving fore part of a vessel

Bow.—One of several bent tubes or strips of wood that support the hood of a vehicle.

Bowe & Son, A.—231 W. Main St., Meriden, Conn. (Reo, Premier.)

Bowden, E. M., Patents Syndicate Ltd.—Baldiwin's Gardens, Gray's Inn road, London, E. C., England Mfrs. steering gears.

Bowden, Ltd. Syndicat Français des Brevets.—12 Ave. de la Grand Armée, Paris, France. Mfrs. horns, exhaust horns.

Bowen & Odery Mfg. Co.—Pomerooy St., New Cross, London, E., England. Mfrs. storage batteries.

Bowen, Geo. W.—Proprietor Bowen Mfg. Co., Canal St., Auburn, N. Y.

Bowen, Lem. W.—Pres. Cadillac Motor Car Co., 1343 Cass Ave., Detroit, Mich

Bowen Mfg. Co.—Canal St., Auburn, N. Y. Mfrs. self-closing and dust-proof oil cups or oil covers; plain compression grease cups, marine grease cups and ratchet compression grease cups, leather washers, felt washers, strips and shapes. Est. 1894. Geo. W. Bowen, Sole Prop.; Chas. A. P. Pace, Adv. Mgr. and Purchasing Agt.; Geo. W. Severson, Sales Mgr

Bowen Motor Co.—419 Auburn Ave., Buffalo, N. Y. Mfrs. gasoline automobile motors.

Bowen, Otis.—Supt. G. A. Hosmer Co., 601-7 Northland Ave., Buffalo, N. Y.

Bower Auto Co.—2120 N. Nevada Ave., Colorado Springs, Col. (Cadillac.)

Bowers Co., The F. E., Inc.—307 First National Bank Bldg., New Haven, Conn. Factory, Middletown, Conn. Mfrs. carburetters. Cap., \$10,000. Est. 1907. H. P. Warren, Pres.; E. B. Spalding, Sec.; C. G. Spalding, Treas.; F. E. Bowers, Gen. Mgr.

Bowers, F. E.—Gen. Mgr. The F. E. Bowers Co., Inc.; Pres. Gilbert Mfg. Co., New Haven, Conn.

Bowers Metal Stamping Co.—718 E. 11th St., New York City. Mfrs. curtain fasteners, machinery springs.

Bowers, T. G.—Sec. and Treas. Gilbert Mfg. Co., New Haven, Conn.

Bowers, W. P.—Sec. and Treas. Luster Chemical Co., 1303 Michigan Ave., Chicago, Ill

Bowes, J. T.—Foreman J. E. Lonergan & Co., 211-215 Race St., Philadelphia, Pa.

Bowman & Barrett Auto Co.—Minneapolis, Minn. (Monarch.)

Bowman Automobile Co., Sidney B.—225-231 West 49th St., New York City. Importers Clement-Bayard Agts. Aperson. Sidney B. Bowman, Pres., Richard T. Greene, Treas. Garage, 200 cars. Repairing.

Bowman, Sidney B.—Pres. Sidney B. Bowman Automobile Co., 225-231 W. 49th St., New York City.

Bown, C. E.—309 W. Federal St., Youngstown, Ohio. (Ford.) Est. 1899 (Bicycles and repairs since 1894). Garage, 3 cars. Repair shop at 1929 Wick Ave.

Bown Machine Works.—Battle Creek, Mich. Mfrs. grease cups, special automobile machinery, tools.

Bowser & Co., S. F.—Ft. Wayne, Ind Mfrs. tanks, storage tanks.

Bowser & Co., S. F.—540 Front St., Toronto, Canada. Garage.

Box.—A term used interchangeably with "case" for the box in which gears are enclosed.

Box-nut.—See Nut, Box.

Box-spanner.—See Spanner, Box.

Box, Stuffing.—A box containing packing for forming a tight joint around a

revolving or sliding part, or around a piston-rod.

Boyd Automobile Co.—415 Massachusetts Ave., Indianapolis, Ind. (Buick, Waltham, Stevens-Duryea.)

Boyd, James—73 39th St., Brooklyn, N. Y. Mfr. tanks.

Boyd, Lewis—Supt. Ellwood Ivins' Tube Works, Oak Lane Station, Philadelphia, Pa.

Boyer Motor Car Co.—408 Golden Gate Ave., San Francisco, Cal. (Royal, Franklin.)

Boyer, Noé—4 rue de Paris, Puteaux, Seine, France. Mfrs. automobiles, gas. (Boyer cars.)

Boyer, Radford & Gordon Tank & Pump Co.—Dayton, Ohio. Mfrs. tanks, storage tanks.

Boyle & Co., John—112-114 Duane St., New York City. Mfrs. license numbers, tool bags, auto trunks.

Boyle, John A.—Vice-Pres. Brush Runabout Co., 14-16 Baltimore Ave., W., Detroit, Mich.

Boyles, Geo.—425 E. Main St., Kalamazoo, Mich. (Ford.)

Boynton & Plummer—Worcester, Mass. Mfrs. forge equipment.

Boynton, F. R.—Supt. American Locomotive Automobile Co., Providence, R. I.

Boynton's Improved Pioneer Oil Clothing Co.—Vincent St., Gloucester, Mass. Mfrs. miscellaneous wearing apparel.

Bozier—7 rue Denis-Papin, Puteaux, France. Mfrs. transmission, and different gears, automobile motors, clutches.

Braasct, Wm.—Sheboygan, Wis. (Waltham.)



Brace—A cranked instrument used for holding and rotating drills or similar tools.

Bracket—A projecting piece designed as a support for some object, such as a lamp, strut, brake-operating mechanism, etc.

Brackett, M. E.—Pres. Coppock Motor Car Co., Decatur, Ind.

Bradawl—A small instrument useful for forming holes in wood, leather, etc. Several sizes should be carried in the tool-box of a motor-car.

Bradbury & Co. Ltd.—Wellington Works, Oldham, England. Mfrs. motorcycles.

Braddock, F. W.—Head of Manufacturing Dept., Helios, Mfg. Co., Bridgetown, Philadelphia, Pa.

Bradford Co.—711 Market St., Wilmington, Del. (Reo.)

Bradford Motor Co.—Bradford, Pa. Mfrs. motorcycles.

Bradford Motor Works—Bradford, Pa. Mfrs. carburetters.

Bradford, P. S.—9 Liberty St., Newburyport, Mass. Garage.

Bradley, George James—B. August 23, 1878, at Oswego, N. Y. Educated at common and high schools of Chicago. Present occupation, Mgr. Cleveland Branch, The Diamond Rubber Co. Member of Pittsburg and Cleveland Automobile Clubs. Res. 600 Prospect St. Office 1514 Euclid Ave., Cleveland, Ohio. Has been connected with automobile trade since 1900.

Bradley, Jerome—Treas. and Director Willyoung Appliance Co.—Ludlow Station, Yonkers, N. Y.

Bradley Motor Co., C. E.—268 Diamond St., Philadelphia, Pa. Mfrs. motorcycles.

Bradley Motor Patents, Ltd.—165 Fenchurch St., London, E. C., England. Mfrs. automobile motors.

Bradley, S. L.—809-811 N. Main St., Princeton, Ill. (Reo, Ford.) Est. 1886. (commenced selling automobiles 1901). Garage, 50 cars. Repairing.

Bradley, W. F.—Editorial Dept., The Automobile, Flatiron Bldg., New York City.

Bradly Co., David—Fond du Lac, Wis. (Rambler.)

Brady, A. C.—32 W. 33rd St., New York City. Garage.

Brady Auto Co., J. H.—234 Jefferson Ave., Detroit, Mich. (Peerless, Pope-Hartford.)

Brady, J. J.—Second Vice-Pres. and Factory Mgr. E. R. Thomas Detroit Co., 2704-18 Jefferson Ave., Detroit, Mich.

Brady, L.—Officer, Croftan Storage Battery Co. 423-425 W. Queen St., Toronto, Canada.

Braeburn Steel Co.—Braeburn, Pa. Mfrs. bar iron and steel.

Bragg, Dr. F. A.—Treas. American Coil Co. Inc., cor. Wall and Cocal-st Sts., Foxboro, Mass.

Briansby & Sons—125 Long Acre, London W. C., England. Mfrs. bodies.

Brake—A mechanism for slowing down or stopping a vehicle, and which usually acts on a disk, drum or wheel. A block made to fit the periphery is forced into close contact therewith by levers or screws, or a flexible band is pulled into frictional contact with the external or internal surface of a drum.

The brakes employed on motor vehicles may be divided into three classes: Hub or rear-wheel, transmission and differential-gear brakes. The forms in use are single or double-acting, foot or hand-operated, and of the external or contracting band and internal or expanding-band types.

Brake, Band.—A brake which operates by tightening a leather-faced steel band or strap around a drum (Fig. 1), either

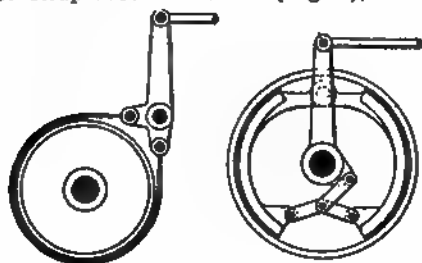


Fig. 1

Fig. 2

on the hub of the wheel or on the case of the differential gear, or by tightening a similar strap or band against the internal surface of a rotating drum or pulley (Fig. 2).

Brake-block.—The piece that forms the backing of a brake-shoe.

Brake, Compensating.—A brake which is applied simultaneously at two or more points, but so arranged that the braking power shall be equal at all points.

Brake, Constricting.—The same as "band-brake." q. v.

Brake, Drop.—A device called also a "sprag," to prevent accidents in hill-climbing. It is attached to the rear axle and lowered on the approach of an incline. See Sprag.

Brake-drum.—That part of the brake upon which the brake-shoe or band binds.

Brake, Drum.—See Brake, Band.

Brake, Expanding.—A drum-brake in which a strap of metal faced with leather, fiber or other suitable substance acts against the internal surface of a rotating drum. See Brake, Band.

Brake, Friction.—See Dynamometer.

Brake Horse-power.—The actual horse-power which is developed by a motor, and is absorbed by a brake dynamometer. It is distinguished from the "indicated" horse-power as being the amount of power which a motor can put out for useful purposes. See Dynamometer and Power, Horse.

Brake, Hub.—A brake applied to a drum at the hub of a wheel.

Brake, Prony's.—See Dynamometer.

Brake, Ribbon.—The same as band-brake. See Brake, Band.

Brake, Shoe.—A brake which operates by the pressure of the contact surface or shoe upon the periphery of the wheel-tire. As this form of brake proves detrimental to the tire, and, moreover, does not hold well on wet rubber, it has been practically abandoned.

Brake-shoe.—A flexible part of the brake, called also a brake-band; or that portion of a brake-block which comes into frictional contact with the disk, drum or other surface on which the brake acts.

Brake, Spoon.—A tire-brake provided

with a spoon-like shoe which is made to bear against the surface of the rubber tire.

Brake, Tire.—A brake which is applied against the surface of a tire.

Brake, Transmission.—A brake placed either on the jack-shaft of a double-chain car, or immediately behind the transmission of a shaft-driven one, or on a drum attached to the driving-sprocket of a single-chain driven planetary transmission car.

Braley, A. H.—400 S. Spring St., Los Angeles, Cal. (Stearns.)

Braley, E. B. R.—Pasadena, Cal. (Maxwell. Pope Waverly.)

Brampton Bros., Ltd.—Calais, France. Mfrs. chains.

Brampton Bros., Ltd.—Oliver St., Chester St., Birmingham, England. Mfrs. chains.

Branch, H. P.—St. Cloud, Minn. (Buick.)

Brandegge Automobile Co.—625 State St., Bridgeport, Conn. (Stevens-Duryea.)

Brandenburg & Co.—85 Lake St., Chicago, Ill., and 103 Reade St., New York City. Sellings agts.; Thor motorcycles.

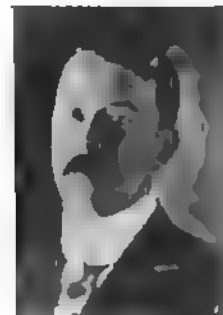


Photo by Spencer & Wells

Brand, Fred Perkins.—B. Sept. 22, 1874, at Utica, N. Y. Present occupation, Vice-President, Pur. Agt., Sales and Advt. Mgr. and Director in The Imperial Motor Car Co., Williamsport, Pa. Member Chicago and Buffalo Automobile Clubs and Quaker City Motor Club. Connected with the automobile trade since 1898. Owned first car in 1899. Residence and office address, Williamsport, Pa.

Brandia, Chas. W.—Pres. and Advt. Mgr. Lovejoy Novelty Works, Laramie, Wyo.

Brandow Combination Lock Switch Co.—86 North St., Pittsfield, Mass. Mfrs. electric lock switches.

Brann, E.—1225 Park Ave., New York City. Mfrs. miscellaneous wearing apparel.

Branson, Kent & Co., Ltd.—40 Great Eastern St., London, E. C., England. Mfrs. horns.

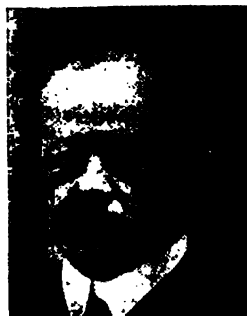
Branstetter, H. P.—Pres. Branstetter Motor Co., 1337 Michigan Ave., Chicago, Ill.

Branstetter Motor Co.—1337 Michigan Ave., Chicago, Ill. (Dragon, Moon.) Est. 1905. Cap. \$2,500. Pres. H. P. Branstetter.

Brant, Frank S.—Vice-Pres. Light Mfg. & Foundry Co., 509 Queen St., Pottstown, Pa.

Braschi, H. T.—Mexico City, Mexico. (Rainier.)

Brasier, Henri Charles.—36 rue Molitor, Paris. Born at Ivry-la-Bataille (Eure), March 9, 1864. Chevalier of the Legion of Honor. Manager of the industrial part of the "Trèfle a Quatre Feuilles" Society. Entered the school



of Chalons in 1880; draughtsman to the Orleans Company in 1884, in the material and traction service; and member of the Mors establishment from 1886 to 1891, in which he occupied himself with the construction of the

first steam-carriage heated with gasoline, and also with the construction of steam-boats. In 1896 he manufactured some gasoline cars and the first 4-cylinder V-shaped motors. In the Tour de France with Levegh: Paris-Saint-Malo; Paris-Toulouse; Paris-Bordeaux (1901); Paris-Berlin (Class 4).

On November 1, 1901, he entered the Société des Anciens Etablissements Georges Richard as technical manager. M. Brasier restored the Bennett Cup to France in 1904, and, by his victories, preserved it in 1905.

Brasier, Société des Automobiles.—Ivry, Seine, Paris, France. Mfrs. automobiles, gas. (Brasier cars.)

Brass.—An alloy of from 63 to 72 parts of copper with from 27 to 34 of zinc. It is of a yellow color, and hard, but so ductile that it can be drawn out into fine wire. Brass is tougher and more flexible than copper, and does not tarnish so quickly. It is used for many parts of machinery where small and somewhat intricate castings are required, or where a certain degree of finish is desired for the sake of appearance, and especially as bearings for moving parts (such as shafts) of iron or steel. Red brass is composed of 11 parts of copper to 1 part of zinc; orange brass of 98.93 parts of copper and 0.73 of a part of zinc; and white brass of 34 parts of copper and 66 of zinc. (3) Brass is sometimes used as a synonym for gun-metal (q.v.). (3) Brass is a designation also for a bearing-box or a bush made of an alloy of copper and tin.

Brass, Aluminum.—An alloy of aluminum, copper and zinc.

Brassard, Joseph.—119 Lincoln St., Central Falls, R. I. Garage.

Braswell, O. E.—Rowland, N. C. Repairing.

Bratt, Ande.—1548 Broadway, Denver, Col. Repairing.

Brattleboro Automobile Co.—Brattleboro, Vt.

Braunschweiger Gummi-Export.—Braunschweig, Germany. Mfrs. pneumatic rubber tires, motor cycles.

Braunsdorf, Geo. W.—309 E. 43d St., New York City. Mfr. felt washers.

Bravo, Oscar F.—Mayaguez, Porto Rico. (Oldsmobile.)

Brawn, W. F.—Pres. Baldwin Chain & Mfg. Co., 199 Chandler St., Worcester, Mass.

Brazier Auto Works.—38th and Market Sts., Philadelphia, Pa. (Marmon.) Est. 1900. H. Bartol Brazier, Prop.; Joseph A. Hudson, Mgr. Garage, 30 cars. Repairing.

Brazier, H. Bartol.—Prop. Brazier Auto Works, 38th and Market Sts., Philadelphia, Pa.

Brazil Automobile Garage.—Main St., Brazil, Ind. Garage.

Brazing.—The uniting of two surfaces or edges of metals, such as iron, steel and brass by means of brass-solder. The joints are cleaned and covered with borax, and then some of the solder is placed over the joint and heated until it runs in; after which it is allowed to harden and any superfluous metal cleaned off. Brazing is much stronger than soldering and is applicable in many more cases.

Breads, F. A.—328 E. Water St., Syracuse, N. Y. Garage.

Break.—An open carriage having in front a seat which is some times higher than the one back of it, and two long parallel seats facing each other in the rear of these. The vehicle is entered from the back. When enclosed it forms an omnibus.

Break-contact, Friction.—See Ignition.

Breast-hooks.—Thick pieces of timber incurred in the form of knees and used to strengthen the fore part of a boat.

Breckenridge, E. P.—Sec., Treas. and Gen. Mgr. Toledo Storage Battery Co., 102 Oliver St., Toledo, O.

Breech-piece.—The detachable end of a cylinder or other similar piece.

Breeches-pipe.—A term sometimes applied to the inlet-pipe of a gas-motor, from its forked shape, somewhat resembling that of a pair of breeches (French "culotte"). See Manifold.

Breed, E. S.—40 Columbus Ave., Boston, Mass. Garage.

Breeze Carburetor Co.—Successor to Breeze Motor Mfg. Co., 276 Halsey St., Newark, N. J. Mfrs. carbureters, fuel strainers, muffler cutouts, nipples, coup-

lings, brass and iron castings, etc. Cap. \$50,000. Est. Jan. 31, 1907. George A. Breeze, Pres.; Colman S. O'Laughlin, Sec. and Treas. Directors, G. H. Breeze, C. S. O'Laughlin, Ira S. Heller, R. S. O'Laughlin, M. R. O'Laughlin. Foreman of Fractory, Frank Banner. Selling Agts., Breeze Carburetor of New York, New York City.

Breeze Carburetor Company of New York.—101 W. 66th St., New York City. Sole selling agents Breeze Automatic Carburetor, gasoline separators, muffler cutouts, nippers, couplings, brass and iron castings, etc. Cap. \$5,000. Est. April, 1907. Harry A. Robinson, Pres.; A. M. Reynaud, Sec.; I. J. Reynaud, Treas. and Gen. Mgr.; Harry A. Robinson, Chief Engineer.

Breeze, Geo. A.—Pres. and Director The Breeze Carburetor Co., 276 Halsey St., Newark, N. J.

Breger et Neveux.—50 rue des Marais, Paris, France. Mfrs. ball bearings.

Bréguet.—22 ave. de la Grande Armée, Paris, France. Mfrs. low tension magnetos.

Brehman A.—Sec. Northwestern Motor Car Co., 1928-1930 N. 20th St., Philadelphia, Pa.

Bremer, L. A.—25 Washington St., Gloversville, N. Y. Garage.

Brennan Mfg. Co.—Syracuse, N. Y. Mfrs. vaporizers.

Brennan Motor Co.—Syracuse, N. Y. Mfrs. gasoline automobile motors, gasoline marine motors, circulating pumps.

Brennan, Wm.—Church St., Seabright, N. J. Est. May, 1906. Garage, 25 cars. Repairing.

Bressler & Son, I. N.—408 E. 3rd St., Sterling, Ill. Partnership, I. N. Bressler and H. J. Bressler. Est. 1881. Not inc. H. J. Bressler head of automobile and motorcycle departments. Garage, 4 cars. Repairing. Mfrs. the Heaton motorcycle.

Bressler, H. J.—Partner and Gen. Mgr. I. N. Bressler & Son, 408 E. 3rd St., Sterling, Ill.

Bressler, I. N.—Partner I. N. Bressler & Son, 408 3rd St., Sterling, Ill.

Bretz Co., J. S.—Times Bldg., New York City. Selling agent and importer, magnetos, steering apparatus, ball bearings, universal joints.

Brewer, Elias.—42 Sudbury St., Boston, Mass. Mfrs. elevators for garages.

Brewer, F. F.—Purch. Agt. Chase Motor Truck Co., Syracuse, N. Y.

Brewer, W. W.—2787 6th Ave., Troy, N. Y. Garage.

Brewster & Co.—47th and Broadway, New York City. (Acme, Renault.) Mfrs. bodies.

Breyfogle, J. W.—Vice-Pres., Treas. and Designer, Gearless Transmission Co., Rochester, N. Y.

Bridge.—A horse-shoe shaped casting or forging. E (see figure), sometimes called a "dog" and "yoke," provided with



a threaded hole in the center for the reception of a T or other bolt, V; called also a "bridge and bolt," and, when there are three arms, a "crowfoot." (2) On French cars, a tube (housing), of wide diameter,

which encloses and supports the live axle; or a similar tube which supports the differential and change-speed case on a double chain-driven car. Rear-bridge (Pont arrière) is a name given by the French to the housing of the rear axle of a single chain or shaft-driven car.

Bridgeport Automobile Co.—388 Fairfield Ave., Bridgeport, Conn. (Pope-Hartford, Pope-Toledo, Baker.)

Bridgeport Brass Co.—Bridgeport, Conn. Mfrs. bellis, brass and copper sheets and rods, acetylene generators, brass and copper metals, fuel and air pumps, brass and copper tubing.

Bridgeport Coach Lace Co.—805 Wood Ave., Bridgeport, Conn. Mfrs. cloth and carpet trimmings.

Bridgeport Crucible Co.—Bridgeport, Conn. Mfrs. crucibles.

Bridgeport Cycle Co.—Bridgeport, Conn. (Indian.)

Bridgeport Deoxidized Bronze & Metal Co.—Bridgeport, Conn. Mfrs. aluminum, brass, bronze and copper castings, automobile gear cases, bronze metals.

Bridgeport Electric Plating Co.—Bridgeport, Conn. Mfrs. wrought iron and steel pipe, galvanizing.

Bridgeport Hardware Mfg. Co.—461-469 Iraniston Ave., Bridgeport, Conn. Mfrs. screw drivers, plyers, wire cutters, hack saws, etc. Cap. \$125,000. Est. 1892. W. F. Hobbs, Pres.; Harry B. Curtis, Sec. and Treas.

Bridgeport Malleable Iron Co.—Bridgeport, Conn. Mfrs. gray iron castings, malleable iron castings.

Bridgeport Motor Co.—Bridgeport, Conn. Mfrs. gasoline marine motors.

Bridgeport Vehicle Co.—South Ave. and Water St., Bridgeport, Conn. Mfrs., dealers and jobbers, automobile bodies (wood and metal), tops, slip covers, tool boxes, wind shields, lamp covers, fenders, hoods. Harry D. Miller, Pres. and Treas.; H. F. Brandes, Vice Pres.; Geo. C. Miller, Sec. Cap. \$50,000. Est. March 1, 1906.

Bridle.—The loop by which a slide-valve is connected to the valve-rod.

Briest.—119 rue de Rennes, Nantes, France. Mfrs. auto lamps and carburetors.

Briet et Cie, M.—7 rue Magenta. Pureaux, France. Mfrs. lubricators.

Briggs & Wade.—Sagamore St., Lynn., Mass. Mfrs. gasoline and alcohol motors for automobiles and motorboats. (2 stroke type.)

Briggs Carriage Co.—Amesbury, Mass. Mfrs. tops, wood and metallic bodies.

Briggs, E. C.—127 E. Jefferson St., South Bend, Ind. (Franklin.)

Briggs, W. H.—424 Bedford Ave., Brooklyn, N. Y. Mfrs. wire terminals.

Brigham & Saunders.—Commonwealth Ave. and Malvern Sts., Brighton, Mass. Garage.

Bright, Fred E.—Vice-Pres. and Treas. Hess-Bright Mfg. Co., 19th and Hamilton Sts., Philadelphia, Pa.

Brighton Garage.—58 Murdock St., Brighton, Mass. Garage.

Brignall, Geo.—5110 Calumet Ave., Chicago, Ill. Garage.

Brill Engine Works.—Appleton, Wis. Mfrs. gasoline marine motors.

Brillé, Automobiles, Eugene.—Havre, France. Mfrs. automobile motors, automobiles, gas. (Eugene Brillé.)

Brimstone.—See Sulphur.

Brinckmann Bros.—716 Franklin St., Michigan City, Ind. Garage.

Brinegar, E. P.—Pres. Pioneer Auto Co., 901-925 Golden Gate Ave., San Francisco, Cal.

Brinkmeyer, J. H.—Pres. and Head of Machine Shop, Pioneer Brass Works, 418-424 S. Penna St., Indianapolis, Ind.

Briquet et de Ract.—13 rue de Manchester, Brussels, Belgium. Mfrs. radiators.

Briscoe, Benjamin.—B. May 24, 1869, at Detroit, Mich. Educated at Detroit common and high schools. Present occupation, Pres. and Gen. Mgr. Maxwell-Briscoe Motor Co. Director in the following companies: Maxwell-Briscoe Motor Co., Tarrytown, N. Y.; Briscoe Mfg. Co., Detroit, Mich.; Maxwell-Briscoe, Inc., New York City; Maxwell-Briscoe - Boston Co., Boston, Mass.; Maxwell-



Briscoe McLeod Co., Detroit, Mich.; Maxwell-Briscoe-Chase Co., Chicago, Ill.; Maxwell-Briscoe-Wilcox Co., Los Angeles, Cal.; New Castle St. R. R. Co. and New Castle Realty Co., New Castle, Ind.; Willyoung Appliance Co., Yonkers, N. Y. Member of Auto Club of America, Westchester Motor Club. Pres. American Motor Car Manufacturers' Association. Res. Croton Ave., Tarrytown, N.

Y. Office address, Tarrytown, N. Y. Owned first automobile in 1903. Has been connected with automobile trade since 1902. Recreations; automobiling, fishing.

Briscoe, Frank.—Gen. Mgr. Brush Runabout Co., 14-16 Baltimore Ave., W., Detroit, Mich.

Briscoe Mfg. Co.—Detroit, Mich. and Newark, N. J. Mfrs. tool boxes, waste cans, dashes and fenders, hoods, mufflers, radiators, brass and copper tubing, tanks.

Bristol, A.—Treas. Schubert Bros. Gear Co., 42-44 Celar St., Oneida, N. Y.

Bristol Automobile Co.—Naugatuck Rd., Waterbury, Conn. (Thomas Flyer, Thomas Detroit.) Est. 1906. Cap. \$10,000. Edgar H. Bristol, Pres.; Bennett B. Bristol, Sec.; Watson E. Goodyear, Treas.; Frank C. Goodyear, Mgr. Garage, 25 cars. Repairing.

Bristol, Bennet B.—Sec. Bristol Automobile Co., Naugatuck Rd., Waterbury, Conn.

Bristol, Edger H.—Pres. Bristol Automobile Co., Naugatuck Rd., Waterbury, Conn.

Bristol Motor Car Co.—N. Main St., Attleboro, Mass. (Rambler, Cameron.)

Bristol Wagon and Carriage Works.—Bristol, England. Mfrs. automobiles, steam comm.

Bristow, Frederick.—Treas. Weston Electrical Instrument Co., Waverly Park, Newark, N. J.

British & French Motor Car Co.—Mutual St., Toronto, Canada. (Daimler, Panhard, Argyll, De Dion, Minerva, Swift.)

British Columbia Auto Co.—924 Granville St., Vancouver, B. C., Canada. (Buick, Pierce-Racine, Ford, Jewel, Russell, Humber, Rover.) Est. Aug. 1, 1906. Not inc. G. Corriveau, Sr., Mgr.; G. G. Corriveau, Jr., Ass't. Mgr.; Chas. A. Ross, Sales Mgr. Garage, 12 cars. Repairing.

Brittania Engineering Co.—Colchester, England. Mfrs. automobiles, gasoline (Brittania.)

Brittania Foundry Co.—Cox St., Coventry, England. Mfrs. jacks.

British Electric Car Co., Ltd.—Oxford Court, Camden St., London, England. Mfrs. automobiles, electric.

Britton, C. O.—Treas. R. D. & C. O. Britton Co., 115-121 Allyn St., Hartford, Conn.

Britton Co., R. D. & C. O.—115-121 Allyn St., Hartford, Conn. (Maxwell.) Est. 1900. Cap. \$40,000. R. D. Britton, Pres.; C. O. Britton, Treas. Repairing.

Britton, R. D.—Pres. R. D. & C. O. Britton Co., 115-121 Allyn St., Hartford, Conn.

Britz, J. N.—148 La Salle St., Aurora, Ill. (Model.)

Brixia-Züst, Fabbrica Automobili.—Brescia, Italy. Mfrs. automobiles, gas. (Brixia-Züst cars.)

Brixton Motor Works.—283 Brixton Rd., London, S. W., England. Mfrs. motors, (automobile.)

Broach.—A tapering tool for enlarging and finishing off round holes which have been drilled or punched. See Reamer.

Broad-Oak Garage.—621-627 E. Broad St., Columbus, Ohio. (Rambler.)

Broad St. Garage.—215-217 N. Broad St., Philadelphia, Pa. Garage.

Broadway Automobile Co., Inc.—Broadway and Madison Sts., Seattle, Wash. (Pierce Arrow, Autocar, Knox, Cadillac, Wood's Electric.) Est. 1902. Cap. \$15,000. (Surplus \$10,000.) F. A. Wing, Managing Owner; Dell Wright, Sales Mgr. Repairing.

Broadway Auto Exchange.—513 7th Ave., New York City. Garage.

Broadway Auto Renting Co.—164 W. 46th St., New York City. Garage.

Broadway Bicycle & Auto Supply Co.—60 Vesey St., New York City. Supplies.

Broadway Motor Car Co.—144 Broadway, Lawrence, Mass. Garage.

Broadway Rubber Tire Works.—1900 Broadway, New York City. Vulcanizing and tire repairing.

Broadwell, E. H.—Vice-Pres. The Fisk Rubber Co., Oak St., Chicopee Falls, Mass.

Broaterman, O. S. H.—Sec. and Gen. Mgr. The John Steptoe Shaper Co., 2961 Colerain Ave., Cincinnati, Ohio.

Broc-Barbier Auto Ignition Co.—143 W. 54th St., New York City. Mfrs. magnetos and ignition dynamos, spark coils, plugs, spark timing devices, electric switches.

Broc Co., The.—1665-1669 E. 40th St., 4021-4023 Payne Ave., Cleveland, Ohio. Mfrs. bodies, tops, wind shields, tire carriers, trimmings, paintings, etc. Cap. \$50,000. Est. 1901. O. P. Fisher, Pres.; P. J. Brown, Vice-Pres. and Mgr.; Gay S. Clappitt, Sec. and Treas.

Broc Co., The.—Payne Ave. and 40th St., Cleveland, O. Mfrs. automobiles, gas.

Brock, A. A.—140 Dearborn St., Chicago, Ill. Mfrs. carburetors.

Brockton Auto Exchange.—51 Ward St., Brockton, Mass. (Jackson, Rapid.)

Brockton Automobile Club.—Edward S. Bryant, Sec. 68 Main St., Brockton, Mass.

Brockway, C. M.—Mgr. Cleveland Branch Winton Motor Carriage Co.

Brodie Electric Co.—42 Pleasant St., Manchester, N. H. (Pope, Waverly.)

Brodie, J. R.—Vice-Pres. The Perfection

tion Reversing Gear & Supply Co., 45 Vesey St., New York City.

Brodie, W. H.—Pres. The Perfection Reversing Gear & Supply Co., 45 Vesey St., New York City.

Brodsky, John E.—Sec. and Treas. Welch Motor Car Co., 1871-1873 Broadway, New York City.

Broehl & Galvin.—Pana, Ill. Garage.

Broesel, Carl.—Gen. Mgr. Simplex Automobile Co., 614 E. 83rd St., New York City.

Broesel, Herman.—Mgr. Simplex Automobile Co., 614 E. 83rd St., New York City.

Brokaw, W. Gould.—Vice-Pres. Allen-Kingston Motor Car Co., 3 W. 44th St., New York City.

Brondow, Doctor Frank W.—86 North St., Pittsfield, Mass. Mfrs. Brondow combination lock switch. Shop 59 Bartlett Ave.

Bronson & Davis.—463 Fairmount Ave., Blue Island, Ill. Mfrs. charging apparatus.

Bronson, C. J.—42 Kent St., Grand Rapids, Mich. (Cadillac, Winton.)

Bronx Automobile Club.—J. Stewart Blackton, Sec. 310 Mott Ave., New York City.

Bronx Auto Garage.—1115 Boston Rd., New York City. Garage.

Bronxville Automobile Club.—Gramatan Inn., Bronxville, N. Y. Henry Burt, Sec. and Treas.

Bronze.—An alloy of tin 2 parts, copper 90 parts, zinc 5 parts and lead 2 parts. For axle-bearings: tin 25 parts, copper 160 parts, zinc 5 parts. For motor-bearings: tin 13 parts, copper 110 parts, zinc 1 part. For flanges: copper 32 parts, zinc 1 part, lead 1 part. For bushings: tin 16 parts, copper 130 parts, zinc 1 part.

Bronze, Aluminum.—A strong, gold-colored alloy, consisting of 10 parts of aluminum and 90 parts of copper.

Bronze, Manganese.—An alloy of copper with ferromanganese. Manganese bronze can be cast in more delicate and intricate shapes than any other, and hence the parts for which it can be employed in automobile construction are innumerable.

Bronze, Phosphor.—A yellow alloy composed of phosphorus, tin and copper. It is very hard and fine-grained, and suitable for the parts of machinery which are exposed to shock.

Brooke, J. W. & Co.—Adrain Works, Lowestoft, England. Mfrs. automobiles, gas. (Brooke cars.) Marine motors.

Brooke, M. E.—1422 Grant Ave., Denver, Col. Sole owner Brooke patents, automobile, motorcycle and vehicle tires.

Brooke Automobile Supply Co.—197 Fulton St., New York City. Supplies.

Brooke Patent Tire Co.—1422 Grant avenue, Denver, Col. Mfrs. automobile, motorcycle and vehicle cellular tires. Not inc. Est. since 1901. Sole owner, M. E. Brooke.

Brookline Garage.—50-60 Washington St., Brookline, Mass. Garage.

Brooklyn Auto & Garage Co.—Brooklyn, Iowa. (Reo, Moline.)

Brooklyn Auto Exchange.—224 State St., Brooklyn, N. Y. Garage.

Brooklyn Automobile Co.—12 New York Ave., Brooklyn, N. Y. Garage.

Brooklyn Coil & Carbureter Co.—77-79 Adams St., Brooklyn, N. Y. Mfrs. carburetors.

Brooklyn Launch Works.—Coney Island, N. Y. Mfrs. motor boats.

Brooklyn Motor Car Co.—1386 Bedford Ave., Brooklyn, N. Y. (Oldsmobile.)

Brooklyn Rubber Co.—397 Summer Ave., Brooklyn, N. Y. Mfrs. tire cement.

Brookner & Co.—Dixon, Ill. Garage.

Brooks, Arthur.—New London Auto Station, 94 Main St., New London, Conn.

Brooks, B. A.—Vice-Pres. Brooks Boat Mfg. Co., Saginaw, Mich.

Brooks Boat Mfg. Co.—Saginaw, Mich. Mfrs. motor boats, marine motors. Cap. \$100,000. C. C. Brooks, Pres. and Gen. Mgr. B. A. Brooks, Vice-Pres.; J. O. Pierce, Sec. and Treas.

Brooks Bros.—22nd St. and Broadway, New York City. Mfrs. miscellaneous wearing apparel.

Brooks, C. C.—Pres. and Gen. Mgr. Brooks Boat Mfg. Co., Saginaw, Mich.

Brooks, Emerson.—B. Nov. 19, 1860, at New York City. Educated at Jackson Military Institute, Tarrytown, N. Y.; King's School, Stamford, Conn.; Paris, France, and Dresden, Germany. Vice-Pres. J. M. Quimby Co., Newark, N. J. Director of the New York State A. C. A. four years as chairman of the Runs and Tours Committee. Organized the first large parade of automobiles in New York, 237 cars, 1903. Treas. of A. C. A. 1905-1906, when the club property was purchased and construction started; chairman membership committee 1905. Asst. starter Vanderbilt Cup Race, 1904-1905-1906. Member Automobile Club of America, Aero Club of America, New York Historical Society, Sons of the Revolution, Congregational Club, Egyptian Research Society, Society Prevention of Cruelty to Children, New England Society, Riding, Driving and Automobile Club, Montclair, N. J. Connected with automobile trade since 1895. Owned first car, 1903. Introduced the building of aluminum bodies in United

States. Recreations, travelling, touring, landscape gardening. Residence, Montclair, N. J.; office, 21-39 Division St., Newark, N. J.

Brooks, J. B. & Co., Ltd.—Great Charles St., Birmingham, England. Mfrs. tire bands, non-skids.

Brooks, J. W.—Head Sales Dept. Pass & Seymour, Inc., 52 Boyd Ave., Solvay, N. Y.

Brooks, Leslie E.—Pensacola, Fla. (Pope Hartford.)

Brooks Motor Car Co.—508 Howard St., Detroit, Mich. Mfrs. automobiles, gas.

Brooks, Stanley.—Mgr. Continental Caoutchouc Co., Detroit, Mich.

Brophy Belting & Supply Co.—La Grange, Ill. Mfrs. belting.

Brotherhood-Crocker Motors, Ltd.—19 Hanover Square, London, W., England. Mfrs. automobiles, gas. (Brotherhood cars.)

Brouhout, Usines.—Vierzon, Cher, France. Mfrs. automobiles, gas, trucks, automobile motors.

Brouse, W. B.—Massena, N. Y. (Rapid.)

Brouse, W. E.—Cleveland, O. Garage.

Brousseau, D.—Sauz-Vaussais, Deux-Sevres, France. Mfrs. tops.

Brower, C. E.—Portland, Me. Garage.

Brower, C. E.—Woodford, Me. (Haynes.)

Brower, Chas. Dr.—Pres. Nashville Motor Car Co., cor. Church and 9th Sts., Nashville, Tenn.

Brown, A. B.—Gloversville, N. Y. (Waltham.)

Brown, A. D.—Sec. American Auto Co., Cleveland, Ohio.

Brown, A. E.—Mechanical Dept. National Auto Co., 957 Main St., Los Angeles, Cal.

Brown, Alexander T.—B. Nov. 21, 1854, at Scott, Cortland Co., N. Y. Educated at common schools, privately and Homer (N. Y.) Academy. Pres. Smith Premier Typewriter Co. Director Brown Lipe Gear Co., H. H. Franklin Mfg. Co., Smith Premier Typewriter Co., Syracuse Aluminum & Bronze Co., Globe Malleable Iron Co., Syracuse Journal Co., Third National Bank, Clere Clothing Co., C. H. Wood Co. Member Transportation Club of New York, Syracuse Yacht Club, Citizens, Old Heidelberg, Century & Country Clubs of Syracuse, Adirondack League Club, Bankers & Brokers Club of Clayton, N. Y., Syracuse, Frontenac and Chippewa Bay Yacht Club, Frontenac Yacht Club. Trustee Syracuse University. Member Syracuse Chamber of Commerce. Trustee Hospital of the Good Shepherd. Member National Geographical Society. life member American Society Mechan-

ical Engineers. Connected with automobile trade since 1899. Owned first motorboat 1895, automobile 1900. Recreations, general. Residence 608 W. Onandaga St., Syracuse, N. Y.

Brown, Alfred J.—Vice-Pres. Couple-gear Freight Wheel Co.—Ashton Bldg., Grand Rapids, Mich.

Brown & Barlow.—16 Leveday St., Birmingham, England. Mfrs. carbureters.

Brown & Beck.—1737 Champa St., Denver, Col. Agts. American and M. & M. motorcycles. Mfrs. motorcycles.

Brown & Co., S. N.—Dayton, Ohio. Mfrs. top bows, top fixtures.

Brown & Co. (T. H.)—Corry, Pa. Garage.

Brown & Pinney.—Stafford Springs, Conn. (Maxwell.)

Brown & Schmidt.—10 Lee Place, Paterson, N. J. (Rambler, Maxwell, Grout.)

Brown & Scott Co.—Wellsville, N. Y. (Ford, National.)

Brown & Sharp Mfg. Co.—Providence, R. I.—Mfrs. special automobile machinery, circulating pumps.

Brown, A. S.—Prop. Bolton Automobile Co., 100-106 Dalplin St., Baltimore, Md.

Brown's Automobile Co.—177-179 Princess St., Winnipeg, Canada. (Rambler, Northern.)

Brown Auto Top Co.—Philadelphia, Pa. Mfrs. auto tops.

Brown, Birt.—Malone, N. Y. (Maxwell.)

Brown, B. L.—1126 S. Main St., Los Angeles, Cal. (Pope Waverly.)

Brown, B. P.—Sec. and Treas. Iowa Auto Co., Ottumwa, Iowa.

Brown Bros., Ltd.—Deansgate, Manchester, England. Mfrs. automobiles, gas. (Brown cars.)

Brown Bros., Ltd.—Great Eastern St., London, England. Mfrs. Brown motorcycles.

Brown, B. S.—Head of Purch. Dept. Willard Storage Battery Co.—1279-1281 Bank St., Cleveland, Ohio.

Brown Buggy Co.—Waterloo, Iowa. (Jackson.)

Brown, Caxton.—Sec. Western Electrical Co., Waverly Park, Newark, N. J.

Brown, Chas. A.—Woodfield, Ohio. (Jewel.)

Brown, Chas. M.—Mgr. San Francisco Branch Winton Motor Carriage Co.

Brown-Cochran Co., The.—Lorain, Ohio. Mfrs. marine gasoline motors.

Browne & Wright.—St. Johnsbury, Vt. (Maxwell.)

Brown, Edward H.—Sec. and Gen. Mgr. Brown-Talbot Co., 19 Oakland St., Salem, Mass.

Browne-Friend Motor Co.—230 Wisconsin St., Milwaukee, Wis. (Mitchell.)

Brownell & Burt.—Taunton, Mass. (Lambert.)

Brownell Motor Co., F. A.—634-6 Lexington Ave., Rochester, N. Y. Mfrs. automobile and marine motors, transmissions, carbureters, circulating pumps.

Brown, E. T.—Montgomery Center, Vt. (Waltham.)

Browne, W. D.—132 S. Genesee St., Waukegan, Ill. Garage.

Brown, E. W.—Vice-Pres. Keiser Van Leer Co., 505-507 N. East St., Bloomington, Ill.

Brown, Frank.—Sec. and Treas. Commercial Truck Co. of America, 1222 Arcade, Philadelphia, Pa.

Brown, Geo. H.—Sec. and Treas. Winton Motor Carriage Co., Cleveland, O.

Brown, H. A.—Oneonta, N. Y. (Waltham, Haynes.)

Brown, Henry D.—Treas. Imperial Motor Car Co., Third and Locust Sts., Williamsport, Pa.

Brown, Henry W.—517-521 E. Water St., Syracuse, N. Y. Mfrs. cylinder compression meters.

Brown, H. H.—Southbury, Conn. (Waltham, Cadillac.)

Brown, H. R.—Brown Mfg. Co., Greenville, Tenn. (Haynes.)

Brown, H. W.—Mgr. Binghamton Motor Car Co., 172-6 State St., Binghamton, N. Y.

Browning Bros. Co.—2461 Washington Ave., Ogden, Utah. Agts. Mitchell. Est. 1879. Cap. \$100,000. J. M. Browning, Pres.; M. S. Browning, Vice-Pres.; Geo. E. Browning, Sec. and Treas. Repairing.

Browning, F. U.—Pres. Uncas Specialty Co., 21 Shipping St., Norwich, Conn.

Browning, Geo. E.—Sec. and Treas. Browning Bros. Co., 2461 Washington Ave., Ogden, Utah.

Browning, J. M.—Pres. Browning Bros. Co., 2461 Washington Ave., Ogden, Utah.

Browning Mfg. Co.—Milwaukee, Wis. Mfrs. electric motors.

Browning, M. S.—Vice-Pres. Browning Bros. Co.—2461 Washington Ave., Ogden, Utah.

Brown, J. Addison.—Champaign, Ill. (Peerless.)

Brown, J. Burgess, Jr.—Advt. Mgr. Pope Motor Car Co., 139 S. East St., Indianapolis, Ind.

Brown, J. F.—Cynthiana, Ky. (Waltham.)

Brown, J. L.—Bisbee, Arizona. (Reo.)

Brown, J. M.—Mansfield, O. Garage.

Brown, J. W.—Mgr. Couple Gear Freight Wheel Co., Ashton Bldg., Grand Rapids, Mich.

Brown-Lipe Gear Co.—208 S. Geddes St., Syracuse, N. Y. Mfrs. sliding gear transmissions, differential gears, steer-

gears. Member M. & A. M. Cap. \$150,000. Est. 15 years. Alex. T. Brown, Pres.; Willard C. Lipe, Vice-Pres.; H. W. Chapin, Sec. and Treas.

Brown, L. W.—Elkland, Pa. Garage.

Brown Mfg. & Garage Co., J. C.—Buttler, Ind. Mfrs. anti-skid devices, chain tools.

Brown Mfg. Co.—J. B. Columbus, O. Mfrs. acetylene generators, lamps.

Brown Motor Co., H. Oscar.—229 N. Broad St., Philadelphia, Pa. (Berliet.)

Brown Oil Can Co.—Dawson St., Toledo, Ohio. Mfrs. oil cans, storage tanks.

Brown, Paul A.—Des Moines, Iowa. (Waltham.)

Brown, P. J.—Vice-Pres. and Mgr. The Broc Co., 1665-1669 E. 40th St., 4021-4023 Payne Ave., Cleveland, O.

Brown, R. S.—Mgr. of Sales Automobile Dept. Acme White Lead & Color Works, Detroit, Mich.

Brown's Garage.—60 St. George St., Toronto, Canada. Garage.

Brown Talbot Co.—19 Oakland St., Salem, Mass. Mfrs. gasoline motors. Cap. \$99,000. Est. 1903. John Talbot, Pres.; Dudley Talbot, Treas.; Edward H. Brown, Sec. and Gen. Mgr.

Brown, Thompson & Co.—Main St., Hartford, Conn. (Packard, Cadillac, Stevens-Duryea.)

Brown, W. B.—Pittsburg, Pa. (Dragon.)

Brown, Will H.—Purch. Agt. Pope Motor Car Co., 139 S. East St., Indianapolis, Ind.

Brown, W. J.—Wellman, Iowa. (Glide.)

Brown, W. T.—Treas. A. G. Spaulding & Bros., 29 W. 42d St., New York City.

Broyton, W. J.—Mgr. Tanberg Auto Co., La Crosse, Wis.

Bruce Motor Co., Inc.—100 Cass Ave., Joliet, Ill. (Buick, Knox, Haynes.)

Brugger & Smith.—Fond du Lac, Wis. (Waltham.)

Brummitt, T. J.—Evansville, Ind. Garage.

Bruneau et Cie.—12 rue Victor Hugo, Tours, France. Mfrs. motorcycles.

Brunell Auto Co.—38 Exchange Place, Worcester, Mass. (Jackson.)

Brunel, E. H.—359 Fulton St., Troy, N. Y. Garage.

Brunet-Loiseau Frères.—13 rue des Francs-Bourgeois, Paris, France. Mfrs. coils.

Brummeyer, L. H.—12 S. La Salle St., Aurora, Ill. (Premier, Reo.)

Brunner, A. N.—Pres. New Jersey Automobile Co. 855-857 Springfield Ave., Newark, N. J.

Brunn's Carriage Manufactory Co.—1140 Main St., Buffalo, N. Y. Mfrs.

wood and metallic bodies. (Stevens-Duryea.)

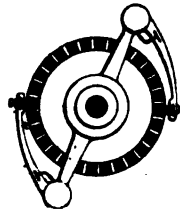
Bruno-Knapp Co.—Saginaw, W. S., Mich. Mfrs. gasoline marine motors.

Brunon et Vallette.—Rive-de-Gier, Loire, France. Mfrs. pressed steel frames.

Brunton, H. O.—Sec. and Treas. Cincinnati Auto Co., 215-219 E. 5th St., Cincinnati, Ohio.

Brunt Porcelain Works, G. F.—E. Liverpool, Ohio. Mfrs. porcelain.

Brush.—A contact device (originally a bunch of springy wires) built up of



strips of copper or copper gauze, or consisting of small blocks of carbon, for taking off the current from the revolving commutator of a dynamo (see figure); or for est-

ablishing contact at definite intervals, as in the contact-maker of a gasoline-motor.

Brush, Alanson P.—Designer, Brush Runabout Co., 14-16 Baltimore Ave., W., Detroit, Mich.

Brush.—A. P.—Quinby, Va. (Cadillac.)

Brush Electric Engineering Co.—Victoria Works, Bevedere Rd., Lambeth, London, England. Mfrs. automobiles, gas, comm. (Brush omnibus.)

Brush, File.—A cylindrical bundle of fine steel or brass wires, tied in the center and used for cleaning files; called also a "scratch brush."

Brush-holder.—The support in which is clamped the copper or carbon brush by means of which the current enters or leaves a motor or dynamo. It is usually carried by a "rocker frame."

Brush Runabout Co.—14-16 Baltimore Ave., W. Detroit, Mich. Makers of the Brush runabout. Cap. \$200,000. Est. 1907. Geo. B. Yerkes, Pres.; John A. Boyle, Vice-Pres.; Frederick A. Harris, Sec.; Emil D. Moessner, Treas.; Frank Briscoe, Gen. Mgr.; Alanson P. Brush, Designer; A. J. Kinnucan, Purch. Agt.

Brush, W. A.—Mgr., Packard Motor Co.'s branch, 1861 Broadway, New York City.

Bryan, Jonathan.—Pres. Richmond Forgings Corporation, Belle Isle, Richmond, Va.

Bryant & Berry Co.—34 West Atwater St., Detroit, Mich. Mfrs. automobile steering wheels. Cap. \$3,000. Est. 1907. John Walters, Pres.; Ellsworth S. Bryant, Vice-Pres.; Alexander Cohen, Sec. and Treas.

Bryant & Johnson.—120 E. 84th St., New York City. Garage.

Bryant, Ellsworth S.—Vice-Pres. Bry-

ant & Berry Co., 34 West Atwater St., Detroit, Mich.

Bryant Garage—50-56 W. 43d St., New York City. Est. October, 1905. Cap. \$10,000. Hermann L. Baer, Pres.; William H. Morgan, Treas.; A. Loucas, Storage Mgr.; William Charles, Foreman Mechanic. Garage, 100 cars. Repairing.

Bryant Motor Co.—110 W. 41st St. and 1675 Broadway, New York City. Est. 1904. M. D. Bouton, Pres.; James H. Scatt, Supt.; H. T. Birnie, Sales Mgr. Conduct automobile rental business.

Bryant Steel Wheel & Rim Co.—454 Hayden Bank Bldg., Columbus, Ohio. Mfrs. steel rims, tubular steel wheels.

Bryant, Walter.—Vice-Pres. Albany Automobile Co., Albany, Ind.

Bryson, T. A.—5-9 Perry St., East, Savannah, Ga. (Franklin, Cadillac, Columbia.) Est. 1892. J. E. Thompson, Supt. Repair Dept.; H. A. Jacobs, Supt. Elect. Dept. Garage, 150 cars. Repairing.

Bubb, H. H.—Sec. Imperial Motor Car Co., Third and Locust Sts., Williamsport, Pa.

Bubbs, Amos.—Glen Rock, Pa. (Maxwell.)

Buchanan, Wm.—Duluth, Minn. (Buick.)

Buchet, Paul.—13 rue du Général Dufour, Geneva, Switzerland. Mfrs. acetylene lamps.

Buchet, Usines.—Levallois-Perret, France. Mfrs. aeronautic and automobile motors.

Buchillet, P.—47 rue St., Ferdinand, Paris, France. Mfrs. pneumatic tires, non-skids.

Buch, Pedro.—2a Rivera de Santa Maria No. 7, Mexico City. Mexico. (Mitchell, Compound.)

Buck Automobile, Carriage & Implement Co.—Walsh Bldg., Davenport, Iowa. (Buick, Locomobile, Peerless, White, Franklin, Royal, Logan, Haynes.)

Buckboard.—A vehicle in which a long elastic plank takes the place of framing, and which is mounted on four wheels. It might be called a double spring suspension vehicle, since it is provided with a set of springs on each axle as well. Like the buggy, the "buckboard" is suitable for any kind of road. A typical example is the "Orient." Buckboards may have one or more seats, but never have tops except over one seat.

Buck Bros.—708 Garfield St., Bay City, Mich. (Queen.)

Bucket Valve.—See Valve, Bucket.

Buckeye Auto Co.—753 E. Long St., Columbus, Ohio. Repairing.

Buckeye Automobile Co.—441 Bank St., Cincinnati, O. (Monarch, Cameron.)

Buckeye Garage.—So. 8th St., near Main, Zanesville, O. (Reo, Ford.)

Buckeye Garage Co.—6112 Euclid Ave., Cleveland, O. Repairing.

Buckeye Iron & Brass Works.—324 E. 3rd St., Dayton, Ohio. Mfrs. aluminum, brass, bronze, copper castings, brass pipe fittings.

Buckeye Jack Mfg. Co.—Louisville, O. Mfrs. jacks.

Buckeye Mfg. Co.—1801 Columbus Ave., Anderson, Ind. Makers of the Lambert pleasure and commercial cars, first marketed 1900. Nine different models made since. Cap. \$100,000. B. F. Lambert, Pres. and Supt.; S. W. Lambert, Vice-Pres.; J. W. Lambert, Sec., Treas., Gen. Mgr. and Designer; A. R. Lambert, Purch. Agt.; G. B. Louderback, Sales and Advt. Mgr. Agents and dealers: Adland Motor Co., 900 Madison St., Chicago, Ill. Automobile Supply & Storage Co., 1416 Madison Ave., Baltimore, Md. Bailey, Geo., 421 Clinton St., Milwaukee, Wis. Bartoo, Geo. E., 409 1st Ave., Spokane, Wash. Chester Co., John W., 114 3rd Ave., Nashville, Tenn. Coffin, E. C., 330 D. F. Walker Bldg., Salt Lake City, Utah. Eaton, C. A., 22 E. Concord St., Boston, Mass. Gustin Automobile Co., 1307 Sycamore St., Cincinnati, Ohio. Herbert Havens, 1618 Wazee, St., Denver, Col. Janney Auto & Launch Co., 6040 Hurst St., New Orleans, La. Lambert Auto Co., 343 Golden Gate Ave., San Francisco, Cal. J. B. McIntosh Auto Co., 199 Jefferson Ave., Detroit, Mich. McLean Automobile Co., 1604 Broadway, New York City. Meyer, R., 151 Main St., Springfield, Mass. More Bros., Wimbledon, N. D. Newmarch, L. A., Sidney, New South Wales. Paige, M. M., 302 Highland Drive, Seattle, Wash. Pegues, P. T., care Imperial Hotel, Dallas, Tex. Pitts & Wiseley, Roswell, N. M. Reese Machine & Tool Works, Plymouth, Pa. Riggs Land Co., Redfield, S. D. Shore & Beach, 809 P St., Lincoln, Neb. Sullivan, D. B., Auto Co., 27 N. Capital Ave., Indianapolis, Ind. Tampa Auto & Garage Co., Tampa, Fla. Alfred Josef Tippel, Wien, Oesterreich 13, Einzerrasse 85, Vienna, Austria, Hungary. Waterville Motor Co., Waterville, Me. Wheelwright, Geo. F., 488 Broad St., Providence, R. I.

Buckeye Motor Co.—201 S. High St., Columbus, O. Mfrs. motorcycles. (Rambler.)

Buck, L. K.—Freehold, N. J. Mfrs. tire valves.

Buckle.—A permanent distortion or bend, as in a plate or rod.

Buckman & Law.—442 State St., New Haven, Conn. (Rambler.)

Buckman, E. H.—Director Chadwick

Engineering Works, 3207 Spring Garden, St., Philadelphia, Pa.

Bucyrus Cycle & Auto Co.—Bucyrus, O. (Maxwell, Rambler, Pope-Waverley, Mitchell.)

Buda Foundry & Mfg. Co.—Chicago, Ill. Mfrs. jacks.

Budd & Ranney Mfg. Co., The.—35-37 S. Scioto St., Columbus, Ohio. Mfrs. gasoline, automobile and marine motors.

Budd, P. R.—Pres. Hiland Automobile Co. 5811-5817 Center Ave., Pittsburgh, Pa.

Budd, W. H., Jr.—Officer The Quad Mfg. Co., 3-7 S. Scioto St., Columbus, Ohio.

Budlong, Milton John.—Born Rockford, Ill. Elected

General Manager Association of Licensed Automobile Manufacturers November, 1907, to succeed E. H. Cutler. Was President Electric Vehicle Co. from 1903, when he succeeded Geo. H. Day, until the summer of 1907. Has been prominently identified with the automobile industry

since 1898. Member Engineers and Transportation Clubs, New York; Farmington (Conn.) Country Club, Chicago Athletic Association and Hartford Automobile Club. Residence address, Algonquin Hotel; office address, 7 E. 42nd St., New York City.

Budwell, W. H.—Designer Mora Motor Car Co., Newark, New York.

Buehler, H.—Head of Shipping Dept., Jos. M. Smith & Co., 4th and Porter Sts., Detroit, Mich.

Buehne, Fred'k W.—Pres. The Buehne Steel Wool Co., 93 Nassau St., New York City.

Buehne Steel Wool Co., The.—93 Nassau St., New York City. Mfrs. steel wool. Cap. \$5,000. Est. 1898. Fred'k W. Brehne, Pres.; Paul C. Schnitzler, Vice-Pres.; Constantine Pilz, Sec. and Treas.

Buell & Co., D. H.—516 State St., New Haven, Conn. Garage.

Buell, F. O.—Pres. Automobile Owners Supply Depot, 1655 Broadway, New York City.

Buell, J. C.—Rives Junction, Mich. Repairing.

Buff.—A wheel covered with leather, on which emery flour, etc., is placed for polishing metallic objects.

Buffalo Aluminum Co.—442 Ellicott Sq., Buffalo, N. Y. Mfrs. aluminum.

Buffalo Auto Body & Trimming Co.—338-340 Ellicott St., Buffalo, N. Y. Mfrs.

touring and runabout bodies, top upholstery, wind shields. Cap. \$25,000. Est. 1897. L. C. Beesing, Pres. and Mgr.; J. A. Hislop, Sec. and Head of Woodwork Dept.; Jacob Miller, Treas. and Head of Trimming Dept.

Buffalo Auto Exchange.—401 Franklin St., Buffalo, N. Y. (Franklin.) Est. 1901. John J. Johnson, Mgr. Garage, 50 cars. Repairing.

Buffalo Auto Livery.—123 W. Eagle St., Buffalo, N. Y. Garage.

Buffalo Automobile Station.—240 W. Utica St., Buffalo, N. Y. Garage.

Buffalo Automobile Trade Association.—Buffalo, N. Y.

Buffalo Auto Truck & Motor Co.—35 Mississippi St., Buffalo, N. Y. Mfrs. automobiles, commercial, gas.

Buffalo Belting Works.—137 Washington St., Buffalo, N. Y. Mfrs. belting.

Buffalo Bolt Co.—East Ave. and Oliver St., Tonawanda, N. Y. Mfrs. bolts and nuts.

Buffalo Carburetor Co.—889 Main St., Buffalo, N. Y. Mfrs. carburetors. Supplies.

Buffalo Crucible Casting Co.—25 Washington St., Buffalo, N. Y. Mfrs. steel castings.

Buffalo Dental Mfg. Co.—587-589 Main St., Buffalo, N. Y. Mfrs. brazing blowpipes, hardening and tempering furnaces. Theo. G. Lewis, Pres.; Wm. Gram, Jr., Treas.; Chas. O. Rother, Sec.; Joseph Harder, Mgr.

Buffalo Electroplating Co.—78 Oak St., Buffalo, N. Y. Repairing.

Buffalo Enamel & Stain Co.—481 Ellicott Sq., Buffalo, N. Y. Mfrs. enamel, paints, automobile body polishes, varnishes.

Buffalo Engine Co.—12-20 Perry St., Buffalo, N. Y. Mfrs. gasoline automobile motors.

Buffalo Emery Wheel Co.—127 Ash St., Buffalo, N. Y. Mfrs. emery wheels.

Buffalo Excelsior Machine Co.—Military Rd., Buffalo, N. Y. Mfrs. steel balls.

Buffalo Forge Co.—Buffalo, N. Y. Mfrs. forge equipment.

Buffalo Foundry Co.—Buffalo, N. Y. Mfrs. gray iron castings.

Buffalo Garage Co.—414 W. Ferry St., Buffalo, N. Y. Garage.

Buffalo Gasoline Motor Co.—1280-1290 Niagara St., Buffalo, N. Y. Mfrs. marine motors. Cap. \$100,000. Est. 1898. L. A. Fischer, Pres.; A. F. Dohn, Vice-Pres.; A. Snyder, Sec. and Treas.

Buffalo Mill Supply Co.—210-212 Main St., Buffalo, N. Y. Mfrs. belting, packing.

Buffalo Motor Car Co.—437 Pearl St., Buffalo, N. Y. (Autocar, Hotchkiss, Cartercar.) Supplies.



Buffalo Rubber Mfg. Co.—Sussex Ave. and Erie R. R., Buffalo, N. Y. Mfrs. tire cement, tire treads, inner tire tubes. Purch. Agt.; H. E. Shiland, Sales Mgr.; W. H. Little, Factory Mgr.; H. H. Hills, Ass't Sales Mgr.

Buffalo Specialty Co.—3751-3777 Elliott Sq., Buffalo, N. Y. Mfrs. tire cement, automobile body polishes, tire fluid.

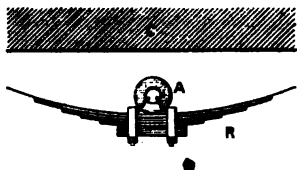
Buffalo Steel & Shafting Co.—Works, Ft. Baitz Ave., Buffalo, N. Y. Mfrs. steel.

Buffalo Steel Co.—Fillmore Ave., Tonawanda, N. Y. Mfrs. steel.

Buffalo Weaving & Belting Co.—234 Chandler St., Buffalo, N. Y. Mfrs. belting.

Buffaud, Robatel et Cie.—59 chemin de Baraban, Lyon, France. Mfrs. automobiles, steam, comm. (tractors.)

Buffer.—A rubber cushion or spring



placed in a motor vehicle spring to prevent an undue compression.

Buffum Co., H. H.—Abingdon, Mass. Mfrs. motorboats.

Bugee, Byrne D.—Main and Front Sts., Putnam, Conn. (Pope Hartford.) Est. 1904.

Bugee, C. S.—Salesman The Auto Motor Car Co., 804-808 Sycamore St., Cincinnati, Ohio.

Buggy.—A popular and well known American vehicle, always furnished with a folding leather top, and having one seat and a rear-boot or space behind. As a general thing the seat is quite low from the frame, and the lower part of the body is a sort of box or simply a flat surrounded with a railing. The motor buggy is mounted on high wheels, and is usually driven by belts or chains.

Bug Thunder Mfg. Co.—Belvidere, Ill. Repairing.

Buhl Malleable Iron Co.—Detroit, Mich. Mfrs. malleable iron castings.

Buick Automobile Co.—15th St. and Virginia Ave., Kansas City, Mo. (Buick, Thomas Flyer.)

Buick Motor Co.—1412 Michigan Ave., Chicago, Ill. (Buick.)

Buick Motor Co.—Flint, Mich., Makers of the Buick car, first marketed Aug. 1904. Eight different models made since. C. M. Begole, Pres.; Geo. L. Walker, Vice-Pres.; W. S. Ballanger,

Treas.; W. C. Durant, Gen. Mgr.; W. L. Marr, Designer; Ben Rosenzweig, Jr.; H. E. Shiland, Sales Mgr.; W. H. Little, Factory Mgr.; H. H. Hills, Ass't Sales Mgr. Branches, Buick Motor Co. of Chicago, Ill., W. J. Meade, Mgr.; Buick Auto Co., Kansas City, Mo., M. Hathaway, Mgr. Agents and dealers:

Abbott's Garage, Fort Worth, Tex. Allen & Garner, Tahoka, Tex. American Motor & Cycle Co., Battle Creek, Mich. Anderson Brothers, Marietta, Ohio. Anniston Hardware Co., Anniston, Ala. Army Cycle Mfg. Co., 130 Meeting St., Charleston, S. C. Automobile & Machy. Co., 221 2d St., Macon, Ga. Auto Outing & Tran. Co., Baltimore, Md. Automobile & Supply Corp., 67 Broadway, New Haven, Conn. Avis, George F. & Son, Hudson, Mich. Bachelor, C. A., Angola, Ind. Bartlett & Frasier, Huntington, Ind. Bates-Odenbrett Auto Co., 503 Broadway, Milwaukee, Wis. Bates-Tannahill Co., Greenville, S. C. Beach, J. C., Sabinsville, Pa. Bilz, Charles, 1432 Court Pl., Denver, Col. Binghamton Motor Car Co., 172 State St., Binghamton, N. Y. Black Auto Co., Sid., 630 Walnut St., Cincinnati, Ohio. Blair, Wiley, Wichita Falls, Tex. Blomberg, Frank C., & Co., 317 Tenn. Trust Bldg., Memphis, Tenn. Boyd Automobile Co., 415 Massachusetts Ave., Indianapolis, Ind. British Columbia Auto. Co., 924 Grandville St., Van Couver, B. C., Canada. Buch Auto. Carriage & Impl. Co., Davenport, Ia. Buick Automobile Co., 1108 E. 15th St., Kansas City, Mo. Buick Motor Co., 1412 Michigan Ave., Chicago, Ill. Cameron Auto Co., 313 Commerce St., Dallas, Tex. Capital City Auto. Co., Atlanta, Ga. Capital City Garage., 217 N. Perry St., Montgomery, Ala. Carlow Automobile Co., Taunton, Mass. Central Penn. Auto. Co., 111 Market St., Harrisburg, Pa. Cia-Pan-Americana, de Vehiculos, S. A., Mexico City, Mexico. Chaste, Charles S., Portland, Me. Chesbro, Ernest P., Willimantic, Conn. Clark, C. D., Torrington, Conn. Clarke, E. R., The Auto Co., Brattleboro, Vt. Clough, C. Roy, 35 W. Mound St., Columbus, Ohio. Connerat, R. V., 18 E. State St., Savannah, Ga. Consolidated Wagon & Machine Co., Salt Lake City, Utah. Cook Auto. Carriage & Implement, Co., Orlando, Fla. Diebold Motor Car Co., 5th and McKinley Sts., Canton, Ohio. Dietrich & Co., 24 N. 10th St., Allentown, Pa. Excelsior Carriage Co., White River Junction, Vt. Fiske Auto Co., 167 Pine St., Providence, R. I. Flock & McBee, 50 St. Joseph St., Mobile, Ala. Frederickson, H. E., 1502 Capitol Ave., Omaha, Neb. Grant Brothers Auto Co.,

744 Woodward Ave., Detroit, Mich. Groves, H. B. Co., 609 Pierce St., Sioux City, Ia. Halladay, Floyd, Hotel Downey, Lansing, Mich. Halsey Automobile Co., 3910 Olive St., St. Louis, Mo. Hamilton Motor Car Co., The, 26 N. 2d St., Hamilton, Ohio. Hannan & Henry Motor Car Co., 29 Catherine St., Ogdensburg, N. Y. Henderson Auto. Co., The, Cedar Rapids, Ia. Hiland Automobile Co., 5811 Center Ave., Pittsburgh, Pa. Hinman, Benj., Newport, Vt. Hokanson Auto Co., Madison, Wis. Holland & Campbell, Clarksdale, Miss. Howard Automobile Co., 404 Golden Gate Ave., San Francisco, Cal. Hutto & Co., Jacksonville, Fla. Imperial Motor Co., 1100 Main St., Buffalo, N. Y. Johnson & Giles, Tampa, Fla. Johnson, Walter B., Essex Junction, Vt. Joyce, Auto Co., F. G., 705 Chestnut St., Chattanooga, Tenn. Keats, H. L., Auto Co., 80 7th St., Portland, Ore. Keeler, E., Co., Williamsport, Pa. Kentucky Automobile Co., 1049 Third Ave., Louisville, Ky. Kerr, M. W., 571 S. Clinton St., Syracuse, N. Y. Keystone Motor Car Co., 240 N. Broad St., Philadelphia, Pa. Kirk Bros. Automobile Co., 915 Jefferson Ave., Toledo, Ohio. Koehler, H. J., S. G. Co., 845 Broad St., Newark, N. J. Krueger Automobile Co., 233 Main St., Oskosh, Wis. Lancaster Automobile Co., 215 N. Prince St., Lancaster, Pa. Latham, C. H., 30 Lackawana Ave., Norwich, N. Y. Little Rock Auto Co., 311 W. 3d St., Little Rock, Ark. Luttrell Co., The, 1711 14th St., N. W., Washington, D. C. Mack, H. A., Lima, Ohio. Magna, R. W., Holoyoke, Mass. Manchester Auto Garage, Manchester, N. H. Mansfield Auto & Supply Co., 64 N. Walnut St., Mansfield, Ohio. Manuel, G. M., Edmonton, Alberta, Canada. McClure, D. P., Oskaloosa, Ia. McCulloch & Boswell, Ellice Ave. and Halgrave St., Winnipeg, Manitoba, Canada. Miner Garage, The, High and Allyn Sts., Hartford, Conn. Moise, E. W., Jr., Sumter, S. C. Mosehart & Kellar Co., Houston, Tex. Motor Transfer Co., Richmond, Va. Nalle, Ewell, 601 E. 6th St., Austin, Tex. Nelson Automobile Co., 216 Main St., Springfield, Mass. Newman Investment Co., El Paso, Tex. Noakes Bros., Corpus Christi, Tex. Norcross Automobile Co., 43 Foster St., Worcester, Mass. Norris Auto. Co., Saginaw, Mich. Ohio Motor Car Company, 2142 E. 9th St., S. E., Cleveland, Ohio. Ohnhaus Automobile Co., 219 Pearl St., Fort Wayne, Ind. Painter, G. W., Winston, N. C. Palis, F. W., Spring St., Shreveport, La. Peckham Carriage Co., The, 19 S. Kenton St., Dayton, Ohio. Pence Automobile Co., 717 Hennepin Ave., Minneapolis, Minn. Pioneer Auto Co., Santa Rita Hotel, Tuscon, Ariz. Pou & What-

ley Co., Columbus, Ga. Poyer, D. F., Menominee, Mich. Pratt, A. J., Coldwater, Mich. Prichard, R. Stanley, Portsmouth, Ohio. Randall, A. G., 109 N. 11th St., Boise, Idaho. Reading Automobile Co., The, 5th and Cherry Sts., Reading, Pa. Riddel Automobile Co., 720 Locust St., Des Moines, Ia. Roswell Automobile Co., The, Roswell, New Mexico. Rutland Machine and Auto Co., Rutland, Vt. Sallander, A. W., Fort Madison, Ia. Scranton Garage & Motor Car Co., Scranton, Pa. Sidles Automobile Co., 13th and P Sts., Lincoln, Neb. Slaughter, R. L., Midland, Tex. Smith, A. R., 809 E. Kearsley St., Flint, Mich. Smith, George W., Littleton, N. H. Smith, W. S., 24 Temperance St., Toronto, Ontario, Canada. Snow Hardware Co., 36 Union St., Rockville, Conn. Southern Automobile Co., Nashville, Tenn. Staacke Bros., 133 W. Commerce St., San Antonio, Tex. Standard Automobile Garage, 234 N. Phelps St., Youngstown, Ohio. Stoltz, C. C., Marion, Ohio. Stranahan-Eldridge Co., 541 Tremont St., Boston, Mass. Tanberg Auto Co., Eau Claire, Wis. Testard, H. A., 341 St. Charles St., New Orleans, La. Travis Auto Co., C. W., 23 Main St., Evansville, Ind. Toyah Rapid Transit Co., Toyah, Tex. Troy Automobile Exchange, 22 4th St., Troy, N. Y. Union Auto. Garage Co., The, 35 S. College St., Akron, Ohio. Utica Motor Car Co., 333 Bleeker St., Utica, N. Y. Walker, J. G., San Angelo, Tex. Waterloo Auto, & Supply Co., Waterloo, Ia. Weaver, C. H., 255 Elm St., Oil City, Pa. Western Motor Car Co., 415 S. Hill St., Los Angeles, Cal. Whiting, C. L., 591 Main St., E. Rochester, N. Y. Williams, J. J. & Son, Montpelier, Vt. Wilson & Co., 117 Craig St., West Montreal, P. Q., Canada. Wolfe, W. H. & L. C., 1011 Chestnut Ave., Altoona, Pa. Wyeth Auto. & Supply Co., 316 N. 2d St., St. Joseph, Mo. Wyoming Valley Motor Car Co., 35 N. Washington St., Wilkesbarre, Pa.

Buick-Waller Co.—Ottawa and Louis Sts., Grand Rapids, Mich. (Buick, Pope-Toledo.)

Buineau, Georges.—24 rue Parmentier, Courbevoie, Seine, France. Mfrs. wood wheels.

Buisson, Gustav-Adolph.—1 rue Amelot, Paris, France. Mfrs. tire pumps, gauges.

Bulett, W. S.—Cor. 53d and Webster Sts., West Philadelphia, Pa. (Sayers and Scovill truck.)

Bulger, W. J.—Oswego, N. Y. (Jewel.)

Bulkley & Co., H. R.—South Norwalk, Conn. (Pope-Hartford, Pope-Toledo, Pope-Waverly.)

Bulkley's Auto Station.—Sacao Bridge, Southport, Conn. (Lozier, Corbin.) Est. 1904. Not inc. B. F. Bulkley, Prop.; J. N. Bulkley, Mgr. Garage, 10 cars. Repairing. Supplies.

Bulkley, B. F.—Prop. Bulkley's Auto Station, Southport, Conn.

Bulkley, J. N.—Mgr. Bulkley's Auto Station, Southport, Conn.

Bullard Automatic Wrench Co.—Providence, R. I. Mfrs. wrenches.

Bullard, J. H.—777 State St., Springfield, Mass. Mfrs. speedometers, speed-recorders.

Bullard Machine Co.—Bridgeport, Conn. Mfrs. special automobile machinery.

Bulletin Officiel de la Chambre Syndical de L'Automobile.—Published at 6 place de la Concorde, Paris, France.

Bulletin Officiel de la Commission Technique.—(Official Bulletin of the technical committee of the Automobile Club of France.) Published at 6 place de la Concorde, Paris, France.

Bull, Henry, Jr.—12 Bull St., Newport, R. I. Garage.

Bullock, E. A.—112 S. 7th St., Norfolk, Neb. (Waltham.) Est. 1906. Garage, 50 cars. Repairing.

Bullock Electric Mfg. Co.—Cincinnati, Ohio. Mfrs. charging apparatus, electric motors.

Bullock, J. G.—Los Angeles, Cal. (Merkel.)

Bullock, Wm.—Canajoharie, N. Y. Garage.

Bullock, Willis, Jr.—Mgr. The Fixit Shop, Moyer St., Canajoharie, N. Y.

Bulkhead.—One of several partitions in a boat which divide it into water-tight compartments.

Bultman, C. C.—Sec. The F. H. Bultman Co., 2108 Superior Ave., Viaduct, Cleveland, Ohio.

Bultman Co., The F. H.—2108 Superior Ave. Viaduct, Cleveland, Ohio. Mfrs. steering worms and gears, differential gears, sprocket wheels. Cap. \$20,000. Est. 1893. F. H. Bultman, Pres. and Treas.; F. H. Bultman, Jr., Vice-Pres.; C. C. Bultman, Sec.

Bultman, F. H.—Pres. and Treas. The F. H. Bultman Co., 2108 Superior Ave. Viaduct, Cleveland, Ohio.

Bultman, F. H., Jr.—Vice-Pres. The F. H. Bultman Co., 2108 Superior Ave. Viaduct, Cleveland, Ohio.

Bultmann, E. E.—Officer Schaeffer & Budenburg Mfg. Co., Foxboro, Mass.

Bumell, J. C.—Gen. Mgr., Designer and Supt. Outing Boat Co., Kankakee, Ill.

Bump, F. R.—Sales Mgr. H. H. Frank-

lin Mfg. Co., 302 S. Geddes St., Syracuse, N. Y.

Bumping.—A sensation as of running over a succession of small obstacles, produced by a deflated tire in which the air-tube has crept and formed a knot at the valve-tube.

Bunce, A. L.—Sec. and Treas. The Storage Battery Supply Co., 239 East 27th St., New York City.

Bunce, E.—Supt. American Motor Truck Co., Caledonia St., Lockport, N. Y.

Bunce, T. D.—Pres. and Mgr. The Storage Battery Supply Co., 239 E. 27th St., New York City.

Bunker, F. W.—North Anson, Me. (Reo.)

Bunns, John A.—Gen. Mgr. Northwestern Motor Car Co.—1928-1930 N. 20th St., Philadelphia, Pa.

Bunten, Frank L.—318-320 Main St., Canon City, Col. (Maxwell, Rambler.)

Buob & Scheu.—408 E. Court St., Cincinnati, Ohio. Mfrs. wood and metallic bodies, tire cases, auto tops, glass wind shields.

Burbank, Walter C.—Pres. and Gen. Mgr. B. & H. Motor Car Co., 147-151 W. 49th St., New York City.

Burberys.—30 Haymarket, London, England, Mfrs. wearing apparel (coats).

Burchell, Henry Philip.—B. August 4, 1874 at New York City. Educated at public schools of Philadelphia and Columbia University. Present occupation, Sporting Editor, New York Times, Times Bldg., New York City.



Burdick, John.—485 River St., Troy, N. Y. (National.)

Burford, W. D.—227 Main St., La Crosse, Wis. (Lambert.)

Burgener, W. H.—Canton, O. (Jewel.)

Burgess, Frank.—Owner and Prop. Boston Gear Works, Hayward St., Norfolk Downs, Mass.

Burgess & Packard.—Board of Trade Bldg., Boston, Mass. Mfrs. motor boats.

Burghardt Mills Co., Louis.—211-213 W. 82d St., New York City. Garage.

Burgin Bros.—Springfield, Mass. Mfrs. automobile covers, tire cases.

Burke, C. R.—Vice-Pres. Columbia Lubricants Co. of New York. 78 Broad St., New York City.

Burke, O.—918 Larimer St., Denver, Col. Garage.



Photo by Spooner & Wells

Burke, William Wright.—Automobile dealer. B. May 9, 1868, at Oswego, N. Y. Educated at Oswego schools. Mgr. New York branch, the Mora Motor Car co. Member of New York Motor Club, Bay State Automobile Association. Connected with automobile trade since 1901. Owned first car 1901. Recreations, automobile, tennis. Res., 504 W. 113th St. Office, 52d St. and Broadway. New York.

Burkhardt, E. A.—Mgr. Repair Dept. Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y.

Burlap.—A fine fabric made of flax or hemp, used on motor cars as a straining material.

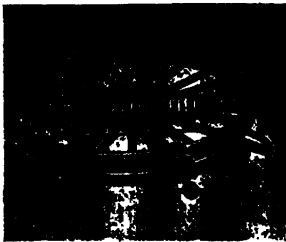
Burlat Frères.—89 bis, cours Lafayette plg., Lyon-Villeurbanne, France. Mfrs. automobile and marine motors.

Burlington Basket Co.—Burlington, Ia. Mfrs. hampers.

Burlington Machine & Repair Co.—166 Church St., Burlington, Vt. (Stanley.)

Burmester Rubber Co.—83 Church St., Boston, Mass. Repairing.

Burner.—For heating the boilers of steam-cars, the fuels most commonly employed are gasoline and kerosene, which are vaporized in a burner based



on the principle of the Bunsen as applied in gasoline stoves. The fuel is supplied from a tank in which is maintained an air-pressure of from 40 to 50 pounds to the square inch by a separate air-reservoir supplied by a pump. After the burner has been lighted, the fuel supply is automatically controlled by the steam pressure, which actuates a needle-valve on the supply-tube. The figure represents a burner of the Ofeldt type.



Burner, Acetylene.—A burner, usually of lava, specially constructed for use on acetylene gas-lamps.

Burner, Bunsen.—A gas-burner of which the central tube is

surrounded concentrically with a cylindrical jacket, in which the ascent of the gas creates a strong draught of air, which, uniting intimately with the burning gas, produces a mixture of high calorific power. These burners were formerly employed for heating the platinum ignition tubes of automobiles, and, in a modified form, are still used on steam-cars, for the heating of tubular boilers. See Burner.



Burnap & Roser.—Canajoharie, N. Y. (Atlas.)

Burnet, J. S.—Sec. and Treas. Universal Storage Battery Co., Offices 108 La Salle St., Factory 36-38 Union Park Pl., Chicago, Ill.

Burnett, L. H.—East Stroudsburg, Pa. (Holsman.)

Burney Bird Auto Co.—319 Wabash Ave., St. Paul, Minn. (Haynes, Mitchell.)

Burnham Geo. Co., The.—Worcester, Mass. Mfrs. tools.

Burnham, Geo. E.—Vice-Pres. Avery Portable Lighting Co., 18-22 Martin St., Milwaukee, Wis.

Burnham-Standeford Co.—Oakland, Cal. Mfrs. portable houses.

Burns Automobile Co.—31 Grant Sq., Brooklyn, N. Y. Garage.

Burning Back.—The ignition of the gas within the mixing chamber of a steam carriage burner of the Bunsen type. It is generally caused by a sudden gust of wind, and has the effect of cutting off heat from the boiler and producing a fall of steam pressure.

Burning On.—A process of adding a fresh part to an injured or incomplete casting.

Burns, Bert A.—Narragansett, R. I. Garage.

Burras, C. H.—Director Austin Automobile Club, Austin, Ill.

Burr, E. L. & A. M.—Rockford, Ill. (Waltham.)

Burrell, J. C.—Gen. Mgr. and Designer Outing Boat Co., Kankakee, Ill.

Burrill, C. F.—Head of Automobile Dept., S. L. Crosby & Co., 186 Exchange, Bangor, Me.

Burrington Motor Co.—24 Suffolk St., Holyoke, Mass. (Stoddard Dayton, Maxwell.)

Burris, James H.—Treas. The Auto Shop Co., 731 Vincent Ave. N. E., Cleveland, Ohio.

Burrowes, E. F.—Pres. Curtain Supply Co., 85-93 Ohio St., Chicago, Ill.

Burrows Co., E. T.—Portland, Me. Mfrs. drip pans, foot rests.

Burt, H. B.—25 N. Phelps St., Youngstown, Ohio. (Waltham.)

Burtis & Son.—18 Jay St., Schenectady, N. Y. Garage.

Burton, Reeves.—Freeport, Ill. Garage.

Burt & Co.—346 Halsey St., Newark, N. J. Garage

Burt Mfg. Co.—128 N. Edward St., Kalamazoo, Mich. Mfrs. gasoline automobile motors, timers.

Burwell, A. Jr.—7 W. 5th St., Charlotte, N. C. (Rambler.)

Burwell, G. B.—Supt. Olds Motor Works, Lansing, Mich.

Bus-bar.—A bar or rod for carrying a heavy current produced by a powerful electric source. An abbreviation of "omnibus bar," so called because it carries the whole current from one source or the current from all the electric sources with which it is connected.

Bush Bros.—Cor. Ohio and South Sts., Sidney, Ohio. (Reo.)

Bushfield, Wm. A.—Pres. and Mgr. American Veneer Co., Kenilworth, N. J.

Bushfield, Wm. H.—Sec. American Veneer Co., Kenilworth, N. J.



Bushing.—A lining of anti-friction or other metal for a bearing, in the form of a ring or of a hollow cylinder, in a single piece or divided in halves.

Bush, John J.—Partner in firm, National Auto Top Co. Main office 1904 Broadway, factory 244-250 W. 49th St., New York City.

Bushwick Garage.—58-62 Palmetto St., Brooklyn, N. Y. Garage.

Bush, Wm. E.—953 S. Main St., Los Angeles, Cal. (Pierce Arrow, Napier.)

Busick, C. J.—Sec. Mica Mfg. Co., 307 W. Broadway, New York City.

Bus.—An abbreviation of "omnibus," used in combination with other words as a designation for certain types of motor-vehicles for public conveyance, as "auto-bus," "motor-bus."

Bus-pipe.—A large pipe of round or square section for the conveyance of air or gases. An abbreviation of "bustle-pipe," a term borrowed from blast-furnace practice. See Manifold.

Busse, N. G.—479 Sumner Ave., Brooklyn, N. Y. Repairing.

Bussing, H.—Elmstrasse, Braunschweig, Germany. Mfrs. automobiles, gas, comm.

Bustle-pipe.—In a blast-furnace, an air-conduit. See Bus-pipe.

Butler Auto Co.—Hamilton, Canada. (Pope-Toledo.)

Butler, F. C.—Sec. Cook's Standard Tool Co., Kalamazoo, Mich.

Butler Motor Car Co.—Copley St.; garage, Harcourt St. side, Boston, Mass. (Cleveland, Pierce-Racine, Rapid.)

Butler, Samuel McKnight.—B. Dec. 13, 1866 at Camden, N. J. Educated at

public schools. Present occupation sec-



retary of the Automobile Club of America. Member and first secretary of Aero Club of America. Formerly, Asst. Sec. of Automobile Club of America, Oct., 1899. Owner of car and motor boat. Made balloon ascension in "Le Centaur" Nov. 3,

1906, 137 miles, Pittsfield to Long Island Sound. Military service, 12 months, with 1st Signal Corps, U. S. Army in Cuba. Residence, 58 Elm St., New Rochelle, N. Y. Office, 54th St., west of Broadway, New York City.

Butler, T. J.—Harrison Ave. and 5th St., Harrison, N. J. (Cadillac.)

Butrey, James.—Valley City, N. D. Garage.

Butt.—A joint formed by the planks in the strakes of a boat

Butterfield, William W.—Sec. Racine Boat Mfg. Co., Riverside, Muskegon, Mich.

Butterfield, H. K.—Pres. Kissel Motor Car Co., Hartford, Wis.

Butterfly-valve.—See Valve, Butterfly.

Butt, Joint.—See Joint, Butt.

Button, Push.—A button which, when depressed, opens or closes an electric circuit.

Butts, A. M.—246 Main St., Oneonta, N. Y. (Elmore.)

Butts, C. W.—Goddell, Ia. (Holzman.)

Butzer, John S.—Washington Ave., Ephrata, Pa. (Maxwell, Reo, Rambler.)

Buxton, Bronson C.—Sec. and Treas. Walden W. Shaw Co., 1532-1534 Michigan Ave., Chicago, Ill.

Buxton, W. B.—Mgr. Garage Dept. Park Sq. Auto Station, 43 Columbus Ave., Boston, Mass.

Buzby, Geo. H.—Vice-Pres. Cycle & Automobile Trade Journal, 1213 Filbert St., Philadelphia, Pa.

Buzzer.—The same as trembler or vibrator q. v.

Byers & Co., A. M.—Pittsburg, Pa. Mfrs. wrought iron and steel pipe.

By-pass.—A pipe or channel passing around a valve and allowing some fluid to flow by or out of the valve-chamber, although the valve is closed. A passage-way from the crank-chamber to the cylinder, through which the gas passes.

Byrne, C. T.—Treas. Byrne, Kingston & Co. Pres. Kokomo Electric Co., 339-351 Smith St., Kokomo, Ind.

Byrne, John T.—Pres. Auto Rail & Equipment Co., 113 Michigan Trust Bldg., Grand Rapids, Mich.

Byrne, Kingston & Co.—339-351 Smith St., Kokomo, Ind. Mfrs. car-

buretors, mufflers, pumps. Member M. & A. M. Cap. \$50,000. Est. 1902. Geo. Kingston, Pres.; J. F. Ryan, Vice-Pres.; J. W. Johnson, Sec.; C. T. Byrne, Treas.

C

C.—An abbreviation of "centigrade degree."

C.—Symbol for "capacity" and "coulomb."

C.—Symbol for "carbon"; Ca. for "calcium"; Cd. for "cadmium"; Cr. for "chromium"; Cu for "copper."

C. G. S.—Abbreviation of "centimetre-gramme-second."

C. G. S. System.—An abbreviation of "Centimetre-Gramme-Second," a system of units which has been universally employed in physics since 1881, for facilitating and unifying calculations, and which takes the centimetre (C) for the unit of length, the gramme (G) for the unit of weight, and the second (S), the unit of time. The principal units of the C. G. S. are: the "dyne," "erg," "joule," "farad," "coulomb," "ampere" and "volt."

Cab.—An enclosed four-wheeled vehicle with a single seat for two. One variety has an additional seat or rumble placed either in front of the single seat or at the rear and above the seat ("hansom cab.") The entrance is from the front, and the control is from the seat, all pedals, etc., being placed there. The motor is placed in front under a hood, as in ordinary practice.

Cabana, Martin, J.—Sec. G. A. Hosmer Co., 601-607 Northland Ave., Buffalo, N. Y.

Cabana, Oliver, Jr.—Pres. and Treas. G. A. Hosmer Co., 601-607 Northland Ave., Buffalo, N. Y.

Cable.—A heavily insulated wire or set of wires; often protected from injury by a very strong covering; used to convey large currents for lighting and power, or for the small currents required in telegraph or telephone work. (2) A stout rope of either hemp or steel. The name is applied also to a chain, especially that to which the anchor of a vessel is attached.

Cable-length.—In mariner's measurement, a "cable-length" is 100 fathoms, or 600 feet.

Cabot, E. J.—Pres. and Mgr. The DeWitt Auto Co., 248-250 W. 80th St., New York City.

Cachat & Co., C. M.—1718 Crawford Rd., Cleveland, O. Repairing.

Cadillac Automobile Co.—364 E. Market St., Indianapolis, Ind. (Cadillac.)

Cadillac Automobile Co. of Illinois.—1312 Michigan Ave., Chicago, Ill. (Cadillac.)

Cadillac Auto Station.—Wyomissing, Pa. Garage.

Cadillac Company of Dutchess Co.—Red Hook, N. Y. (Cadillac.) Est. 1905. Branches at Poughkeepsie and Kingston, N. Y.

Cadillac Motor Car Co.—265 Jefferson Ave., Detroit, Mich. Retail Dept. of Cadillac Motor Car Co. Est. 1905. Garage, 30 cars. Repairing.

Cadillac Motor Car Co.—1343 Cass Ave., Detroit, Mich. Makers of the Cadillac car. First marketed 1902, 11 different models made since. Cap. \$1,500,000. Lem W. Bowen, Pres.; C. A. Black, Vice-Pres.; Wm. H. Murphy, Treas.; W. C. Leland, Sec.; H. M. Leland, Gen. Mgr. Retail salesrooms 265 Jefferson Ave., Detroit, Mich.

Cadmium.—A white metal with a bluish tinge melting at 500° Fahr. (260° C.). It has properties very similar to those of zinc and forms a constituent of fusible metals, and of an alloy for bearings. It is employed for forming certain standard batteries and is utilized also in the form of sulphate in cadmium accumulators. Cadmium alloy for bearings consists of cadmium 45 parts, zinc 45 parts, antimony 10 parts.

Cadmus, Ernest H.—Treas. Central Motor Car Co., Bloomfield, N. J.

Cadogan Motor Co.—102 Sydney St., Chelsea, London, England. Mfrs. automobiles, gas, comm. (Cadogan.)

Caffort Frères.—125 bis, rue du chemin Vert, Paris, France. Mfrs. transmission gears.

Caffrey, A. R.—Sec. M. Caffrey Leather Co., Frelinghuysen Ave. and Meeker St., Newark, N. J.

Caffrey Leather Co., M.—Frelinghuysen Ave. and Meeker St., Newark, N. J., Mfrs. leather for tops, cushions and dashes. Cap. \$100,000. Est. 1879. Thos. F. S. Kearns, Pres. and Treas.; Mathew J. Caffrey, Vice-Pres.; A. R. Caffrey, Sec.

Caffrey, Mathew J.—Vice-Pres. M. Caffrey Leather Co., Frelinghuysen Ave. and Meeker St., Newark, N. J.

Cagno, Emilio.—B. in Milan, Italy, Sept. 5, 1879. A well-known driver of racing cars, winner of the Florio cup race in Sicily in 1906, driving an Itala car. Competed in the 1906 Vanderbilt cup race and was in seventh place on the ninth lap, but was called off before finishing.

Was at one time chauffeur for the Queen of Italy.

Cahen, Emile.—7 Avenue Niel, Paris, France. Born at Paris, Dec. 31, 1862. Chevalier of the Legion of Honor, officer of the Academy, former general manager of the Mors Society, laureate of the Institute, State engineer of manufactures. In conjunction with M. Serené he invented the S. C. matches without white phosphorus, and the S. C. machine for the continuous manufacture of

matches. He is consulting engineer and chief of the automobile service of the General Carriage Company of Paris.

Cahill Automobile Co.—1318 L. St., N. W., Washington, D. C. (Waltham.)

Cailleau et Cie.—20 rue des Walloons, Liege, Belgium. Mfrs. lubricators.

Caille Bros. Co., The.—2d Ave. and Amsterdam St., Detroit, Mich. Mfrs. gasoline marine motors.

Caillois, Gustav.—A French designer and racing man. He won the Gaillon hill climb in 1902 and was fifth in the Bennett cup race of 1904, driving a Brasier car. In 1906 he was a competitor in the Vanderbilt cup race, but did not finish. He had previously been retained by the E. R. Thomas Motor Co. as consulting

engineer, and in the spring of 1906 he came to America with Herbert Le Blon and superintended the designing and building of the two Thomas Vanderbilt

cup racers, which were driven by Le Blon and himself in that contest.

Cain, A. H.—Roodhouse, O. Repairing.

Cain, Frank.—202 4th Ave., Detr it, Mich. Mfrs. vulcanizers.

Calcium Carbide.—A chemical compound of carbon and calcium (CaC_2). It is produced commercially in the electric furnace. By the action of water it is decomposed into lime and acetylene gas, a very brilliant illuminant. See Acetylene.

Calcium Carbonate.—An amorphous white powder (CaCO_3) very sparingly soluble in pure water, and much more soluble in water containing carbon dioxide. Most well-water and sometimes river-water holds in solution a certain proportion of carbonate of lime, which, through boiling, deposits as a hard crust on the sides of the containing vessels, such as the water jacket of motors and the tubes of radiators and steam boilers. See Scale and Fur.

Calcium Chloride.—A white, deliquescent chemical (CaCl_2) much employed in solution as an anti-freezing agent in the cooling systems of water-cooled gas motors. This chemical, unlike common salt, will not rust or corrode metal of any kind. It dissolves very readily in water, of which it is a great absorbent. Its freezing point is many degrees below that of salt, the brine of which freezes at zero, while calcium brine has a maximum freezing point of 54°F . below zero.

Caldwell Co.—136 S. 14th St., Philadelphia, Pa. Mfrs. brake bands, brass, bronze, aluminum and copper castings.

Calgary Garage Co.—709 Centre St., Calgary, Alberta, Canada. (Rapid, Reo, Oldsmobile. Pope-Waverly.)

Calhoun, J. Edward.—Pres. and Director Dragon Motor Co., 31st, 32d and Chestnut Sts., Philadelphia, Pa.

Calibration.—A determination of the correct value of the graduation of a scale or some measuring instrument; or a determination of the dimensions of an object which is to be used as a standard of measurement. "Calibrated" is said of an instrument or scale graduated so that its action or readings shall be correct, particularly if the graduation is the result of tests rather than that of calculation.

California Automobile Co.—1224 Webster St., Oakland, Cal. (Maxwell, Mitchell.)

California Automobile Co.—318 E. Market St., Stockton, Cal. (Mitchell.)

California & Nevada Auto Co.—1363 Bush St., San Francisco, Cal. (Stearns.)

California Women's Automobile Club—San Francisco, Cal.

Caliper.—A tool for measuring the internal or external diameter of objects.

Two varieties, called "inside" (Fig. 1) and "outside" (Fig. 2) calipers, are commonly used.



Fig. 1

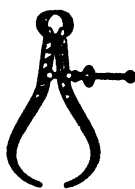


Fig. 2

Caliper, Micrometer.—An instrument of high precision, called also a "micrometer gauge," which is employed for measuring minute thicknesses and in particular the thickness of sheet metal, etc.

Callaghan, A. J.—Sec. and Gen. Mgr. American Oil Co., 170-178 S. Water St., Jackson, Mich.

Callahan, A. H.—Pres. Universal Electric Storage Battery Co. Office 108 La Salle St.; factory 36-38 Union Park Place, Chicago, Ill.

Callahan, Atkinson & Co.—1020 Morton St., Baltimore, Md. (Locomobile Pope Toledo, Pope-Hartford.)

Callanan & Hogg.—Parkersburg, W. Va. (Cadillac.)

Calman, Emil.—299 Pearl St., New York City. Mfr. varnishes.

Caloric.—A term formerly used to denote "heat," which was at one time supposed to be an imponderable, elastic fluid.

Calorie.—The unit of heat, called the "thermal unit," generally employed for comparison in scientific work. It is the quantity of heat required to raise the temperature of one gramme of water through 1 degree Centigrade. A "great caloric" is a thousand times this. These units of heat are often referred to as a gramme-degree Centigrade and a kilogramme degree Centigrade respectively. The pound-degree Centigrade, which is the quantity of heat necessary to raise one pound of water through one degree Centigrade, is often convenient to use. For very accurate work it is necessary to specify the exact temperature at which the water is taken. The temperature most usually agreed upon is 40° Centigrade, but other temperatures have from time to time been used. "Calorific value," the measure of the amount of heat obtainable from a given weight of fuel, is usually found by direct experiment, the fuel being completely burnt and the heat evolved measured by some form of calorimeter.

The following are, in round numbers, the number of calories disengaged by the combustion of 1 kilogramme of the principal fuels used for carburetion in internal combustion motors: Pure alcohol,

7,000 calories; denatured alcohol, 6,000 calories; carburetted alcohol, 7,000 to 8,000 calories; sulphuric ether, 8,000 calories; benzole, 10,000 to 11,000 calories; gasolene, 11,000 to 12,000 calories. See Calorimeter.

Calorimeter.—An instrument for measuring the quantity of heat given out by bodies in passing from one temperature to another. In its commonest form it consists of a thin metal vessel in which a known mass of water is placed. The rise or fall in temperature of this liquid, due to the introduction of a hot or cold body, is observed by means of a thermometer. The vessel is usually protected from loss or gain of heat through radiation by means of an outer vessel.

Calthorpe Motor Co., Ltd.—81 John Bright St., Birmingham, England. Mfrs. automobiles, gas. (Calthorpe.)

Calumet Auto Co.—116 E. 29th St., Chicago, Ill. Garage.

Calvert-Zusi Auto Co.—215 Clinton Ave., Newark, N. J. (Winton.)

Cam.—A metal disk with a projection (called a "cam-head" or "nose"), on its periphery which strikes a tappet and converts rotary into a desired irregular motion. It is mounted on a shaft called a "cam-shaft" and actuates the valve mechanism. The figures show the types in general use for lifting the inlet and exhaust valves of gasolene motors.

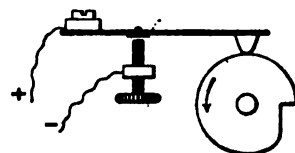


Cam, Edge.—A cam designed to give a variable motion in a direction parallel with the shafts on which it is mounted.

Cam, Exhaust.—A cam designed to lift the exhaust valve. See Cam.

Cam-gear.—The mechanism employed to drive a cam-shaft.

Cam-head.—See Cam.

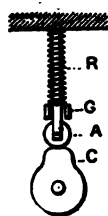


Cam, Ignition.—A cam for actuating a contact-breaker or analogous device in an ignition system. See Cam and Contact-breaker.

Cam, Inlet.—A cam that actuates an inlet-valve. See Cam.

Cam-nose.—The projection on a cam-disk which lifts the part to be operated upon. See Cam-head.

Cam, Reversing.—A valve-cam which is so arranged that, by reversing its motion, it will cause a motor to reverse.



Cam-roller.—A small steel wheel, A (see figure), mounted at the lower end of a valve push-rod, R, and which, through the action of the cam-head, C, lifts the rod and, through it, the valve and its stem.

Cam-shaft.—A shaft revolving at half the velocity of the crank-shaft, and actuating the valve-mechanism through the medium of the "cam-gear," called also a half-time shaft.

Camshaft, Overhead.—In a gas-motor a camshaft situated above the cylinders, near the valves, instead of alongside of the crankcase.

Cam, Snap.—A cam which, once in a revolution, brings together the terminals of a sparking circuit. See Cam, Ignition.

Camber.—A general term for the amount of curvature of some object; as the downward bend of an axle designed to tip the wheels inward at the bottom and give them an outward direction at the top, the upward curvature of a boat's deck amidships, etc. To camber is to curve a piece of wood by fire or other means.

Cambered Frame.—See Frame, Cambered.

Cambered Road.—See Barrelled Road.

Cambon fils. — Rozières-sur-Mouzon, Vosges, France. Mfrs. ball bearings.

Cambria Forge Co.—Cleveland, Ohio and Johnston, Pa. Mfrs. axles, crank shafts, drop forgings, steering apparatus, steering wheels, universal joints, valve stems.

Cambria Steel Co.—440 Ellicott Sq., Buffalo, N. Y. Mfrs. steel.

Cambridge Auto Co.—Cambridge, Md. Garage.

Camden Anchor-Rockland Machine Co.—Camden, Me. Mfrs. marine and Stationary gasoline engines, bronze propellers, carbureters, anchors, hoists, motorboats. Cap. \$300,000. Est. 1901. John Bird, Pres. and Mgr.; A. D. Bird, Treas.; E. P. Lamb, Supt.

Camden Auto Exchange.—58-60 N. 2d St., Camden, N. J. (Dragon.)

Camden Auto Supply Co.—437 Broadway, Camden, N. J. (Dragon.)

Camel-hair.—A kind of yarn composed of wool and hair and used in the weaving of driving-belts.

Cameron Auto Co.—313-315 Commerce St., Dallas, Tex. (Buick, Franklin. Pope Toledo.) Est. 1905. Not inc. B. L. Cameron, Gen. Mgr. Garage. 34 cars. Repairing.

Cameron Car Co.—Brockton, Mass. Mfrs. automobiles, gas. (Cameron cars.)

Cameron Motor Car Co.—923 S. Main St., Los Angeles, Cal. (Cameron.)

Cameron Motor Car Co.—303-305 N. 15th St., Philadelphia, Pa. (Cameron.)

Cameron, R. L.—Gen Mgr. Cameron Auto Co., 313-315 Commerce St., Dallas, Tex.

Camp, L. W.—Akron, Ohio. (Haynes.)

Campistrou, Jean Maxime.—68 rue Marjolin, Levallois, Seine, France. Mfrs. pressed steel frames.

Campagné, E.—45 blvd. de Belleville, Paris, France. Mfrs. automobiles, gas, comm. (Lacoin fore-carriage.)

Campana, John M.—Post Rd., Port Chester, N. Y. Garage.

Campbell.—24 passage du Havre, Paris, France. Maps, touring routes.

Campbell & Co., C. G.—St. Albans, Vt. (Pope-Hartford.)

Campbell Auto Co.—1st and Adams St., Marion, Ind. (Cadillac, Winton, Autocar.) Vulcanizing and tire repairs.

Campbell Auto Co.—612 Mulberry St., Des Moines, Ia. and 508 Central Ave., Ft. Dodge, Ia. (Reo, Rambler, Mason.) Est. March, 1907. Cap. \$5,000. I. R. Campbell, Pres.; Norlan Snow, Sec. and Treas. Garage, 15 cars. Repairing.

Campbell, A. R.—Morrisville, Vt. (Maxwell.)

Campbell, A. V.—Kalamazoo, Mich. Garage.

Campbell, Chas. M.—Pres. Pope Automobile Company of Washington, 817-819 14th St., N. W., Washington, D. C.

Campbell Bros.—Danville, Ill. (Pope Toledo.)

Campbell-Corwin Co.—902 Union St., Brooklyn, N. Y. (Du Luxe.)

Campbell, F. J.—Advt. Mgr. Aerocar Motor Company, Mack and Beaufait Aves., Detroit, Mich.

Campbell, England & Markscheffe.—Colorado Springs, Col. (Peerless, Franklin, Oldsmobile, Columbus.)

Campbell Garage, The.—47 St. Louis St., Quebec, Canada. Supplies. Garage.

Campbell, I. R.—Pres. Campbell Auto Co., 612 Mulberry St., Des Moines, Ia. and 508 Central Ave., Fort Dodge, Ia.

Campbell, James.—455 Jackson Blvd., Chicago, Ill. Garage.

Campbell, J. F.—Sec. and Treas. Dayton Motor Car Co., Dayton, O.

Campbell Motor Co.—Wayzata, Minn. Mfrs. gasoline, marine motors.

Campbell, Robert.—Pres. American Oil Co., 170-178 S. Water St., Jackson, Mich.

Campbell, T. V.—Galena, Kan. Garage.

Campbell, W. E.—Pres. Direct Drive Axle, Co., 575 N. 4th St., Columbus, O.

Camp, Grover.—Vice-Pres. Sterling Motor Car Co., 180-184 Water St., Binghamton, N. Y.

Canada Cycle & Motor Co.—145 Bay St., Toronto, Canada. (Russell.)

Canada Standard Automobiles, Ltd.—124 Bay St., Toronto, Ont. (Peerless.)

Canadian Automobile Co.—342 Craig St., W. Montreal, Canada. (Oldsmobile. Cadillac.)

Canadian Cycle & Motor Co., Ltd.—Ottawa, Canada. (Russell.)

Canadian Electrical News and Engineering Journal.—Confederation Life Bldg., Toronto, Ont., Can. Pub. monthly by the C. H. Mortimer Pub. Co.

Canadian Motor, The.—1 Wellington St., W., Toronto, Ont., Can. Pub. monthly by The Vehicle Pubs., Ltd.

Candle-power or Standard Candle.—A unit of illumination based on the consumption of a sperm candle of 120 grains (about 7.8 grammes) of wax per hour. This, termed "the candle-power," is used in the determination of the illuminating power of other sources of light. Another unit, the light emitted by a square centimetre of melted platinum at the moment of solidification, is equal to about 15 standard candles.

C. and C. Electric Co.—143 Liberty St., New York City. Mfrs. electric motors.

Canfield Auto Station.—Canaan, Conn. (Knox, Stevens-Duryea, Waltham.) Est. 1905. W. H. Canfield, Mgr. Garage, 10 cars. Repairing.

Canfield, W. H.—Mgr. Canfield Auto Station, Canaan, Conn.

Canon City Automobile Club.—Dr. Otis Orendorff, Sec., Canon City, Colo.

Canonsburg Iron & Steel Co.—Pittsburg, Pa. Mfrs. sheet iron and steel.

Canopy or Canopy-top.—A non-folding top for a motor-car.

Cant.—An obtuse angle. (2) A slope, tilt or inclination.

Cantieri Automobilistichi Riuniti.—6 via Luigi Galvani, Palermo, Italy. Mfrs. automobiles, gas. (C. A. R. cars.)

Cantono.—13 Viale Paroli, Rome, Italy. Mfrs. automobiles, elect comm. (Cantono fore-carriage.)

Cantono Garage.—111 W. 37th St., New York City. (Cantono Electric.) Garage.

Cant-timber.—One of the timbers situated at the end of a vessel, and that rise obliquely from the keel.

Caoutchouc.—The same as india-rubber, q. v.

Cap.—A general term for a cover used to protect working parts from dirt or dust.

Capacity.—Ability to absorb or retain, as heat, electricity, etc.

Capacity, Calorific.—The quantity of heat which a body absorbs when its temperature rises through a given range, say from zero to 1°, compared with the quantity of heat which would be absorbed, under the same circumstances, by the

same weight of water; that is, when water is taken as the standard for comparison of specific heats.

Capacity, Cylinder.—See Cylinder-capacity.

Capacity, Electrical.—The quantity of electricity required to charge a conductor up to a unit potential; or, in other words, the ratio of the charge in a conductor to its potential.

Capacity, Storage-cell.—The "capacity" of a storage-cell, which depends on the number and size of the plates, is measured in terms of ampere-hours. Thus, if we say that the capacity of a cell is 100 ampere-hours, we mean that it can supply 1 ampere for 100 hours, 2 amperes for 50 hours, 5 for 20, and so on.

Cape Ann Tool Co.—Granite St., Pigeon Cove, Mass. Mfrs. drop forgings. Cap. \$16,000. Est. 1891. Inc. 1905. Edwin Hawkridge, Pres.; J. F. Hawkridge, Vice-Pres.; J. Judson Deane, Treas. and Gen. Mgr.

Cape Apron.—See Apron, Cape.

Cape May Automobile Club.—J. Hiscock, Sec., 438 S. Penn. Sq., Philadelphia, Pa.

Capen Motor Car Co.—4739 McPherson Ave., St. Louis, Mo. (Locomobile.)

Capillarity.—The peculiar form of adhesion which is exhibited between a liquid and a very small tube containing it; likewise between two plates placed very close together, and, generally speaking, whenever the surfaces of two walls are in close proximity. The effects of capillarity are diametrically opposite, according as the liquid wets or does not wet the walls. In the first case, there is an elevation (attraction) and, in the second, a depression (repulsion) of the liquid. The first is realized with water, and the second with mercury. Capillary elevation or depression depends upon the nature of the liquid and the wall, but all else being equal, it varies as the inverse of the square of the diameter of the tube. Examples of capillary ascension are found in lamps, wick-carburettors, wick-lubricators, etc.

Capital Auto Co.—Indianapolis, Ind. Mfrs. jacks, auto tops, glass wind shields.

Capitol Auto Co.—N. Y. and Massachusetts Ave., Indianapolis, Ind. (Wayne, Reo, Jackson, Overland.)

Capitol Auto Co.—313 Michigan Ave., Lansing, Mich. (Premier, Reo.)

Capito Carriage Co.—1201 S. Main St., Los Angeles, Cal. (Aerocar.)

Capital City Auto, Hack & Livery Co.—176 Allyn St., Hartford, Conn. (Mitchell.)

Capital City Automobile Co.—167 Peachtree Ave., Atlanta, Ga. (Buick, Columbia, Peerless, Cadillac, Franklin.)

Capital City Automobile Works.—22 Plain St., Albany, N. Y. Garage.

Capital City Garage.—Perry St., Montgomery, Ala. (Buick, Waltham.)

Capital City Garage.—32 Chauncery St., Trenton, N. J. Garage.

Capital City Motor Co.—904 Market St., Harrisburg, Pa. (Lambert.)

Capitol Foundry Co.—Hartford, Conn. Mfrs. gray iron castings.

Capital Garage.—1719 Capitol St., Cheyenne, Wyo. (Reo, Premier, Gale, Franklin, Buick, Mora, American.)

Capital Garage.—337 Water St., Augusta, Me. Supplies. Garage. Repairs.

Capitol Hill Auto Co.—Pine and Broadway, Seattle, Wash. (Mitchell, Rambler.) Garage. Repairing.

Capitol Hill Garage Co.—615 B St., S. E., Washington, D. C. (Mitchell, Rambler and second-hand cars of all kinds.) Est. July, 1906. Not inc. James J. Flynn, Owner; Roger L. Flynn, Mgr. Garage, 20 cars. Repairing.

Capital Machine & Auto Co.—St. I. bet. I and J Sts., Sacramento, Cal. (Ford, Soules.)

Caplin, G. W.—424 5th St., Minneapolis, Minn. (Royal Tourist.)

CapPELLI e Ca.—Corso Cavour, Brescia, Italy. Mfrs. bodies.

Capra, M.—7 ave de Taillebourg, Paris, France. Mfrs. motorcycles.

Capron, J. H.—Ord, Neb. (Carter-car.)

• **Cap-screw.**—See Screw, Cap.

Caps, John.—Repair Dept. E. P. Moriarty & Co., 1612-1614 Grand Ave., Kansas City, Mo.

Capstan.—A machine whereon a boat's cable is wound in "weighing" anchor.

Car.—That part of a balloon or other apparatus for aerial navigation in which the aeronaut rides. (2) In automobilism, a general term for a vehicle of a type which, when horse-drawn, is called a "carriage."

Car, The.—168 Picadilly, London, W., England. Pub. weekly.

• **Carbide.**—The same as calcium carbide, q. v.

Carbide, Candy.—A preparation of calcium carbide having the property of regulating the action of water on the carbide in such a way as to render the production of acetylene slower and more uniform. See Acetylite.

Carbon.—An element with atomic weight 12, which is met with in three allotropic states, viz.: that of "crystalline carbon," or diamond; of "graphatoid carbon," or graphite, and of "amorphous carbon," in the form of charcoal, lamp-black, soft coal, anthracite, coke, etc. Carbon enters in inorganic chemistry, into the composition of innumerable compounds: hydrocarbons, alcohols, sugars, starches, cellulose, etc. It combines

with oxygen to form carbonic oxide, CO, and carbonic dioxide or carbonic acid gas, CO₂. It combines also at very high temperatures, directly with silicium, to form crystalline silicide of carbon, which has been much employed in the last few years as an abrasive under the name of "carborundum." q. v.

Carbon plays an important part in the automobile industry. In fact, the steel employed in almost all parts of the car is the result of a combination of iron and carbon; and, moreover, it supplies internal combustion motors with fuel in the form of gasolene, which is a hydro carburet, that is to say, a combination of hydrogen and carbon.

It forms the positive electrode in nearly all commercial forms of dry and primary batteries, and is used also for making brushes or current-distributers for both dynamos and electric motors. See Coke and Graphite. (2) A trade-name for naphthalene. q. v.

Carbon, Bisulphide.—A colorless, highly refractive liquid, CS₂, having a very offensive odor. It is largely used as a solvent for many substances, and particularly for india rubber to form "rubber cement."

Carbon, Gas.—A dense form of pure carbon found lining the retorts in coal-gas making. It is sometimes called "artificial graphite" and is used in making the carbon poles of primary cells and the carbon electrodes in arc lamps.

Carbon Monoxide.—A colorless gas formed by the imperfect oxidation or combustion of carbon or coal or carbonaceous substances under the action of oxygen or atmospheric air. Symbol CO. It is extremely poisonous and acts upon the human economy through the respiratory tracts. It is so much the more dangerous in that it is odorless and insipid and that its presence in the surrounding air is not perceptible to the senses. For this reason care should be taken to avoid the inhalation of gas from the exhaust-pipe which is almost always more or less charged with this dangerous gas.

Carbonado.—A very hard form of carbon, from Brazil. It is used for truing up emery-wheels.

Carbondale Chemical Co.—Carbondale, Pa. Mfrs. anti-freezing solutions.

Carbonize.—To charge with carbon, as in the cementation of steel. See Cementation.

Carborundum.—A silicide of carbon, SiC, which is used as an abrasive, and is exceeded in hardness only by the diamond. It is produced artificially at Niagara Falls by the action of a powerful electric current on a mixture of silicious sand and carbon.

Carborundum Co., The.—Buffalo and 18th Sts., Niagara Falls, N. Y. Mfrs. emery wheels.

Carburetted Air.—Air to which a certain proportion of the vapor of gasoline, alcohol, etc., has been added in order to form an explosive mixture.

Carburetter.—An apparatus in which is effected the mixing of the fuel necessary for the operation of internal combustion motors. Such mixture is composed of atmospheric air and the vapors of a liquid hydrocarbon in proper proportions. In order that it may give the best results, a carburetter should furnish an accurately proportioned mixture, that is to say, one containing just the proportions of fuel required, and, moreover, containing such fuel as nearly as possible in the state of vapor. Classified according to structure and operation, there are three classes of these apparatus, viz.:

(1) The "surface" carburetter, in which the engine suction draws the air over the surface of the gasoline. The air then becomes heavily charged with gasoline vapor, and, in its passage to the inlet-valve, is again diluted with more air in such proportions as to give the best "explosive" result.

(2) The "float feed" or "spray" carburetter, in which the principle is evenly to divide the spirit so that it presents a maximum amount of surface to the incoming air, and is capable of being held in suspension in the air-current during the short time necessary for the transformation from the liquid to the gaseous state. There are various ways of accomplishing this object; but, in most cases, the result is that a continual flow of air issues from a conical nozzle and creates a vacuum in the central portion of the flow, thus causing the suction of the motor to draw the air through a contracted tapered passage, over a nipple having a very fine aperture, or series of apertures. The vacuum produced by the rush of air causes the gasoline to issue in the form of a finely-divided spray, which, in meeting the current of induced air, is immediately vaporized and carried over to the motor-cylinder, after being mixed with a quantity of additional air admitted to the aperture in the up-take of the carburetter.

(3) The "ebullition" or "filtering" carburetter, in which the air is drawn by suction, through the liquid mass, so that it bubbles up through the liquid and escapes at the surface. Of these types, only the two first have been widely used with motor-car engines.

One of the earliest forms of the first was brought out for the early motor-cycles and is shown in Fig. 1. The gasoline is poured into the containing vessel and lies in the lower part. The

current of air is drawn down through the inlet, A, so that, underneath the plate, B, it spreads itself over the surface of the gasoline and picks up the vapor which rises to the surface. The level of the

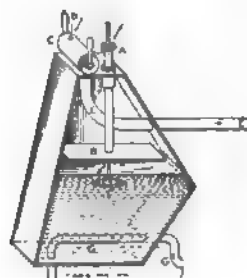


Fig. 1.

plate, B, may be adjusted as that of the liquid varies. The volatility of the gasoline may be increased by passing hot exhaust gas through the tube, G, and out into the exhaust pipe at G'. The carburetted air rises through an opening at the top of the carburetter into the chamber, C, which is called the "twin-tap." The carburetted air meets an additional supply of air from outside through an aperture in C, which can be controlled by a lever (not shown). This control can be made to vary the proportion of fuel and air that passes through a conduit in the "tap," C, into the pipe, E, which delivers the mixture in explosive proportions to the motor-cylinder.

In the third, the filtering carburetter, the type originally used by Daimler, the mixture of the liquid with air takes place by way of evaporation, and all the improvements employed have been de-



Fig. 2.

signed to better the conditions under which such evaporation is effected by putting the liquid into contact with the air over the greatest surface possible. Fig. 2 gives an idea of such a carburetter. A porous cylinder, a, becomes saturated with the liquid into which its base dips. The air enters through circular orifices, b, becomes charged with combustible vapors in "licking" the wet surface, and goes to the motor through C. An additional air in-take, not shown in the figure, permits of correcting the proportioning of the mixture. The apparatus of the second class, the "float-feed" or "spray" carburetter, is now the prevailing type. Its chief advantage is that it can be adjusted to use gasoline or alcohol of any density, or even paraffine, after preliminary warming, for a few minutes on gasoline. The worst fault with this carburetter, unless it is provided with an auxiliary air-inlet, is that it will not generate the mixture in constant proportions at varying speeds; giving too rich a mixture at high speeds, which, if corrected, renders the mixture

weak at low speeds. The faster the air passes the jet, the greater will be the suction effect, so that when the motor increases its speed, the proportions of the mixture are apt to be altered. The speed of the air should be from 80 to 100 feet per second.

In principle, the apparatus consists of a spraying or "atomizing" nozzle, A (Fig.

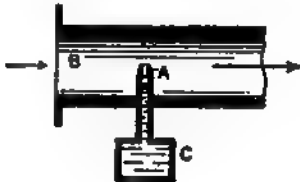


Fig. 3.

3), of which the upper orifice debouches in the center of the suction-tube, B. The latter opens in the surrounding air, and the spraying nozzle is supplied with fuel by communication with a receptacle in which the level is maintained by a float. The liquid is first raised to the orifice of the spraying nozzle, and then carried along by the current of air in the state of infinitely small drops, a fact which has given these apparatus the name of "atomizing" carbureters.

The theory of this apparatus shows that a uniform mixture cannot be obtained with a single size of orifices for the flow of the liquid and air, or, in other words, with orifices that are invariable. It will always be possible with a given velocity of the motor to so manage that the elements of the mixture, liquid and air, shall be combined in the desired proportion to assure the best efficiency possible, that is to say, the completest and most instantaneous combustion possible. For this, it suffices to regulate one or both of the orifices at once. But such regulation will not prove satisfactory if the velocity of the motor increases or diminishes. The carburetion will become bad and the power of the piston-stroke will diminish until misfirings, and then a stoppage of the motor will occur.

In order that the carburetion shall remain constant, that is to say, that the ratio of the weights of the air and fuel shall be always constant, the relative size of the air and liquid orifices must change with the vacuum created in the apparatus by the suction of the motor. Such vacuum manifestly varies, and that, too, within very wide limits, with the velocity and charge of the motor.

Omitting details, it need merely be said that when the suction increases the section of the air-intake must be increased (that of the liquid remaining unchanged) in a proportion which is not fixed, but which is greater at the begin-

ning of the increase than afterward. This principle forms the basis of all automatically regulated or "automatic carbureters."

In such apparatus the orifice for the flow of liquid is fixed, as is also an air-orifice, which is opened only at the lowest speed of the motor, and consequently at the least suction. When the latter increases an extra air-inlet automatically opens to the necessary degree.

Figure 4 shows the arrangement of

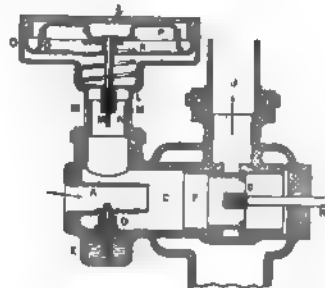


Fig. 4.

the automatic extra air-inlet in the Krebs carburetor. The gasoline passes through a strainer into the float-chamber (not shown in the figure), whence it enters the spray-tube, D. When the suction of the motor occurs (the throttle, G, being in the position indicated in the figure), it draws a volume of air through the invariable inlet, A, and, from the jet, a quantity of gasoline corresponding to the aspiration produced by a speed of about 200 r. p. m.. The mixture thus formed passes through J to the motor. The spraying tube enters the pipe, A, which is perforated to permit of its passage, and serves as a conduit for the mixture formed therein.

The extra air necessary at speeds greater than 200 r. p. m. enters by the orifices M, and mixes with the gas formed, Fig. 5. It has been said that

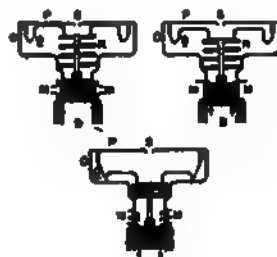


Fig. 5.

the suction alone controls the opening of these additional orifices. Now, the slide-valve, G, which is denticulated on one of its edges so that it may progressively open or close at the end of its travel, is controlled by the governor and moved by an antagonistic spring oper-

ated by the driver, and serves to increase or diminish the speed of the motor by its action on the weight of the mixture admitted. It is therefore a cock, which must not be confused with the valve K, which alone yields to the suction. It will be understood, moreover, that the movements of the valve correspond, as a general thing, to that of the cock, since it is the latter which, giving more or less gas to the motor, regulates its velocity, and consequently determines the aspiration in the carburetter. The lower face of the piston, Q, is submitted to the vacuum which prevails in the apparatus, and its upper face to the atmospheric pressure through an aperture, S, sufficiently small to allow the air to enter, with relative slowness, the chamber O (the capacity of which increases very quickly), when the disk, Q, is submitted to the suction of the motor, and, conversely, to allow the air to escape therefrom slowly when, the effort of suction ceasing, the spring, R, draws the disk, P, back into contact with the cover.

Carburetter, Alcohol, Longuemare.—Alcohol carburetters do not differ much from gasoline ones, although their structural details are not the same. The Longuemare establishment has devised an excellent type of alcohol carburetter, which may be described as follows:

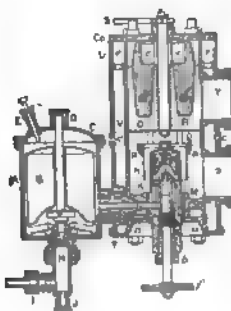


Fig. 6.

The suction of the motor takes place at Y (Fig. 6). The air enters at X, traverses the chamber P and O which, owing to the heat that it receives from the jacket V, through which passes a tube from the exhaust, is at a good temperature, and flows to the motor through Y. The alcohol is discharged through concentric slits at the bottom of the plug Z. The discharge is facilitated by the jacket, P N, which surrounds the spraying tube and increases the effect of the vacuum. On manipulating the disk O, through S, the driver permits the motor to aspire a greater or less quantity of gas.

Carburetter, Alcohol and Acetylene.—For some time past, experiments have been making with the simultaneous use of alcohol and acetylene as a fuel for internal combustion motors and the results obtained have been very encouraging. The experimental apparatus, devised by Messrs. Barker and White of New York,

consists of an ordinary carburetter in which the alcohol is atomized and mixed with air. This mixture, before entering the cylinder, passes through a wire gauze supporting calcium carbide. Alcohol usually contains 10 per cent. of water,

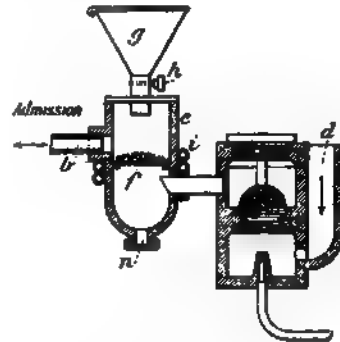


Fig. 7.

which is atomized with the mixture, acts upon the carbide, and forms acetylene gas. The result is that the calorific value of the mixture is considerably increased, and, moreover, the production of heat much greater. The apparatus employed is represented diagrammatically in Fig. 7. The alcohol enters through the pipe, c, and the air through d. A hopper, g, placed above the wire gauze, permits of the introduction of the carbide, the residuum of which makes its exit through the orifice n.

Carburetter, Kerosene.—In the carburation of air by means of kerosene, it is very necessary that particular attention be given to the vaporization process. The motor-cylinder either becomes coated with a hard carbon deposit due to the decomposition of the oil, or the cylinder becomes flooded with liquid oil which will not completely vaporize. If, however, the atomized mixture of carburetted air be drawn through a vaporizer at a nearly red heat, the carbon deposit will disappear; and when the carburetted air comes in contact with the main supply of air required for the combustion, and becomes thoroughly mixed there, the combustion appears to be practically complete without any deposit of carbon. Before the motor is started, the vaporization has to be effected by a separate heat source, or it may be started on a more volatile liquid, such as gasoline, for example, which may be changed for kerosene after the motor has become heated up. It is obvious, however, that where heat from the exhaust gases is used as a supply to meet the vaporizer, the regularity of its action must be affected by every condition that tends to vary the discharge of heat in the exhaust, so that every stroke without "explosion," every retardation with diminished fuel-

energy in the charge, etc., will interfere with its regularity.

One of the engineers who has worked most indefatigably over the difficult problem of creating a kerosene carburetter is M. Claudel. His device, which is illustrated in Fig. 8, comprises two

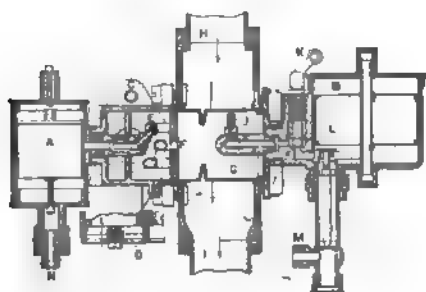


Fig. 8

spray-tubes, E, and J, each controlled by a different float. The first furnishes gasoline for the start, and the second kerosene. The suction takes place through the orifice E at the rear (at the center of the flange C). It will be seen that the spray-tube discharges against a tube, G (corrugated to prevent its expansion), which, being situated upon the passage H, of the motor-exhaust, thereby heats the kerosene.

Carburetters without Floats.—In the second class of carburetters, simplicity is attained by doing away with the float

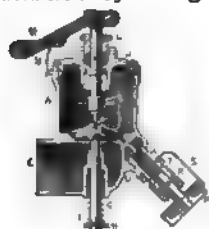


Fig. 9

This pipe opens into the space surrounding the needle-valve, O, which regulates the jet into A, the mixing-chamber. F is a mushroom-valve, kept on its seat by a spring. G, collar, I, and cotter. H. To C is connected the air-pipe.

In A there is a port B (shown by dotted lines) which opens into the pipe leading to the motor. This port is opened or closed by a gate fastened to D and actuated by a rod E. A lever, M, working over a notched quadrant, is fastened to E and serves to open or close the gate or "throttle." A spring, N, holds M in any required position. L is a stuffing-box. J the cover, K a hollow bolt to take up wear, S a spring retaining the milled head, P, of the valve, O, in any desired position, T a lock-nut holding S, U the threaded nut in which O works.

The throttle being opened, the suction-stroke of the motor draws a jet of fuel-vapor, at the same time raising the mushroom F, and drawing air through from C. Continuing, the mixture passes into the motor. When the inlet-valve (of the motor) closes, the parts resume their original positions. A serious fault with the ordinary mixing valve is found in the fact that, as the valve closes, the fuel remaining on the seat is projected backward by the angle of the seat, causing the valve to "spit" or "slobber" the fuel.

Carburettion.—The mixture of air with the vapor of a hydrocarbon which is effected in a carburetter.

The carburetion is said to be good or bad according as the mixture contains or does not contain the proper proportion of combustible air; and to "regulate the carburetion" means to regulate the proportions of the mixture. Such mixture varies with the liquid employed. For one part of liquid it requires fifteen parts of air to one of gasoline, nine with ethylic alcohol, and seven with methylic alcohol—by weight of course.

Carburize.—To mix with a hydrocarbon, as in a carburetter.

Carcel.—The light of a carcel lamp burning 42 grammes of colza-oil an hour, with a flame 40 mm high; a photometric standard equal to 9.2 candle.

Card-board, Asbestos.—See Asbestos.

Cardan Joint.—See Joint, Universal.

Cardan Shaft.—See Shaft, Cardan.

Card-wire.—A brush of fine steel wire, used for cleaning files.

Carello, F. e P. fratelli.—21 via Berthollet. Turin, Italy. Mfrs. acetylene and oil lamps.

Carey, Frank.—Pres. Sioux Falls Auto & Supply Co., 112-114 N. Main St., Sioux Falls, S. D.

Carey, Jas.—Head of automobile dept. Croftan Storage Battery Co., 423-425 W. Queen St., Toronto, Can.

Carey, J. J.—Pres., Gen. Supt. and Head of Foundry, Gerson-Carey Co., Kalamazoo St., and L. S. & M. S. R. R., Lansing, Mich.

Carey, John W.—Supt. David L. Parker & Co., 18 Market St., New Bedford, Mass.

Carey Mfg. Co.—Philip, Lockland, Ohio. Mfrs. asbestos.

Carleton Canoe Co.—Old Town, Me. Mfrs. motorboats.

Carlisle & Finch Co.—223 S. Clinton Ave., Cincinnati, O. Mfrs. lamps, magnets and ignition dynamos.

Carlisle Auto & Supply Co.—13 Main St., Carlisle, Pa. (Winton, Cadillac, Pope-Waverly.)

Carlisle Body & Gear Works.—Carlisle, Pa. Mfrs. wood and metallic bodies.

Carlisle, Charles Arthur.—Director Studebaker Bros. Mfg. Co., in charge of purchasing, advertising and traffic departments. B. Chillicothe, O., May 4, 1864; educated public schools of Chillicothe. Director Studebaker Bros. Mfg. Co., South Bend Malleable Iron Co.; Pres. American Trust Co. of South Bend. Member American Academy of Political and Social Science, Philadelphia, Pa.; American Institute of Civics, New York; Twentieth Century, Chicago, Ill.; Sphinx, New York; Columbia, Indianapolis, Ind.; Chicago Athletic Assn., Indiana, South Bend, Ind.; Northern Indiana Historical Society, South Bend, Ind.; Country, St. Joseph Valley, of which he was first president. Life member Scottish Patriotic Assn. of Glasgow, Scotland. Office and residence address, South Bend, Ind.

Carlisle, C. A.—Purch. Agt. Studebaker Auto Co., South Bend, Ind.

Carll Automobile Co.—Winchester, Mass. Garage.

Carlow Auto Co.—51-59 Weir St., Taunton, Mass. (Agt.; Winton, Buick.) Est. 1903. Cap. \$9,000. H. Carlow, Pres.; L. I. Baker, Treas.; E. A. Anthony, Sec. Garage, 70 cars. Repairing.

Carlow, H.—Pres. Carlow Auto Co., 51-59 Weir St., Taunton, Mass.

Carlson Auto Garage.—1060 Bedford Ave., Brooklyn, N. Y. (Winton.)

Carlson, Chas. A.—1016 Bedford Ave., Brooklyn, N. Y. Mfrs. gasoline marine motors.

Carlton Garage & Repair Co.—St. Marks & Vanderbilt Ave., Brooklyn, N. Y. (Deert.)

Carlton, Guy.—528 N. Main St., Bloomington, Ill. Garage.

Carlyle-Johnson Machine Co., The.—356 Asylum St., Hartford, Conn. Mfrs. friction clutches, cut-off friction clutches, marine reverse gears. Member M. & A. M. Cap. \$100,000. Est. December, 1903. John Stambaugh, Pres., Youngstown, Ohio; R. C. Steese, Sec., Youngstown, Ohio; S. H. Simon, Treas. & Gen. Mgr., Hartford, Conn. Head office, Youngstown, Ohio. Factory at above address.

Carman, J. R.—1546 E. Broad St., New Castle, Ind. Repairing.

Carmichael-Bray Co., Inc.—370 Golden Gate Ave., San Francisco, Cal. (Agt.; Elmore.) Est. 1907. Cap. \$25,000. Directors; F. E. Carmichael, E. A. Carmichael, and J. G. Carmichael, F. E. Carmichael, Pres. and Sales Mgr.; E. A. Carmichael, Sec. Treas. and Garage Mgr. Garage, 40 to 50 cars. Repairing.

Carmichael, E. A.—Mgr. Garage, Sec., Treas. and Director Carmichael-Bray Co., 370 Golden Gate Ave., San Francisco, Cal.

Carmichael, F. E.—Pres., Director

and Sales Mgr. Carmichael-Bray Co., 370 Golden Gate Ave., San Francisco, Cal.

Carmichael, J. G.—Director Carmichael Bray Co., 370 Golden Gate Ave., San Francisco, Cal.

Carnahan, A. G.—Monroe and Madison, St., Bloomington, Ill. Garage.

Carnegie Steel Co.—203 Ellicott Sq., Buffalo, N. Y. Mfrs. steel.

Carnegie Steel Co.—Pittsburg, Pa. Mfrs. angle, channel and tee iron and steel, iron and steel bar.

Carolina Garage Co.—1216 Plain St., Columbia, S. C. (Rambler, Northern.)

Carolina Locust Pine & Mica Co.—Franklin, N. C. Mfrs. mica.

Carpenter, Albert.—723 S. Liberty St., Muncie, Ind. (Pope-Waverly.)

Carpenter, Chas.—Vice-Pres. Pierce Engine Co., 2200 Clark St., Racine, Wis.

Carpenter, D. A.—First Vice-Pres. Humphreys Mfg. Co., 201 E. 5th St., Mansfield, O.

Carpenter, G. N.—Head of Accounting Dept. The Fisk Rubber Co., Oak St., Chicopee Falls, Mass.

Carpenter & Volkhardt.—2559 Indiana Ave., Chicago, Ill. Garage.

Carpenter, J. C.—Chester, S. C. Garage.

Carpenter, John M.—Sec. and Treas. Excelsior Carriage Co., Main St., White River Junction, Vt.

Carpenter, Reid.—Sec. and Treas. Humphreys Mfg. Co.—201 E. 5th St., Mansfield, O.

Carpenter Steel Co.—Reading, Pa. Mfrs. crank shafts, drop forgings, chrome-nickel steel, steel.

Carpentier, J.—20 rue Delambre, Paris, France. Mfrs. coils, gauges.

Carr, F. S.—74 Pearl St., Boston, Mass. Mfrs. curtain fasteners, leather, artificial leathers, rubber cloth, cloth and carpet trimmings.

Carr, Prescott & Co.—Amesbury, Mass. Mfrs. wood wheels.

Carr, R. H.—Sec. Auto Supply and Storage Co., 1416 Madison Ave., Baltimore, Md.

Carriage Dealers' Journal.—Pub. at Troy, N. Y.

Carriage Monthly.—1006 Arch St., Philadelphia, Pa. Pub. by Ware Bros.; monthly.

Carriage Woodstock Co.—Owensboro, Ky. Mfrs. wood and metallic bodies.

Carrington Auto Co.—Carrington, N. D. (Dragon.)

Carroll, J. B.—Treas., Sec. and Gen. Mgr. Fiss, Doerr & Carroll Co., 153 E. 24th St., New York City.

Carroll, J. B.—90-92 Illinois St., Chicago, Ill. Mfrs. gas lamp burners.

Carroll, Wm.—Purch. Agt. Simplex Automobile Co., 83d St., and East River, New York City.

Carrosserie Rhéda.—97 rue Nationale, Ivry-Port, Seine, France. Mfrs. bodies.

Carrozzeria Ciocca Francesco.—26 via della Zecca, Turin, Italy. Mfrs. bodies.

Carrozzeria Italiana e Cesare Sala.—45 corso Sempione, Milan, Italy. Mfrs. bodies.

Carson, Frank C.—Iowa City, Ia. (Knox.)

Carson & Co., H. E.—Holyoke, Mass. (Knox.)

Cartercar Auto Co.—San Francisco, Cal. (Cartercar.)

Cartercar Co.—1519 Belmont Ave., Philadelphia, Pa. (Cartercar.)

Cartercar Co.—249 3d Ave., Minneapolis, Minn. (Cartercar.)

Cartercar Co.—7 W. 60th St., New York City. (Cartercar.) Est. July, 1906. C. H. Galt, Agt. and Mgr., Fred. P. Harvey, Salesman.

Carter, A. Gary.—Pres. Carter Motor Car Corp., 409-10 Munsey Bldg., Washington, D. C.

Carter, C. C.—Santa Monica, Cal. Garage.

Carter, C. C.—5th St., Redlands, Cal. (Cadillac.)

Carter, Foster.—620 Spring St., Shreveport, La. (Maxwell.)

Carter, Frank L.—Treas., Gen. Mgr. Carter Motor Car Corp., 409-410 Munsey Bldg., Washington, D. C.

Carter Motor Car Corporation.—Detroit, Mich. Executive offices, 409-410 Munsey Bldg., Washington, D. C. Makers of the Carter two-engine car. First marketed 1907. Cap., \$2,000,000. A. Gary Carter, Pres.; W. D. Arrison, Vice-Pres.; W. E. Berry, 2d Vice-Pres.; Major George E. Pickett, 3d Vice-Pres.; Frank L. Carter, Treas. and Gen. Mgr.; W. Shirley Carter, Sec. and Asst. Treas.; J. E. Welsh, Asst. Sec.

Carter, W. Shirley.—Sec., Asst. Treas. Carter Motor Car Corp., 409-10 Munsey Bldg., Washington, D. C.

Carthage Auto Garage.—Carthage, Mo. (Maxwell.) Est. 1896. Garage, 15 cars. Repairing.

Carter, Chapman & Co.—Ludington, Mich. Mfrs. glass wind shields.

Cartwright, C. C.—Vice-Pres. Haynes Automobile Co., Main St., Kokomo, Ind.

Cary, Edward M.—Gen. Mgr. Cary Spring Works, 240-242 W. 29th St., New York City.

Cary Spring Works.—240-242 W. 29th St., New York City. Mfrs. steel wire and springs. Est. 1857. Edward M. Cary, Mgr.

Casasco, Alessandro.—19 via San Secondo, Turin, Italy. Mfrs. fur hats and caps, coats, pneumatic tires.

Cascade Foundry Co.—19th and Plum Sts., Erie, Pa. Mfrs. gray iron castings.

Casco Automobile Co.—Portland, Me. (Cadillac, Buick, Elmore, Packard, Peerless, Winton.)

Case.—Every metallic box in a motor-vehicle is called a "case" when employed as a receptacle for working parts, such as the crank-shaft, sliding-gear, etc. The case is almost always of aluminum, although sometimes of bronze, and more rarely of cast steel. The motor-case is usually divided into two parts, which are very accurately adjusted to each other, and the joints of which must be perfectly tight, since the case always contains oil which is violently splashed in all directions by the rotation of the fly-wheel or crank-shaft. Externally, the sides of the motor-case are provided with arms which permit of attaching it to the frame.

Case Auto Co.—Aberdeen, S. D. Garage.

Case Co., Geo. W.—54 Front St., Port Jervis, N. Y. (Rambler, Ford.) Est. 1879 in bicycle business, 1901 in automobile, Cap. \$5,000. Geo. W. Case, Pres. and Mgr. Garage, 40 cars. Repairing.

Case-hardening.—See **Hardening**, Case.

Case, Harry.—Logansport, Ind. (Haynes.)

Case-Long Machine Co.—Rushville, Ind. (Cadillac, Waltham.)

Casey, Edward.—387 Central Ave., Far Rockaway, N. Y. Garage.

Casey, Fred A.—Vice-Pres. Ashton Valve Co., 271 Franklin St., Boston, Mass.

Casey, Michael.—Pres., Director Pittsfield Spark Coil Co., Dalton, Mass.

Casing, Outer.—The external part, or "shoe" of a double-tube pneumatic tire.

Cassady-Fairbank Mfg. Co.—6106-6130 La Salle St., Chicago, Ill. Mfrs. gears, cones, cups. Hardening, stamping, plating and contract work. H. J. Cassady, Pres.; Dexter Fairbank, Sec. and Treas.; W. K. Thomas, Sales and Advt. Mgr.; Perry Shepard, Purch. Agt.

Cassady, H. J.—Pres. Cassady-Fairbank Mfg. Co.—6106-6130 La Salle St., Chicago, Ill.

Cass County Automobile Club of Logansport.—Fred M. Taft, Sec., Logansport, Ind.

Cassell Bros.—Jacksonville, Ill. (Pope Toledo.)

Cassier's Magazine.—3 W. 29th St., New York City. Pub. monthly by the Cassier Magazine Co.

Castellated Nut.—See **Nut**, Castellated.

Caster Action.—A term applied to the action of steering wheels, which are so mounted as to trail behind their supporting point after the manner of a caster.

Castillon de Saint-Victor, Count Georges de.—74 Avenue Marceaux, Paris. France. Born at Chateau de la Grève in 1870. A celebrated aeronaut whose first ascent was made in 1870. This same year he made the splendid Paris-Vesterwick (Sweden) trip of 812 miles, in a straight line (record of the world at that time). He, Oct. 10, 1899,



established with Count de La Vaulx the world's record (Paris-Korostychew); and in October, 1903, the Paris-Silesia trip (671 miles in 19 hours) etc. He organized at Tunis the preliminary experiments for the aerial crossing of the Sahara. He is

treasurer of the Aero Club of France, of which he is one of the most respected directors and best champions.

Casting.—An object of metal formed by pouring molten metal into a mould of requisite shape. Cast metal is generally more brittle than wrought, that is to say, hammered or rolled metal. A casting shrinks considerably in cooling and allowance has to be made for this by giving the mould larger dimensions than the finished article is to have. (2) The process of producing objects from molten metal

Casting, Chilled.—Metal cast in iron moulds instead of sand.

Castings.—Cleveland, O. Pub. monthly by the Gardner Printing Co.

Cast Iron.—See Iron, Cast.

Cast Iron Brazing & Mfg. Co.—Manchester, N. H., Mfrs. braziers, brazing compound.

Castle, Fred'k. E.—B. Oct. 9, 1863, at Newburgh, N. Y. Educated at public schools. Occupation, Sales Mgr. Gray

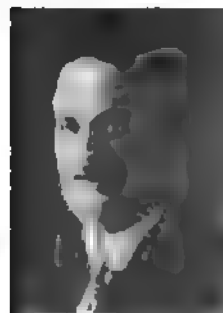


Photo by Spencer & Wells

& Davis Member Cleveland, Buffalo, Detroit Automobile Clubs, A. A. A. New York Motor Club. Residence, The Charlevoix, Detroit, Mich. Office, 214 Jefferson Ave., Detroit, Mich. Connected with automobile trade since 1901. Owned first Cadillac car in 1901

Castle, H. C. & C. D.—893 Boylston St., Boston, Mass.; 19 Lyman St., Springfield, Mass. (Lozier.)

Castor Oil.—See Oil, Castor.

Cast Steel.—See Steel, Cast.

Caswell Auto Co.—Lowell, Mass. (Maxwell.)

Catalysis.—A phenomenon through which one or more substances separate or combine under the somewhat mysterious influence of another body, which is itself in nowise influenced by the reaction that it produces. Thus, silver powder decomposes oxygenated water, without itself undergoing any chemical modification. In like manner, spongy platinum, charcoal, etc., without any change in chemical composition or physical appearance, bring about the combination of hydrogen and oxygen to form water.

Catalytic Ignition.—See Ignition.

Catch.—A term in mechanics for numerous devices which engage with and hold or fasten some object.

Catelein, Andre G.—1446 Indiana Ave., Chicago, Ill. Garage.

Cateract Machine & Automobile Co.—1-3 W. Niagara St., Niagara Falls, N. Y. Garage.

Caters, Baron Pierre de.—Berchem-des-Anvers, Belgium. Born at Antwerp. Dec. 25, 1875. Baron de Caters is one of the best known sportsmen of the automobile world.

He made his debut as a chauffeur in the Paris-Bordeaux race in 1901 upon a Mors car; then, in 1902, he ran the Paris-Vienna and the Circuit of Ardennes races. In 1903 he disputed the Turbia, in which he came in second, and the Nice-Salon-Arles race, in which he won the second place, and then the Bennett cup in Auvergne, and, finally, the Circuit of Ardennes, and the Saillon races, which he won. Baron de Caters ran, in addition, the majority of the speed tests at Ostende, Nice and Spa. For several months he held the kilometre record of the world. He is the creator of the Cater's cup, which he founded in 1902, and of another Cater's cup, reserved for the automobile clubs of the North

Cathay Hardware & Improvement Co.—Cathay, N. D. (Waltham.)

Cathcart, C. W.—Vice-Pres. Hess-Pontiac Spring & Axle Co., Pontiac, Mich.

Cathode.—The conductor or electrode by which an electric current leaves a conducting system, for example, a liquid or gas.

Cation.—In electrolysis, the "ion" (q. v) in a solution which travels toward the cathode, q. v.

Catlin, F. B.—Winsted, Conn. (Cadillac.) 2nd hand cars. Supplies.

Cattaraugus County Automobile Club.—George Forbes, Sec., Olean, N. Y.

Caulkins & Co., F. L.—405-415 Main St., Middletown, Conn. (Cadillac.)

Knox, Winton, Pope-Hartford.) Supplies, garage, repairing.

Caux et Périer.—29 ave Parmentier, Paris, France. Mrs. tire pumps.

Cave Rims, Ltd.—80 Ossory Rd., Old Kent Road, London, S. E., England. Mrs. detachable rims.

Cavin, J. H.—McComb, O. (Jewel.)

Cavitation.—A phenomenon, called also "stern suction," which occurs when the propeller of a motor-boat is driven at too high a speed. Under such circumstances a cavity is formed astern, due to the reduction of the pressure being so great as to form a vacuum. When this phenomenon occurs, there is a great loss of efficiency in the propeller.

Cedarhurst Auto Co.—Lawrence, N. Y. Garage.

Cedar Rapids Automobile Club.—George Henderson, Sec. Cedar Rapids, Ia.

Cedar Rapids Auto & Supply Co.—307 3d Ave., Cedar Rapids, Ia. (Ford, Maxwell, Jackson, White.)

Cedrine, Emanuel.—A well-known driver of racing cars on both road and track. He competed in the second Vanderbilt race, driving a Fiat car in that event. On the track he has driven in the chief events, meeting with a fair amount of success. For several years he has been connected with the Hol-Tan Company in various capacities.



Cell, Primary.—A means of obtaining electrical energy by the actual consumption of some metallic element, usually zinc, which is converted into its sulphate or some other salt. The cell cannot thereafter be again employed without the introduction of entirely fresh material, and, in this, differs from the "secondary cell" or "accumulator." The principal forms of primary cells in common use are the "Bichromate," "Grove's," "Bunsen's," "Daniell's," "Lalande's" and "Leclanché." In the latter the negative plate is zinc acted upon by a solution of ammonium chloride (sal ammoniac), while the positive is a rod of carbon packed in a mass of manganese dioxide, which furnishes a supply of oxygen, and therefore acts as a depolarizer. After this cell has been in operation for a very short time, it becomes polarized, and it is some time before the manganese dioxide can destroy the polarization. If, however, a comparatively long rest be given the cells between short intervals

of use, it easily recovers and will last a very long time without any further attention than the addition of a little water. It is chiefly used for intermittent work, such as operating electric bells and telephones.

Two or more primary cells joined together to form a "battery" are used for supplying an electric current to operate ignition apparatus. Of these there are two types, "wet" and "dry." The "dry" battery, which usually consists of some form of Leclanché cells, in which the exciting fluid is mixed with a material to make it a kind of damp paste, is the one most commonly used on motor-cars, because of the small space it occupies and its cleanliness. This battery, which is sealed, usually consists of from four to six dry cells "in series." It is called an "open circuit" battery, because it is intended to be used where the circuit is open most of the time. Two such batteries are generally included in a car's outfit, either of them being switched into circuit as required, or both being connected "in multiple" to give a greater current at the same voltage. In many cases, the chemical battery is used only for sparking at the start of the motor, and until the magneto or dynamo has attained sufficient speed for continuous effect, and then being automatically switched out of circuit. "Wet" batteries, which also are of the open type, are employed only on motor-boats or for stationary gasoline engines where the saving of space is no object.

Cell, Storage.—A storage-cell, called also an "accumulator" or "secondary cell," is one so constructed that there can be imparted to it a charge of electricity which it will afterward give out as required.

Storage-cells are of two types, the first of which, the Planté, consists of an uneven number of lead plates placed face to face in a box, in which they are prevented from coming into contact by separators of celluloid or ebonite, etc. The alternate plates are connected and brought out to two terminals.

When such plates are connected to a primary source of electricity, and placed in a mixture of sulphuric acid and water ("electrolyte," as it is called), bubbles are given off from both surfaces of the plates, and, after a time, one will have been per-oxidized and become of a brown color, while the other, having been converted into spongy lead, will remain of a lead-gray color. The brown plate is the positive and the lead-gray one the negative. The amount of peroxide and spongy lead "formed" on the lead depends upon the length of time the plates are submitted to the action of the current. On disconnecting the wires of

the charging battery, the cell will retain its energy for a considerable time; and on being connected to any electric apparatus, will furnish a current until it is exhausted. The cell can then be recharged and the operation be repeated a great number of times. The "capacity" of cells made in this way and termed "formed" cells, may be regarded as being from 6 to 9 ampere-hours per pound of metal. The great objection to such cells is their weight, but, as an offset to this, they are long-lived, and, for their maintenance, cost relatively little.

The second, and most usual type of accumulator employed in motor-car work was introduced by Faure in 1881, and contains what are styled "pasted" plates. In this, the "active material," consists of a paste of red lead and litharge supported in gratings or "grids" of lead. Such paste forms a hard cement, and, when the plates are immersed in the electrolyte, and are connected with a source of electricity, the red lead is changed into brown peroxide of lead on the positive plates and gray, spongy lead on the negative ones. It may be readily seen that this plan not only permits of obtaining a wide surface in a small cell, but also of effecting a saving in the time that it takes to "form" plates.

A box containing one set of positive and one set of negative plates is termed a "cell," and the box divided into two or more divisions, each with its set of plates, is termed a "battery."

Charging.—A storage-battery may be charged by a 110-volt lighting circuit by connecting incandescent lamps into the circuit in multiple in such a way that the only current that can reach the battery must pass through the lamps. But the best current for charging is furnished by a direct current dynamo of which the voltage can be regulated to the amount required for the battery. The charging rate of a new battery at the initial charge should be not more than a 2-ampere rate. A battery should be charged whether used or not, and should be discharged to 1 7-10 volt and immediately recharged every two months in order to displace and replace all of the active material. This will preserve the maximum output. The normal output of a battery is the ampere-hour capacity divided by 8. This means that $\frac{1}{8}$ of the capacity can be drawn out steadily for eight hours. The ampere-hour capacity is the amount that can be drawn out in eight hours flowing at a steady rate.

Efficiency.—By efficiency of a storage battery is meant the ratio of energy which the battery gives out during discharge to that which it absorbs during the charge. The energy stored up in an

accumulator is measured by the potential at the terminals during the charging, multiplied by the strength of the current and by the time. The product gives the energy in volt-ampere-seconds or "joules." In like manner, the energy given out in the discharge is the potential into the current-strength into the time of discharge.

Cellular Radiator.—See Radiator, Cellular.

Cellular Tire.—See Tire, Cellular.

Celluloid.—A mixture of nitrated cellulose and natural or artificial camphor, which, after being saturated with alcohol, is submitted to very strong pressure in a hydraulic press. Celluloid is a hard, yellow, transparent substance with the odor of camphor and aspect of horn, and utilizable as a substitute for ivory, horn, bone, etc. It softens at about 176° F. (80° C.), is highly inflammable, and burns with a smoky flame. It is often colored by the addition of other substances and then loses its transparency. It is soluble in acetone and especially acetate of amyl. Such a solution, which is more or less sirupy, serves for cementing celluloid objects, such as accumulator boxes, etc.

Cement.—In metallurgy, a mixture of one part hard charcoal, one-tenth part of wood ashes, and one-twentieth part of common salt ground into a coarse powder and employed for the cementation of steel. See Cementation.

Cementation.—The older process for the manufacture of steel, which is now largely superseded by the "Bessemer Process," q. v. Bars of wrought iron are packed in fire-brick boxes or troughs, termed "converting pots," imbedded in "cement" and heated in a furnace for a few days. A part of the carbon is gradually absorbed by the iron, which is thus converted into steel.

Cementite.—The carbide of iron, FeO, which is present in high carbon steel.

Centaur Motor Co.—53-61 Franklin St., Buffalo, N. Y. Est. 1902. Cap. \$100,000. Agts.; Peerless, Pope-Toledo, Winton, Autocar, Oldsmobile, Cadillac, Darracq. Mfrs. steering gears, steering wheels, hoods, dashes, radiators, metal tool boxes, automobile sundries. J. B. Eccleston, Pres. and Treas.; U. S. Thomas, Sec.; A. J. Sanderson, Head Sales Dept.; E. A. Burkhardt, Repair Dept.; C. E. Hoffman, Sundry Dept.; H. H. Holton, Steering Wheel Dept.; O. L. Gooden, Garage Dept. Garage, 200 cars; repairing.

Centi.—A prefix which sometimes signifies a hundred (as in "centigrade"), but which has always the sense of "hundredth" part when it precedes the names of measures adopted in the metric system (as "centimetre," "centilitre").

Centigrade Scale.—A temperature scale called also "Celsius scale," universally used in science. See Thermometer.

Centimetre.—The centimetre is the unit of length of the C. G. S. system. It is the hundredth part of the length at 0°C. of a certain bar of platinum named the "International Metre."

Central Auto Co.—Alliance, O. Garage.

Central Auto Co.—18th St. and Grand Ave., Kansas City, Mo. Garage.

Central Auto Co.—Franklin St. and Jackson Blvd., Chicago, Ill. Dealers in 2nd hand cars. Garage, 150 cars. Repairing. Rental service. Est. 1902. Cap. \$5,000. F. D. Abbott, Pres. and Sec.; E. L. Abbott, Treas. and Gen. Mgr.

Central Auto Co.—Lancaster, Pa. (Franklin.)

Central Auto Exchange.—14 Alexandrine Ave., Detroit, Mich. Garage.

Central Auto Exchange.—71 Fountain St., Providence, R. I. (Monarch, National, Wayne.)

Central Auto Exchange.—14 Alexandrine Ave., W., Detroit, Mich. Garage.

Central Automobile Co.—170 Central Ave., Albany, N. Y. (Ford, Maxwell.)

Central Automobile Co.—5989 Center Ave., Pittsburg, Pa. (Reo.)

Central Auto Co.—839 Chapel St., New Haven, Conn. (Maxwell.)

Central Automobile Co.—11 Crown St., New Haven, Conn. (Aerocar, Stoddard- Dayton, Maxwell.)

Central Automobile Co.—2169 9th St., Cleveland, O. (Matheson, Studebaker.)

Central Auto School.—238-40 W. 50th St., New York City. Automobile instruction.

Central Auto Station.—236 Main St., New Britain, Conn. (Stevens-Duryea.) Est. 1905. W. L. Hatch, Mgr. Garage, 20 cars; repairing.

Central Auto Station.—238 W. 50th St., New York City. Garage, repairing.

Central Automobile Shop.—19 N. May St., Manchester, N. H. Garage.

Central Automobile Station Co.—55 West St., Pittsfield, Mass. (Pierce-Arrow, Franklin, Pope-Hartford, Stevens-Duryea.) Supplies, garage, repairing.

Central Brass Works.—Cincinnati, Ohio. Mfrs. brass pipe fittings.

Central Carriage Co.—134 Ontario St., Toledo, O. (Queen, Auburn, Maxwell, Mitchell.)

Central Electric Mfg. Co.—1525 2d Ave., Rock Island, Ill. Mfrs. primary batteries.

Central Garage.—Fulton St., Hempstead, N. Y. (Jackson, Austin.)

Central Garage.—Durfee St., Opp. Armory, Fall River, Mass. Supplies, repairing, garage.

Central Garage.—314 S. Camac, Philadelphia, Pa. Garage.

Central Garage.—12th and Madison Sts., Oakland, Cal. (Cadillac.)

Central Garage Co.—Rockford, Ill. Garage.

Central Garage Co.—1310 New York Ave., Washington, D. C. Garage.

Central Leather and Rubber Tire Works.—238-240 W. 50th St., New York City. Mfrs. leather tires.

Central Maine Automobile Garage.—8 Charles St., Waterville, Me. Garage.

Central Mfg. Co.—Connersville, Ind. Mfrs. bodies. Cap. \$100,000. Est. 1898. W. B. Ansted, Pres.; A. Deaton, Mgr.

Central Motor Car Co.—150 S. Howard St., Akron, O. (Pope line.) Est. 1904. J. W. Hassenflue, Prop.

Central Motor Car Co.—Washington and Fairfield Sts., Bloomfield, N. J. Agts.; Mitchell, Jackson. Cap. \$25,000. Chas. R. Underwood, Pres.; Chas. W. Smith, Vice-Pres. and Sec.; Ernest H. Cadmus, Treas. Garage, 30 cars; repairing; supplies.

Central Park Auto Garage.—1185 Market St., San Francisco, Cal. Garage.

Central Penn Auto Co.—111 Market St., Harrisburg, Pa. (Buick, Cadillac, Pope-Toledo, Pope-Waverly, Winton, Franklin, White, Pope-Hartford.)

Central Tire Co.—Central Ave. & Halsey St., Newark, N. J. Vulcanizing.

Centre, Dead.—The position called also "deadpoint," of a crank when it cannot be turned by the motion of the piston-rod, that is to say, when the crank and piston lie in the same straight line.

Centre of Gravity.—See Gravity.

Centre-punch.—See Punch. Centre.

Centrifugal Blower.—See Blower.

Centrifugal Force.—See Force, Centrifugal.

Centrifugal Pump.—See Pump, Centrifugal.

Century Automobile Co.—450 Golden Gate Ave., San Francisco, Cal. (Kissel Kar.)

Century Mfg. Co.—272 W. Genesee St., Buffalo, N. Y. Mfrs. paints, varnishes.

Century Specialty Co.—401 Deshler Ave., Columbus, O. Mfrs. gasoline strainers.

Ceresine.—A substance called also "fossil wax" and "ozokerite" found in Moldavia in a layer of bituminous shale. It is an excellent insulator, and is employed as such.

Centripetal Force.—See Force, Centripetal.

Ceulemans, J.—8 rue d'Espange, St. Gilles, Brussels, Belgium. Mfrs. wood wheels.

C. G. V. Import Co.—1849 Broadway, New York City. Importers C. G. V. cars. Est. Oct., 1906. Cap. \$120,000.

Emile Voigt, Pres.; Albert Lasserre, Vice-Pres. Repair shop at 549 W. 59th St.

Chaboche, E.—33 rue Rodier, Paris, France. Mfrs. automobiles, comm., gas. (Chaboche trucks.) Automobiles, steam. (Chaboche cars.)

Chabot, C. J.—337 Commerce St., Dallas, Tex. (Elmore.) Est. 1904.

Chadwick & Co., G. B.—11 Post St., Portsmouth, N. H. (Lambert.)

Chadwick Engineering Works.—3207 Spring Garden St., Philadelphia, Pa., and Pottstown, Pa. Makers of the Chadwick car. First marketed 1904. Six different models made since. Cap. \$350,000. L. S. Chadwick, Vice-Pres., Gen. Mgr. and Supt.; E. S. Fretz, Treas.; H. L. Potts, Sec.; Frank Bement, E. H. Buckman, Herbert Bell, Directors; J. T. Nicholas, Purch. Agt.; Director and Designer; H. B. Larzelere, Sales and Advt. Mgr. Agents and dealers: Atlas Automobile Co., Pittsburg, Pa.; Curtis-Hawkins Co., Motor Mart, Boston, Mass.; Fishbeck, Fred, Tonopah, Nev.; Hamilton Automobile Co., 1218-1220 Michigan Ave., Chicago, Ill.; Rutledge Bray, Oakland, Cal.; Troy Carriage Works, Albany and Troy, N. Y.

Chadwick, J. W.—Mgr. Lawrence Motor Car Co., 13-17 W. Warren St., Lawrence, Kan.

Chadwick, L. S.—Vice-Pres., Gen Mgr. and Supt. Chadwick Engineering Works. 3207 Spring Garden St., Philadelphia, Pa.

Chain.—A number of metal links flexibly connected at their extremities and employed for communicating motion from one sprocket-wheel to another in chain-driven motor vehicles. There are two chief types: (1) "Block chains" and (2) "roller chains," in which the screwed pin on which the links hinge runs through a tubular roller, which can revolve as it passes over the teeth of the sprocket, thereby diminishing the friction.

In operation, the first of these, the block chain, when it is somewhat slack, is apt to meet the sprocket with a continual clapping, which, at a high speed, becomes a continual rattle. The roller chain, on the contrary, is, to a great extent, free from this defect, and, moreover, being easier to operate, economizes power. For these reasons, as well as the fact of its being superior in strength to



the block chain, the roller chain (see figure) is now found in almost universal use on chain-driven motor vehicles.

The adjustment of the chain requires

care. If too tight, there will be a loss of power through undue friction, and a breakage may result; and should the chain cause a knock at any time through the jumping of a tooth, it is a sure sign that it is dangerously loose. In this case the trouble may be remedied by tightening the chain adjustment-nuts, or, if necessary, by taking out a complete link. Care should be taken to see that the "master-link" (called also a "repair-link" and "connecting link") which fastens the ends of a chain is secure. If one link is wearing faster than the others, it should be replaced with a new one, and, for this purpose, at least one or two spare links and pivots should be carried so as to be always ready at hand in case of emergency. Care should be taken, too, as to chain adjustments, since breakages on a hill or elsewhere may render the brake inefficient and cause a serious accident.

Chains should be taken off periodically, the links and rivet-holes examined, and, if necessary, the chain be immersed in melted fat or tallow, or all the rubbing surfaces be lubricated with a paste of paraffine and graphite applied with a brush. With a chain that is inclosed, it will probably suffice to rub it well with a thin paste of graphite and alcohol.

Chain-case.—A case for enclosing the chain of chain-driven cars and protecting it from the action of sand, mud and rain.

Chain-drive.—The transmission of power by chains from the jack-shaft to the road-wheels, or from the engine direct to a live axle, as in steam-cars.

Chain, Driving.—A chain through which the driving of the wheels of a motor-vehicle is effected.

Chain, Leaf.—A chain with flat links, called also a "cable."

Chain-lubrication.—See Lubrication.

Chain-ring.—The toothed ring which is secured to the spoke of the hub of a rear wheel on cars with side-chain transmission.

Chain, Pitch.—A metal chain, such as that used on a bicycle, for transmitting motion from one sprocket-wheel to another.

Chain, Side.—A chain arranged to drive from the ends of the jack-shaft to driving-wheels revolving upon a dead rear axle.

Chain-sprocket.—The chain-wheel at the end of the differential or counter-shaft. See Sprocket.

Chair, Spring.—Same as spring-saddle. q. v.

Chalfant, Edward Painter.—Sales and Advt. Mgr. Waltham Mfg. Co., Waltham, Mass. B. near Towsen, Md. Ed. Sherwood Academy, Ashton, Md. Mem. Bay State Auto Ass'n., Ad. Men's Club, Boston. Woodland Golf Club, Auburndale, Mass. Res. Woodland Park Hotel, Au-

burndale, Mass. In trade since Jan. 1, 1905. Used first automobile April 1, 1905. Recreations: Automobiling, golfing.

Chalfant Motor Car Co.—Lenover, Pa. Mfrs. automobiles, gas.

Chalk, French.—A soft and unctuous silicate of magnesia, called also "soap-stone," "talc" and "steatite," and which, in the state of a fine powder, is employed for keeping the inner tubes of pneumatic tires from adhering to their casings.

Chalmers, Hugh.—Pres. E. R. Thomas Detroit Co. Co., 2704-18 Jefferson Ave., Detroit, Mich.

Chamber, Combustion.—See Combustion-chamber.

Chamber, Crank.—See Crank-chamber.

Chamber, Float.—The portion of a carburetter in which the float is located.

Chamberlain, C.—434 Front St., Ionia, Mich. (Maxwell, Ford.)

Chamberlin, C. C.—Mgr. Charter & Co., 303 Dearborn St., Chicago, Ill.

Chamberlin, George Finch.—Lawyer; b. April 15, 1861, Croton Falls, N. Y.; graduate Lafayette College, 1881, and Columbia Law School, 1883; admitted to N. Y. bar, 1884.



Mem. Lafayette College and Dwight Alumni Assns. Together with Whitney Lyon, issued a call for a public meeting of automobile owners at the Waldorf-Astoria, June 7, 1899, which resulted in the formation of the

Automobile Club of America, of which he was elected first acting president. Member and club historian of Automobile Club of America, member American Yacht, City and Apawamis Clubs. Residence, 67 W. 52d St. Address, 31 Nassau St., New York City.

Chamberlin, C. E.—Vice-Pres. and Supt. Jos. N. Smith & Co., 4th and Porter Sts., Detroit, Mich.

Chamberlin, R. R.—Leoti, Kan. (Waltham.)

Chamber, Mixing.—The space in a gasoline motor in which the gas is mixed with air.

Chambers & Ainslee.—2 Commercial St., Newark, N. J. Brass fittings, specialties and patented articles in brass or bronze.

Chambers & Son, J. B.—304 N. Vermillion Ave., Danville, Ill. (Pope-Toledo.)

Chambers Motors, Ltd.—Cuba St. Works, Belfast, Ireland. Mfrs. automobiles, gas. (Chambers cars.)

Chameroy, E. at A.—roue de Sartrouville, Vesinet, Seine-et-Oise, France. Mfrs. non-skid bands.

Chamber, Valve.—See Valve-chamber.

Chamois.—A soft pliable leather used on automobiles as a material for straining gasoline.

Champaign Automobile Co.—Champaign, Ill. (Reo, Premier.) Garage, repairing. Inc. \$25,000. Incorporators, Jack C. Richmond, Manford Savage.

Champ, Duvall Co.—Canton, Ill. (Buick, Rapid.)

Champion, Albert.—Pres., Mgr. and Designer, Albert Champion Co., 36 Whittier St., Boston, Mass.

Champion Co., The Albert.—36 Whittier St., Boston, Mass. Mfrs. Gianoli magnetos, spark plugs, coils. Cap. \$5,000. Est. March, 1905. Albert Champion, Pres., Mgr. and Designer; Frank D. Stranahan, Treas.; Spencer Stranahan, Sec.; F. E. Sanborn, Supt.; Robert Stranahan, Sales Agt.

Champion Mfg. Co.—9-15 Alling St., Newark, N. J. Mfrs. mufflers.

Champion Oil Co.—39th St. and Lowe Ave., Chicago, Ill. Mfrs. oils.

Champion Wagon Co.—Owego, N. Y. Mfrs. automobiles, elec., comm.

Chandler & Sons, W. C.—Plymouth, Mass. Garage.

Chandler Co., The.—31 Taylor St., Springfield, Mass. Mfrs. stampings in brass or steel, name plates, steel stamps, letters and figures for hub caps, radiators, etc. Member M. & A. M. Cap. \$5,000. Est. 1893. Inc. 1902. M. H. Chandler, Pres.; L. J. Chandler, Treas. and Mgr.; C. H. Drude, Vice-Pres., Head of Engraving Dept.; C. H. Osborn, Head of Machine Dept.

Chandler, A. N.—Marshfield, Mass. (Waltham.)

Chandler, H. W.—Pres. and Mgr. Cleaner Mfg. Co., 28-42-44 Olive St., St. Louis, Mo.

Chandler, L. J.—Treas. and Mgr. The Chandler Co., 31 Taylor St., Springfield, Mass.

Chandler, M. H.—Pres. The Chandler Co., 31 Taylor St., Springfield, Mass.

Chandler Oil Cloth & Buckram Co.—East Taunton, Mass. Mfrs. cloth and carpet trimmings.

Chandler, W. N.—Sec. and Treas. Cleaner Mfg. Co., 28-42-44 Olive St., St. Louis, Mo.

Change-speed Gear.—See Gear, Change-speed.

Change-speed Lever.—A lever, usually hand-operated, by which the different speeds of a motor vehicle are controlled.

Channel.—The groove in the periphery of a pulley or wheel in which engages a cord or belt that receives or transmits motion.

Channel Iron.—See Iron, Channel.

Channel Steel.—See Steel, Channel.

Channon & Co., H.—Market and Randolph Sts., Chicago, Ill. Mfrs. automobile covers, tire repair kits.

Chapin, A. A.—1st and M Sts., N. E., Washington, D. C. (Rapid.)

Chanslor & Lyon Motor Supply Co.—542-544 Golden Gate Ave., San Francisco, Cal. Supplies, vulcanizing.

Chantemède.—47 ave de la Republique, Paris, France. Mfrs. motorcycles. (C. D. M. motorcycles.)

Chapell, C. Will.—Oneida, N. Y. Pres National Casket Co.

Chapin, H. Winfield.—B. Dec. 30, 1867, at Oswego, N. Y. Educated at Syracuse public schools. Occupation, Mgr., Sec. and Treas. Brown Lipe Gear Co.; Sec. Syracuse Aluminum & Bronze Co. Member of Citizens Club, Old Heidelberg Club, Mystic Krewe of Kanoona. Connected with automobile trade since 1899, owned first car in 1902. Member of Syracuse Chamber of Commerce, Syracuse Metal Trade Association. Residence, 1012 W. Genesee St. Address 206 S. Geddes St., Syracuse, N. Y.

Chapin, Roy Dikeman.—B. Feb. 23, 1880. Graduate Lansing high school, University of Michigan. Occupation,

Treas. and Gen. Mgr. E. R. Thomas Detroit Co. Director E. R. Thomas Detroit Co. Mem. University, Detroit, Detroit Boat. Detroit Club Yachtsmen, A. C. of Detroit, Country Club. Connected with automobile trade since 1901. Residence 525 Jefferson Ave.,

Detroit, Mich. Office address, E. R. Thomas Detroit Co.

Chaplet.—A form of tire-bolt, the head of which fits inside of the shoe, to which the bolt, passing through the rim, is held by a wing-nut. The head is faced with rubber fabric to prevent rubbing the tire. (2) A metal support for a core in the mould

Chapman & Co., J. B.—51 Taylor St., Springfield, Mass. Mfrs. bronze metals.

Chapman-Ball-Bearing Co.—40 Bristol St., Boston, Mass. Mfrs. ball bearings.

Chapman, H. A.—Pres. S. L. Crosby & Co., 186 Exchange St., Bangor, Me.

Chapman, L. S.—Vice-Pres. Syracuse & Eldridge Glove Co., 924 S. Salina St., Syracuse, N. Y.

Chapman, Treat P.—Brookfield, Mo. (Waltham.)

Chapp, C. C.—Purch. Agt. Glidden

Varnish Co., Rockefeller Bldg., Cleveland, Ohio.

Charcoal Iron.—See Iron, Charcoal.

Charge.—The quantity of electricity which is present on the surface of a body or conductor. (2) The mixture of air and gas drawn into the cylinder of a gas-motor at one stroke of the piston.

Charge, Electric.—See Electric Charge.

Charging.—The operation of forcing a current of electricity through a storage-cell, in order to regenerate it for further period of use. See Cell, Storage.

Charleston Motor Co.—161 Meeting St., Charleston, S. C. Agts. Reo. Premier. Est. November, 1906. Cap. \$5,000. T. B. Jenkins, Pres. and Treas.; J. E. Richard, Sec. and Mgr. Garage, 30 cars; repairing.

Charles, Wm.—Foreman Bryant Garage, 50-56 W. 43rd St., New York City.

Charlesworth Bodies, Ltd.—Coventry, England. Mfrs. tops.

Charley, C. L.—A Parisian automobile

dealer, at one time an important figure in the European trade. For a number of years he controlled the sale of Mercedes cars in Paris and the United States. The success of the Mercedes in winning the 1903 Bennett race gave

that car great prestige, and Charley took advantage of this fact to largely extend their sale.

Charlonneau & Sons, E.—Ironwood, Wis. (Rambler.)

Charron, Fernand.—Villa Grétry, Avenue Grétry, Maisons-Lafitte (Seine-et-Oise), and 45 Avenue de la Grande-Armée, Paris France. Born at Angers in 1866. Co-proprietor of the General Automobile Agency.

and manager of the Société des Automobiles Charron, Ltd., at Puteaux (Seine). He is one of the most prominent persons of the automobile world. He was three times bicycle and tricycle champion of France for en-

durance and speed. In 1885, he was employed by Rudge, with Cirry as manager. In 1892 he was manager of the house of Clement, Rue du Quatre Sep-



tembre; and in 1893, manager of the Humber cycles. In 1897, foreseeing the future of the automobile, he founded the General Automobile Agency. In 1900 he won the Marseilles-Nice, Paris-Amsterdam, Paris-Bordeaux and the first Bennett cup races. In 1901 he founded the C. V. G. manufacturing house, the amount of whose business has risen from \$200,000 the first year to \$1,200,000 the fourth.

Charron, Ltd.—7 rue Ampere, Putaux, Seine, France. Mfrs. automobiles, gas. (C. G. V. cars.)

Charter & Co.—303 Dearborn St., Chicago, Ill. Est. 1905. Mfrs. and jobbers, spark plugs, storage batteries, mechanical oilers. C. C. Chamberlin, Mgr

Chase, A. C.—Vice-Pres. Chase Motor Truck Co., Syracuse, N. Y.

Chase, Mrs. A. F.—Vice-Pres. Chicago Women's Motor Club, Chicago, Ill.

Chase, A. M.—Pres., Gen. Mgr. and Designer, Chase Motor Truck Co., Syracuse, N. Y.

Chase & Co., A. F.—418 3rd Ave., S., Minneapolis, Minn. (Brush, Maxwell.)

Chase & Nicson—936 Jefferson Ave., Detroit, Mich. Garage.

Chase Auto Co.—201 Pitman St., Providence, R. I. Garage.

Chase, Charles S.—Portland Me. (Buick.)

Chase Co., L. C.—Boston, Mass. Mfrs. rubber and leather goods.

Chase, H. M.—Sales and Advt. Mgr. Chase Motor Truck Co., Syracuse, N. Y.

Chase, J. M.—Enfield, N. H. (Jackson)

Chase, L. O.—193 Main St., Oshkosh, Wis. (Thomas.) Est. 1892. Repairing.

Chase Motor Co.—201 Pitman St., Providence, R. I. Mfrs. gasoline marine motors.

Chase Motor Truck Co.—232 E. Water St., Syracuse, N. Y. Makers of the Chase truck. Cap. \$40,000. A. M. Chase, Pres., Gen. Mgr., Designer; A. C. Chase, Vice-Pres.; H. P. Bellinger, Sec. and Treas.; Walter Killum, Supt.; F. F. Brewer, Purch. Agt.; H. M. Chase, Sales and Advt. Mgr. (Atlas, Stoddard-Dayton.)

Chase Motors.—Station Rd., Adderley, London, S. E., England. Mfrs. automobile motors.

Chase, Roberts & Co.—West Ave. and 5th St., Long Island City, N. Y. Mfrs. varnishes, wood fillers. Japans. Cap. \$50,000. Est. 1892. E. M. Roberts Pres. and Head of Selling Dept., William Murray, Vice-Pres. and Head of Mfg. Dept., S. W. North, Sec., Treas. and Head of office.

Chase Yacht & Engine Co.—Providence, R. I. Mfrs. Motorboats

Chasing.—The process of cutting screws on a lathe by means of a tool called a "chaser."

Chasse-loup-Laubat, Marquis Louis de.—Born at Paris, at the ministry of the marine, June 12, 1863. Chevalier of the Legion of Honor; officer of the Acad-



emy; engineer E. P. C.; manager of the Ateliers et Chantiers of the Gironde; treasurer of the Civil Engineers of France; member of the Bureau of the Maritime Technical Association; associate member of the Institute of Naval Architects of

London, and member of the managing committee of L'Auto. He took the initiative in changing the Paris-Bordeaux-Paris Committee, 1895, to a permanent committee, which M. de Dion converted into the A. C. F. He is laureate of the Society of Civil Engineers of France and founder and member of the administrative council of the A. F. C.

Chassis.—A term for the frame together with the power-plant and running gear, independently of the body of a motor-vehicle. In French it has come to mean all this, but originally it designated the frame only. See Frame.

Chateau des Beaux Arts.—Huntington, Long Island, Garage, 50 cars. Full line of automobile supplies; repairing.

Chater Lea, Ltd.—114 Golden Lane, London, E., England. Mfrs. tricars, motorcycles, transmission gears.

Chatfield, C. B.—1201 Center Ave., Bay City, Mich. (Haynes.) Est. 1904. Cap. \$50,000. Garage, 8 cars; repairing

Chatham Motor Car Co.—Chatham, Ontario Co., Canada. Mfrs. automobiles, gas.

Chattanooga Automobile Co.—Southern Hotel Bldg., Chattanooga, Tenn. (Franklin, Cadillac.)

Chatterton.—A black, pitchy material used for making insulated tape and for winding about the joints of electric wires, and also employed for cementing together sheets of gutta percha. It is composed of 100 parts of gutta percha, 30 parts of coal-tar, and 40 parts of resin.

Chauffeur.—A designation for a professional driver of a motor-vehicle, but, originally, and properly (as the name implies), a "stoker" or "fireman."

Chauffeur, Le.—Published at 9 rue Guénégaud, Paris, France.

Chauffeurs' Protection Association of America.—1947 Broadway, New York City. Organized for the purpose of protecting chauffeurs and automobile drivers in all legal matters or otherwise; to collect commissions, wages, royalties, etc.; to aid in framing laws beneficial to chauffeurs; furnish bail bonds; representing members when arrested for speed violations, etc. Edward F. Flammer, attorney for the association.

Chaufourier, M.—10 rue de Palikao, Paris, France. Mfrs. carbureters.

Chauvierre, E.—29 rue Chevallier, Levallois, France. Mfrs. tricarcs.

Chavand et Cie.—119 rue Sebastien-Gryphe, Lyons, France. Mfrs. non-skids.

Chazalnôel, Etienne.—Tarnac, Correze, France. Mfrs. motorcycles. (L'Elan.)

Chauvin et Arnoux.—186 rue Champignonnet, Paris, France. Mfrs. speed indicators.

Check.—A general name for a joint in which one part fits another.

Check-nut.—See Nut, Check.

Check-valve.—See Valve, Check.

Check.—A general term for one of the two corresponding sides or flanks of an object, as the sides of a vise or of a pulley block, etc.

Chelsea Auto Storage Co., The.—516-518-520 W. 37th St. and 517 W. 36th St. Office 520 W. 37th St. Agts.; Manhattan trucks and passenger cars. Est. 1905. Inc. 1907. Cap. \$75,000. A. M. Von, Pres. and Mgr.; F. T. Albro, Vice-Pres.; C. O. Snyder, Sec.; F. Frederick Komp, Treas. Garage, 50 cars; repair-ing.

Chelsea Clock Co.—16 State St., Boston, Mass. Mfrs. automobile clocks.

Chelsea Garage.—California Ave., Atlantic City, N. J. Garage.

Chenango County Automobile Club.—Burt W. Stover, Sec., Norwich, N. Y.

Chénard & Walcker, Société Anonyme des Anciens Etablissements.—rue du Moulin de-la-Tour, Gennevilliers, Seine, France. Mfrs. automobiles, gas. (Chénard & Walcker cars.)

Chenevert, Charles T.—Vice-Pres. Detroit Wire Spring Co., 295-305 Congress St., W., Detroit, Mich.

Chenevert, John D.—Sec. and Treas. Detroit Wire Spring Co., 295-305 Congress St., W., Detroit, Mich.

Chenoweth, W. B.—Snyder, Tex. Garage.

Chesapeake Launch & Motor Co.—Norfolk, Va. (Franklin.)

Chesapeake Motor Carriage Co.—North Ave., nr. Charles St., Baltimore, Md. (Pullman.)

Chesbro, Ernest P.—197 Pleasant St., Willimantic, Conn. (Buick, Cadillac, Waltham.)

Chesebrough, L. F.—2337 Telegraph Ave., Berkeley, Cal. (Cameron.)

Chesley, W.—Factory Mgr. American Coil Co. Inc. Cor. Wall and Cocasset Sts., Foxboro, Mass.

Chester Automobile Co.—Broad and Crosby Sts., Chester, Pa. (Cadillac, Baker.)

Chester Forging & Engineering Co., The.—Broad & Crosby Sts., Chester, Pa. Mfrs. crank shafts.

Chester Co., Jno. W.—114 3d Ave., Nashville, Tenn. (Lambert.)

Chesterton & Co., A. W.—64 India St., Boston, Mass. Mfrs. oils, packings.

Chestnut Hill Auto Garage.—199 Commonwealth Ave., Newton-Centre, Mass. Garage.

Chestnut Hill Motor Car Co.—Chestnut Ave. and Bethlehem Pike, Chestnut Hill, Pa. (Clement-Bayard.)

Chicago Art Metal Works.—67 Lake St., Chicago, Ill. Mfrs. name plates.

Chicago Automobile Club.—13-17 Plymouth Place, Chicago, Ill. Organized 1902, for the "advancement of motoring interests, local and western," and as a social down-town club. Inc. July 2, 1903. Incorporators; Samuel A. Miles, J. A. Ellis, Frank X. Mudd, John Farson, Chas. E. Bartley, Dr. F. H. Davis, Robt. Tarrant, Jr., Chas. W. Gray, W. H. Hoops, Dr. F. C. Greene. Board of Managers; Ira M. Cobe, Pres.; Frank H. Pietsch, 1st Vice-Pres.; Harry J. Powers, 2d Vice-Pres.; Sidney S. Gorham, Sec.; T. J. Hyman, Treas. Directors; John Farson, B. H. Marshall, S. K. Martin, L. E. Myers, Joseph F. Gunther, Charles E. Gregory. Standing Committees: House; Frank H. Pietsch, Chairman; S. K. Martin, N. H. Van Sicklen, W. G. Lloyd, Robert Tarrant, Jr. New Club House; W. G. Lloyd, Chairman; John R. Thompson, Frank H. Pietsch, Membership; T. J. Hyman, Chairman; Elmer H. Adams, Harry J. Powers, Auditing; Oscar G. Foreman, Chairman; Allen S. Ray, A. C. Frost, Runs and Tours; Joseph F. Gunther, Chairman; Guy G. Gibson, C. A. Coey, Racing; Charles E. Gregory, Chairman; Carroll Shaffer, C. A. Coey, Good Roads; Harry J. Powers, Chairman; Charles B. Wood, Frank K. Hoover, Legislation; Sidney S. Gorham, Chairman; Andrew R. Sheriff, L. E. Myers, Graham H. Harris, Entertainment; S. K. Martin, Chairman; B. H. Marshall, Robert Tarrant, Jr. Former Presidents; Arthur J. Eddy 1902; F. C. Donald 1902-3, John Farson 1903-4, Ira M. Cobe 1904-5, John Farson 1905-6, Ira M. Cobe 1906-7. Promoted races between Automobile Club of America and Chicago Automobile Club for Dr. Harold Thomas Trophy, 1904; race meet at Harlem, Chicago, 1905; Reliability-run, 1906;

Harlem race meet, 1907. Has aided in numerous runs and conducted club runs ranging from short jaunts to protracted tours. The St. Paul Carnival tour in 1905 was one of the principal of these.

Chicago Auto Garage Co.—3210 N. Clark St., Chicago, Ill. (Reo, Premier, Columbus.)

Chicago Auto Heater Co.—285 N. State St., Chicago, Ill. Mfrs. automobile heaters.

Chicago Auto Lamp Works.—71 W. Jackson Blvd., Chicago, Ill. Mfrs. acetylene generators, lamps.

Chicago Auto Robe Supply Co.—155-159 Market St., Chicago, Ill. Mfrs. and jobbers, fur cloth and waterproof robes, fur coats, fur gloves, fur floor rugs for automobiles, patentees of the "Spring-belt" auto drivers robes. Not inc. Est. 1905. H. L. Hoenigsberger, Mgr.

Chicago Battery Co.—Michigan Ave. and 14th St., Chicago, Ill. Mfrs. annunciators, storage batteries.

Chicago Brass Co.—Kenosha, Wis. Mfrs. brass and copper metals, rods, tubing.

Chicago by Auto Co., Inc.—247 Franklin St., Chicago, Ill. Est. 1907. Cap. \$2,500. Rental business exclusively.

Chicago Caloric Engine Co.—536 Wabash Ave., Chicago, Ill. Mfrs. marine motors, repairing.

Chicago Carriage & Trimming Co.—1908 Indiana Ave., Chicago, Ill. Mfrs. automobile tops.

Chicago Coach & Carriage Co.—1223-1231 Michigan Ave., Chicago, Ill. Makers of the Duer motorbuggy, first marketed, April 6, 1907. Mfrs. bodies (wood and metallic); tops, wind shields (glass). Cap. \$50,000. James Webster, Sec., Treas., Gen. Mgr. and Advt. Mgr.; Wm. J. Hughey, Pres.; Chas. Duer, Designer and Supt.

Chicago Commercial Auto Mfg. Co.—Chicago, Ill. Mfrs. automobiles, gas, comm.

Chicago Drop Forge & Foundry Co.—West Pullman, Ill. Mfrs. drop forgings.

Chicago Electric Mfg. Co.—435 N. Broad St., Philadelphia, Pa. Mfrs. auto-clocks.

Chicago Eye Shield Co.—143-145-147 S. Clinton St., Chicago, Ill. Mfrs. eye protectors, goggles, and eye shades. Cap. \$2,500. Est. 1896.

Chicago Flexible Shaft Co.—La Salle Ave. and Ontario St., Chicago, Ill. Mfrs. automobile heaters.

Chicago Hardware Foundry Co.—North Chicago, Ill. Mfrs. brass, bronze, aluminum and copper castings, gray iron castings.

Chicago Insulated Wire & Mfg. Co., The.—152-156 Lake St., Chicago, Ill. Mfrs. insulated electric wire.

Chicago Mica Company.—Valparaiso, Ind. Mfrs. mica.

Chicago Motor Car Co.—1615 Michigan Ave., Chicago, Ill. (Packard.)

Chicago Motor Club.—200 S. Clinton St., Chicago, Ill. Organized Sept. 10, 1906, the object being the promotion of automobilism, motor cycling and motor boating; to secure proper government of motoring; aid in the work of securing improved highways and protect its members and other motorists against unjust laws or other abuses. Charter members; O. P. Rotts, Wm. H. Arthur, Geo. G. Greenburg, and 97 others. Former presidents; Wm. H. Arthur. Present officers; F. C. Donald, Pres.; J. W. Hayden and J. F. Gunther, Vice-Pres.; Geo. G. Greenburg, Sec. and Treas. Promoted the annual hill climbing contests at Algonquin, Ill., in conjunction with the Chicago Trade Association.

Chicago Pneumatic Tool Co.—1010 Fisher Bldg., Chicago, Ill. Mfrs. air compressors, special automobile machinery, buffing machines, flexible drilling machines, tools.

Chicago Portable House Co.—4726 Shields Ave., Chicago, Ill. Mfrs. portable houses and garages.

Chicago Rawhide Mfg. Co.—75-77 Ohio St., Chicago, Ill. Mfrs. belting, rawhide gear wheels, packing, tire sleeves.

Chicago Recording Scale Co.—Waukegan, Ill. Mfrs. automobiles, gas.

Chicago Screw Co.—2 N. Canal St., Chicago, Ill. Mfrs. bolts, nuts, cups and cones, screw machine products.

Chicago Tire Club.—Secretary's address 81 Michigan Ave., Chicago, Ill. Organized, March 1907, object "sociability." Charter members; practically all Chicago representatives of tire companies. W. H. Bell, Pres.; G. E. Shugart, Sec.; A. F. Osterloh, Treas.

Chicago Tire Repair Co.—35th and Michigan Ave., Chicago, Ill. Repairing.

Chicago Trade Association.—Chicago, Ill. Organized 1903 to improve trade conditions and local selling. Joseph G. Gunther, Pres.; Henry Paulman, Vice-Pres.; W. A. Githens, Treas.; R. Dayton, Sec. Former president, Ralph Temple.

Chicago Varnish Co.—Dearborn Ave. and Henzie St., Chicago, Ill. Mfrs. varnishes.

Chicago Vulcanizing Co.—1461-1463 Michigan Ave., Chicago Ill. Vulcanizing and tire repairs. Est. October, 1905. Cap. \$20,000. H. W. Terriere, Pres.; J. W. Benton, Vice-Pres.; J. G. Boss, Sec. (Northern.) Garage, 10 cars; automobile rental service.

Chicago Women's Motor Club.—Chicago, Ill. Organized February, 1907, to increase popularity of motoring among women. Charter members: Mrs. C. H.

Foster, Mrs. N. J. Boardman, Mrs. A. F. Chase, Miss Anna M. Andrews. Officers: Mrs. W. C. Johnson. Pres.; Mrs. A. F. Chase, Vice-Pres.; Mrs. N. J. Boardman, Sec.; Miss Anna M. Andrews, Treas. Directors: Mrs. O. W. Close, Mrs. C. C. Brodie, Mrs. Mayne McKenna, Mrs. A. F. Chase, Mrs. N. J. Boardman. Former President, Mrs. C. H. Foster.

Chicot, S.—78 rue des Arts, Levallois, Seine. France. Mfrs. wood wheels, wood rims.

Childs & Co., Chas. H.—12 Lafayette St., Utica, N. Y. (Packard, Franklin, Pope-Waverley, Pope-Hartford, White, Autocar.) Garage.

Childs & Co., S. D.—200 S. Clark St., Chicago, Ill. Mfrs. license numbers, monograms, name plates.

Childs Co., O. J.—48-50 Liberty St., Utica, N. Y. Mfrs. fire extinguishers. Est. 1896. O. J. Childs, Pres.

Childs, O. J.—Pres. O. J. Childs Co. 48-50 Liberty St., Utica, N. Y.

Childs Co., The G. B.—499 Greenwich St., New York City. Mfrs. oils, metal polishes.

Childs, Walter H.—McKeesport, Pa. (Dolson.)

Chill.—A metallic mould used for chilling and casting.

Chilling.—The hardening of a casting by the use of a mould made of metal.

Chillingworth, Rud.—Nürnberg, Germany. Mfrs. pressed steel frames.

Chisel.—A steel tool with a sharp beveled end employed for chipping wood or metal, and of which there are several varieties, such as the "cape" (Fig. 1), "cold" or "chipping" (Fig. 2), "diamond-point" (Fig. 3), "flat" and "round-nosed chisel" (Fig. 4).

 Fig. 1.

 Fig. 2.

 Fig. 3.

 Fig. 4.

Chisholm, S. H.—Pres. Long Arm System Co., Lakeside Ave. and E. 38th St., Cleveland, O.

Chisholm-Phillips Automobile Co.—5906-8 Euclid Ave., Cleveland, O. (Stevens-Duryea.) Supplies, garage, repairing.

Chittenden, C. M.—Pres. Okey Motor Car Co., West Broad and Kimball Sts., Columbus, O.

Chock.—A piece of metal fastened to the deck of a boat and having jaws through which a rope or cable may pass.

Christ, E. J.—7 Franklin St., Hempstead, N. Y. Garage.

Christ, G. B.—Niagara Falls, N. Y. (Maxwell.)

Christiansen & Co., H. C.—63 St. Kon-

gensgade. Copenhagen, Denmark. Mfrs. automobiles, gas comm., motorcycles.

Christensen, N. A.—1212 Harman Bldg., Milwaukee, Wis. Mfr. fuel and air pumps.

Christenson & Co.—Galveston, Tex. (Ford.)

Christie Motor Co.—51st St. and 12th Ave., New York City. Garage.

Christopher Bros.—1049 Sheffield Ave., Chicago, Ill. Mfrs. carburettors. Garage.

Chrome Leather.—See Leather, Chrome.

Chromium.—A hard grayish-white metal (Cr.) of the atomic weight of 52.1, and density of 6.92. It is extremely hard, less fusible than platinum and is oxidizable in moist air. It is employed in metallurgy for the production of extra-hard steel. The use of chrome steel, chrome copper, etc., is becoming more and more widespread for manifold mechanical purposes. Chromium does not occur native, but exists in combination in chromite, chrome ochre, and selwynite. The salts of chromium have been employed in recent years for the manufacture of what is called "chrome leather" (q. v.), a material of which most anti-skids are made.



Chuck.—A device for holding work on the mandrel of a lathe; or for holding small drills. There are many forms.

Church, Alfred Whiting.—B. May 18th, 1877, in Elgin, Ill. Educated at Cornell. (Mechanical and civil engineering.) Oc-

cupation, Sec. Wyckoff, Church & Partridge. Director in five companies. Member of Chicago A. C., N. Y. Athletic Club, Chi Psi, Arctic, Rockford C. C., Rockford A. C., Elgin C. C., A. C. A., N. Y. Motor Club. Connected with automobile

trade since Oct. 15, 1902. Recreations. motoring, cruising, hunting, fishing. Address, 1743 Broadway, New York City.

Church & Caswell.—Narragansett, R. I. Garage.

Church, E. B.—140 W. 42nd St., New York City. Garage.

Church, E. S.—Gen. Mgr. Waltham Mfg. Co., Waltham, Mass.

Church, J. S.—Treas. Davis Mfg. Co., Milwaukee, Wis.

Church, M. Clay.—Sec. Couple-gear Freight Wheel Co., Ashton Bldg., and Sec. Holson Motor Patents Co., Pythian Temple. Grand Rapids, Mich.



Church, Melvin B.—Pres. Couple-gear Freight Wheel Co., Ashton Bldg., and Pres. and Gen. Mgr. Holston Motor Patents Co., Pythian Temple, Grand Rapids, Mich.

Church, M. J.—Sec. Davis Mfg. Co., Milwaukee, Wis.

Church Motor & Launch Co.—62 William St., New York City. Mfrs. motor-boats.

Churcher, W. B.—With Cincinnati Auto Vehicle Co., 117-21 Opera Pl., Cincinnati, O.

Churchill & Co., F. E.—52 High St., Brockton, Mass. Garage.

Churchill Cabinet Co.—72 Churchill Ct., Chicago, Ill. Mfrs. spark coil, dash coil and battery boxes. Cap. \$10,000. Est. 1904. John J. Keenan, Pres.; O. Gullicksen, Sec. and Treas.; August Heiser, Gen. Supt.

Churchill, C. W.—Mgr. New York City Branch Winton Motor Carriage Co., Broadway and 70th St.

Churchill, G. B.—Pres. Churchill Hardware Co., 238-240 Main St., Galesburg, Ill.

Churchill Hardware Co.—238-240 Main St., Galesburg, Ill. (Gale.) Est. 1882. Cap. \$20,000. G. B. Churchill, Pres.; L. L. Steele, Treas.

Churchill, N. L.—Vice-Pres. Welch Motor Car Co., Pontiac, Mich.

Churning, E. C.—Mgr. auto livery department McCook Auto Co., 308 W. Denison St., McCook, Neb.

Cia Pan-Americana de Vehiculos.—Mexico City, Mex. (Buick, Packard.)

Cia des Magnetos Simms-Bosch, Ltd.—22 rue Violet, Paris, France. Mfrs. spark plugs, magnetos.

Cimiotti Garage Co.—Broadway and 110th St., New York City. Garage.

Cincinnati Auto Co.—215-219 E. 5th St., Cincinnati, O. (Pope-Toledo, Pope-Hartford, Peerless.) Est. 1902. Cap. \$25,000. R. J. Hillenbrand, Pres.; H. O. Brunton, Sec., Treas. and Head of Sales Dept.; W. F. Meyers, Head Sundries and Supply Dept.; Wm. Wells, Head of Machine Shop. Garage, 50 cars. Repairing.

Cincinnati Electric Tool Co.—650-652 Evans St., Cincinnati, O. Mfrs. portable electric drills, grinders, blowers, motor-driven flexible shafts, electric buffing and polishing lathes. Cap. \$50,000. Est. Oct. 18, 1902. Louis Goldman, Pres.; Ben. Heidingsfeld, Vice-Pres. and Treas.; Harry Frohman, Sec.; Isider Rauh, Gen. Mgr.; Joseph Pflume, Supt.

Cincinnati Milling Machine Co.—Cincinnati, O. Mfrs. milling machines, universal cutters and tool grinders.

Cincinnati Motor Vehicle Co.—117-21 Opera Pl., Cincinnati, O. Agts. Pope-Waverley and Marmon; also Exide storage batteries. Est. January, 1906. W. B.

Churcher, Pres. and Gen. Mgr. Garage, 15 cars. Repairing.

Cinematics.—That part of mechanics in which is studied motion, independently of the forces brought into play for producing them.

Cinogène.—36 rue des Grandes-Carrières, Paris, France. Mfrs. automatic starters.

Circle-iron.—The same as fifth wheel. q. v.

Circle, Pitch.—See Pitch-circle.

Circuit.—The connecting wires and cables with receiver (such as lamp, motor, etc.) and generator forming a continuous conducting path for a current of electricity. When a "break" is made in the conductor so that a current no longer flows, the circuit is said to be "open," and when the connection is established so that the current flows, the circuit is said to be "closed."

Circuit-breaker.—A device which acts automatically to break the circuit of a storage-battery charging-plant, when too high or too low a voltage exists. (2) Another name for contact-breaker. q. v.

Circuit, Short.—A path of low resistance in an electrical circuit through which the current flows in preference to going in the right direction.

Clash-gear.—Same as sliding gear. See Gear. Sliding.

Circulating-pump.—See Pumps.

Citizen's Motor Car Co.—N. E. cor. 7th and Main Sts., Cincinnati, O. (Packard, Pierce, Cadillac, Columbus.) Est. 1906. Cap. \$150,000. I. M. Richardson, Pres.; J. W. Tarbill, Vice-Pres., Treas. and Gen. Mgr.; Robert Ramsey, Sec.; C. C. Blackmore, Office Mgr.; R. H. Thomas, Supt.; C. C. Crane, Repair Shop Foreman; Geo. Larkins, Garage Foreman. Garage, 125 cars. Repairing.

Citizen's Transit Co.—Cleveland, O. Garage.

City Automobile Co.—Crawfordsville, Ind. R. B. Irwin, Prop. Garage and supplies.

City Cycle & Auto Co.—29 Railroad St., Cortland, N. Y. Branch of Elmira Arms Co., Elmira, N. Y. Est. 1901. James A. Fawell, Mgr. Repairing.

City Hall Automobile Co.—66 Fulton St., San Francisco, Cal. (De Luxe, Auburn, American Mors.)

City Ignition Co.—14 Spencer St., Goswell Road, London E. C., England. Mfrs. spark plugs.

City Machine & Mfg. Co.—Detroit, Mich. Garage.

City Machine Co.—9-13 Orchard St., Detroit, Mich. Mfrs. axles, wood wheels.

City Motor Car Co.—1363 Bush St., San Francisco, Cal. (Stearns.)

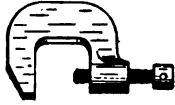
Civelli de Bosch, Ltd.—Billancourt, Seine, France. Mfrs. automobiles, gas.

Clack-valve.—See Valve, Clack.

Clamp.—An appliance used for gripping a piece of work in order to force its parts into close contact, the requisite pressure being usually applied by means of a screw. (2) Pieces of wood or soft metal fitted to the jaws of a vise for holding polished or delicate objects. (3) The internal planking of a vessel upon which the deck-beams rest.

Clamp-dog.—A lathe-dog having a pair of clamping jaws.

Clamp, Screw.—A tool used for temporarily holding together two pieces to be united, either to mark the place of holes, or to make a fac simile by file or other tool of a piece held against another. It consists of a semi-circular piece of steel, one of the extremities of which is provided with a tempered screw, which can be tightened up by hand.



Clamp-screw.—A clamp operated by a thumb-screw.

Clamp, Spring.—The same as "screw clip." See Clip, Screw.

Clampitt, Gay S.—Sec. and Treas. The Broc Co., 1665-69 E. 40th St., 4021-23 Payne Ave., Cleveland, O.

Clancy, J. F.—Western Ave., Gloucester, Mass. Garage.

Clandon, C. J.—Fairbury, Ill. Garage.

Clanton, W. H.—Montgomery, Ala. (Jewel.)

Clapp Mfg. Co., E. D.—Auburn, N. Y. Mfrs. drop forgings.

Clapp, J. Reginald.—379 S. Main St., Geneva, N. Y. (Covert.)

Clarendon Auto Station.—2001 Clarendon Ave., Chicago, Ill. Garage.

Clarion Automobile Co.—Main St., Clarion, Pa. (Jackson.)

Clark Auto Co.—1201 Main St., Anderson, Ind. (Mitchell, Maxwell.)

Clark, A. E.—4th and Ohio Sts., Huron, S. Dak. Holsman agency for S. Dak. Est. 1906. Not inc. Garage, 12 cars.

Clark, Allis.—Medina, N. Y. Garage.

Clark Automobile Co., E. R., The.—Whetstone Bldg., Brattleboro, Vt. (Buick, Cadillac, Knox.) Cap. \$5,000. Incorporators: Mortimer Stoddard, A. F. Schwenk, Kittredge Hastings, A. B. Clapp, H. E. Eddy.

Clark Auto Co., E. R.—461 Worthington St., Springfield, Mass. (Cadillac.) Garage.

Clark, B. B.—Livingston, Orange County, Fla. (Waltham.) Est. 1907. Not inc. B. B. Clark, Mechanical and Sales Mgr.; H. B. Clark, Electrical and Operating Mgr. Garage, 12 cars. Repairing.

Clark Bros. Bolt Co.—Milldale, Conn. Mfrs. bolts, nuts, washers, screws. Cap. \$100,000. Est. 1854. C. H. Clark, Pres.;

Edwin S. Todd, Sec. and Treas.; Chas. C. Persiani, Factory Supt.

Clark, Chas. B.—N. Yakima, Wash. (Waltham.)

Clark, C. D.—Torrington, Conn. (Buick, Jackson.)

Clark, C. H.—Pres. Clark Bros. Bolt Co., Milldale, Conn.

Clark, Chas. S.—Sec. and Treas, Dover Garage Co., 74 E. Blackwell St., Dover, N. J.

Clark, C. W.—Sec. Clark Novelty Co., 380 Exchange St., Rochester, N. Y.

Clark, D. A.—Mgr. Southern Automobile Co., 1200 Mt. Royal Ave., Baltimore, Md.

Clark, Ed. S.—242 Freeport St., Boston, Mass. Mfrs. automobiles, steam; marine motors; automobile parts.

Clark, Fayette C.—Vice-Pres. The Grant Mfg. Co., 90 Silliman St., Bridgeport, Conn.

Clark, Frank.—Ass't Supt. Ellwood Ivins Tube Works, Philadelphia, Pa.

Clark, Frederick A.—Main and 3rd Sts., Zanesville, O. Garage.

Clark, Geo. F.—660 Main St., Worcester, Mass. (Indian.)

Clark Glove Co., The.—Peabody, Mass. Mfrs. gloves, gauntlets, leggins.

Clark, H. B.—Electrical Operating Mgr. B. B. Clark, Livingston, Orange County, Fla.

Clark, I. G.—616 San Antonio St., El Paso, Tex. (Holsman.)

Clark, I. M., Jr.—136 Bower St., Jersey City, N. J. (Waltham.)

Clark Insulation Co., The.—186 Freeport St., Boston, Mass. Mfrs. insulated wire.

Clark, J. A.—Eastern Ave., Herkimer, N. Y. (Maxwell.)

Clark, J. M.—Casino Terrace, Newport, R. I. (Dolson, Mercedes.)

Clark, J. M.—Yoakum, Tex. (Waltham.)

Clark, John.—1005 Park Ave., Chicago, Ill. Garage.

Clark, John W.—Albany, N. Y. Mfr. brass, bronze, aluminum and copper castings, bronze metals.

Clark, J. Y.—Leesburg, Fla. (Carter-car.)

Clark, L. A. & A. T.—Cottage St., Portland, Me. Garage.

Clark, Leroy.—Pres. The Safety Insulated Wire & Cable Co., 114 Liberty St., New York City. Factory, Bayonne, N. J.

Clark, M. F.—Pres. and Treas. Clark Novelty Co., 380 Exchange St., Rochester, N. Y.

Clark Motor Co., E. C.—Jackson, Mich. Mfrs. transmission gears, gasoline automobile motors.

Clark. Novelty Co.—380 Exchange St., Rochester, N. Y. Mfrs. tire clamps,

metal specialties, brass and steel parts, brass and iron rod, sheet steel and brass. Cap. \$50,000. Est. 1890. Inc. 1898. M. F. Clark, Pres. and Treas.; C. W. Clark, Sec.

Clark, Wm. C.—Head of paint shop, Fickling & Co., Inc., 154 E. 57th St., New York City.

Clark, W. L.—Vice-Pres. Greene Motor Car Co., 88-90 Washington St., Newark, N. J.

Clark's Auto Transit Co.—20 Ocean St., Jacksonville, Fla. (Pope-Hartford.)

Clark & Co., A. F.—2130 W. Susquehanna Ave., Philadelphia, Pa. Mfrs. storage batteries.

Clark & Son, A. N.—Plainville, Conn. Mfrs. washers.

Clarke, E. P.—Arcade, Utica, N. Y. Mfrs. gasoline strainers.

Clarke, J. S.—Pres. The Autocar Co., Ardmore, Pa.

Clarke, James M.—134 Washington St., Providence, R. I. (Mercedes.)

Clarke, L. S.—Vice-Pres and Consulting Engineer, The Autocar Co., Ardmore, Pa.

Clarke, W. S.—Cor. Broad and River Sts., Milford, Conn. (Ford, Lambert.)

Clarksdale Machinery & Supply Mfg. Co.—Clarksdale, Miss. Est. 1905. Cap. \$10,000. Repairing.

Clark's Garage.—Boston Post Road, Stamford, Conn. (Winton.) Garage.

Clarkson & Oliver.—601-603 Mesquite St., Corpus Christi, Tex. Agts. Northern, Ford, Rapid. Oldsmobile. Est. 1894. Garage, 20 cars. Repairing.

Clarkson, Ltd.—Moulsham Works, Chelmsford, England. Mfrs. automobiles, steam comm.

Clasen, W. H.—Head of footwear dept. Syracuse Rubber Co., 212-214 S. Clinton St., Syracuse, N. Y.

Clayton, Geo. L.—Oakland, Cal. (Dorris.)

Clayton & Lambert Mfg. Co.—Detroit, Mich. Mfrs. brass, bronze, aluminum castings, special bearing metal castings for automobile motors, gasoline fire pots, torches.

Clayton, W. C.—Key West, Fla. (Waltham.)

Cleaner Mfg. Co.—2842-44 Olive St., St. Louis, Mo. Mfrs. metal polishes. Est. 1895. H. W. Chandler, Pres.; W. N. Chandler, Sec. and Treas.; H. W. Chandler, Mgr.

Cleanola Co.—Fulton Bldg., Pittsburg, Pa. Mfrs. body polishes and soaps.

Clearance.—The amount of space left between two parts which have to fit or engage with each other. (2) The space between a piston and the end of the cylinder in an engine when the piston is at the end of its stroke. (3) The space be-

tween the bottom of a car-frame and the ground.

Cleat.—On a boat a wood or metal



contrivance on which the free end of a rope is coiled in order to make it fast.

Cleland, H. W.—61 E. Swain St., Buffalo, N. Y. Garage.

Clement, Albert.—B. in France, April 28, 1885; d. in May, 1907, as a result of



an accident in his car while practicing for the Grand Prix. Son of Gustave Adolphe Clement, head of the Bayard-Clement concern. Began racing in 1903, in the Mont Ventoux hill climb. Competed in the fourth and fifth Bennett races and

the first Vanderbilt cup contest. In the latter, held in 1904, he was leading on the last lap, but ultimately finished second to George Heath. He finished second to Szisz in the 1906 Grand Prix, and fourth in the 1906 Vanderbilt race.

Clement, Gustav Adolphe.—33 Quai Michelet, Levallois - Perret (Seine), France. Born at Pierrefonds (Oise), Sept. 22nd, 1855. Officer of the Legion of Honor. In 1878, he established himself



at No. 20 Rue Brunel, Paris, for the manufacture of "velocipèdes." In March, 1894, he organized the Clement Société des Velocipèdes, with a capital of \$800,000. In 1895 he became directing manager of the Clement-Gladiator Com-

pany, a position which he held until October, 1904. At present he is sole owner of the Bayard-Clement car, to the manufacture of which he is devoting his entire attention. The number of workmen employed by him at present exceeds 2,000.

Clement et Gladiator, Société Française des Cycles.—Pré-St-Gervais, Paris, France. Mfrs. motorcycles.

Clément-Talbot, Ltd.—Barlby Road, Kensington, England. Mfrs. automobiles, gas (Talbot cars.)

Clemick-Hirsch Co.—594 National

Ave., Milwaukee, Wis. Mfrs. carbureters, gasoline marine motors.

Cless und Plessing.—36 Grazergrasse, Graz, Styria, Austria. Mfrs. motorcycles.

Cleveland Automobile Club.—Hollenden Hotel, Cleveland, O. Organized Jan. 8, 1900, for the promotion of the motor vehicle industry and construction of improved highways. Charter members: Walter C. Baker, Thomas Henderson, A. S. Ingalls, H. S. Pickands, Walter S. Root, F. B. Stearns, E. L. Strong, Geo. L. Weiss, Alex. Winton, Rollin H. White, Windsor T. White. Officers: Fred. T. Sholes, Pres.; A. Ward Foote, 1st Vice-Pres.; Geo. Colliester, 2d Vice-Pres.; C. J. Forbes, Sec.; W. T. White, Treas. Chairmen of committees: F. T. Sholes, Executive; F. S. Porter, Auditing; F. N. Bindelan, House; Fred. R. White, Committee of Laws; Walter C. Baker, Highways; C. K. Chisholm, Touring. Former Presidents: E. L. Strong, E. Shriver Reese.

Cleveland Automobile Trade Association.—Cleveland, O.

Cleveland-Canton Spring Co., The.—Canton, O. Mfrs. leaf springs.

Cleveland Cap Screw Co.—2216 Clarkwood Road, Cleveland, O. Mfrs. screws and bolts, valves, transmission shafts, cam shafts, truss rods, etc. Cap. \$250,000. Est. 1901. C. E. Thompson, Gen. Mgr.; J. A. Krider, Sales Mgr.; W. D. Bartlett, Supt.

Cleveland Faucet Co., The.—706 Frankford Ave. N. W., Cleveland, O. Mfrs. automobile pumps. O. Horix Sales Mgr.

Cleveland Hardware Co.—1300 Lake St., Cleveland, O. Mfrs. drop forgings, automobile tops.

Cleveland Motor Car Co.—Home office and New York Branch, 1659 Broadway, New York City. Factory, Milwaukee, Wis. Makers of the Cleveland car; first marketed in 1904. Four models made since. Cap. \$300,000. James Laughlin, Pres., Sec. and Treas.; S. W. Hartley, Engineer, Designer, Pur. Agt. and Supt.; Charles G. Percival, Sales and Advt. Mgr. Chicago Branch, 1470 Michigan Ave.; Richard Bacon, Mgr. Dealers: Colonial Auto Co., Pittsburg, Pa. Van Auto Co., St. Louis, Mo. Butler Motor Car Co., Boston, Mass. Girard Motor Car Co., Philadelphia, Pa. Crescent City Auto Co., New Orleans, La. J. W. Leavitt & Co., San Francisco, Cal. Lord Motor Car Co., Los Angeles, Cal. C. W. Poole, Seattle, Wash. Dupont Garage Co., Washington, D. C.

Cleveland Motor Car Co.—Chicago Branch, 1470 Michigan Ave., Chicago, Ill. (Cleveland.) Richard Bacon, Jr., Gen. Mgr. Repairing.

Cleveland Tanning Co.—Jennings and

Dennison Ave., S. W., Cleveland, O. Mfrs. leather.

Cleveland Varnish Co.—Cleveland, O. Mfrs. varnishes.

Cleveland Wire Spring Co.—Cleveland, O. Mfrs. waste cans, machinery springs, seat springs.

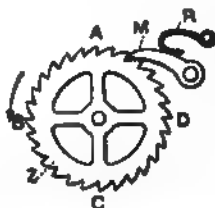
Clèves de et Chevalier.—23 ave. du Roule, Neuilly-s-Seine, France. Mfrs. automobiles, gas. (Labor cars.)

Clevis.—A fitting used for connecting two rods in such a way as to permit of relative lateral motion between them. It consists of a piece terminating in a fork containing an aperture for the reception of a pin, the function of which is to connect one clevis with another having a tongue exactly fitting between the cheeks of the fork (male clevis); the pin passing through both and being held in place by a cotter-pin or split-pin inserted in a hole



in it. Clevises are to be found on every automobile. They are also called "yoke-ends" and are usually made of metal corresponding to that of the rods of which they form part.

Click.—A pivoted catch M (see figure) arranged to fall into the teeth of a ratchet-wheel as it revolves in one direction, to prevent a back motion when the wheel-moving power is withdrawn. It may act either by gravity or a spring.



R. See Pawl and Ratchet-wheel.

Clifton, Charles.—B. Sept. 20, 1853, in Buffalo, N. Y. Educated at public schools. Occupation, Treas. The George N. Pierce Co. Pres. A. L. A. M. Pres. Association Patent Co. Director, The George N. Pierce Co., Automobile Club of Buffalo. Pierce Cycle Co. N. A. A. M. Connected with automobile business since 1898. Member Buffalo Automobile Club, Buffalo Engineers



Club. New York residence, 61 Irving Pl. Address, 1601 Elmwood Ave., Buffalo, N. Y.

Clifton Hotel Garage.—Niagara Falls, Ontario, and Upper Bridge, Niagara Falls, N. Y. Garage.

Clifton Motor Works.—265 E. Clifton Ave., Cincinnati, O. Mfrs. gasoline marine motors.

Climax Igniter Co.—Amesbury, Mass. Mfrs. magnetos and ignition dynamos, spark plugs.

Clinch.—The flange-like edge of a clincher tire; called, also, a "bead."

Clincher.—The incurved part of a rim for pneumatic tires in which the "beading" is fitted and by which the tire is maintained in place when the air pressure within causes the "beads" to expand into the clinchers.

The diameter of a clincher-rim is measured from the interior part of the clincher to a symmetrical interior point, diametrically opposite.

Cline, J. W.—Brook, Ind. (Ford.)

Clinger, E. E.—Grand Island, Neb. Repairing.

Clinker.—A term applied to the strikes of a boat when their edges overlap; sometimes spelled "clinker."

Clinton Auto Co., H. D.—Binghamton, N. Y. (Matheson.)

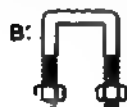
Clinton, Harry T.—B. Feb. 28, 1877, at Attlebury, Dutchess County, N. Y. Educated at Pratt Institute. Occupation, Advt. Mgr. A. L. A. M. Member: A. C. A., New York Motor Club. Residence, Dobbs Ferry, N. Y. Address 7 E. 42nd St., New York City. Owned first car in 1903.

Clinton, Louis R.—17 Carhart St., Binghamton, N. Y. (Thomas Flyer.)

Clinton, Walter R.—34 Elm St., West Haven, Conn. Garage.

Clip.—A device for clasping and holding things together, as the leaves of a spring.

Clip, Spring.—An iron clamp in the shape of a flat-bottomed U, of which the branches, B, which pass through holes in the spring-pad, are threaded for the reception of tightening nuts to hold the spring on its seat; also a clasp embracing a spring to keep the leaves from spreading.



Clipper Pneumatic Tyre Co., Ltd.—Alma St., Coventry, England. Mfrs. pneumatic tires.

Close Bros.—405 Smith St., Schenectady, N. Y. (Knox. Cadillac.) Supplies, garage, repairs.

Closset, Ch.—rue Ste-Marie, Liège, Belgium. Mfrs. bodies.

Clough, C. R.—Partner, Southern Garage Co., 35-37 W. Mound St., Columbus, O.

Clough, M. P.—Treas. Waltham Mfg. Co., Waltham, Mass.

Clouser, M. E.—New Smyrna, Fla. Repairing.

Cloutier, A. J.—Vice-Pres. Douglass & Lomason Co., 302-310 Grand River, Detroit, Mich.

Clover Mfg. Co.—228 W. 58th St., New York City. Dealer in second-hand cars. Mfrs. grinding compound.

Cowes, Chas.—Good Ground, L. I., N. Y. Garage.

Club Garage.—729 S. Main St., Akron, O. (Lambert, Queen, Glide, Plymouth.)

Cluff, Wm. A.—Mgr. Hatcher Auto Parts Co., 2108 Superior Ave. Viaduct, Cleveland, O.

Clum & Atkinson.—575 Lyell Ave., Rochester, N. Y. Mfrs. aluminum, brass, bronze, phosphor bronze, manganese bronze, white brass castings, babbitt metal, white brass, bearing metals, aluminum solder, brass unions. Est. 1883.

Clutch.—A mechanism for connecting a shaft or transmission to the motor that actuates it. A clutch therefore must not be confused with a "coupling," which provides a continuous junction. There are numerous types of clutches, each named from its form or method of engagement, such as the cone, the external contracting, the internal expanding, the multiple disk, the hydraulic, the magnetic and the pneumatic clutches. The simplest type of these is the cone-clutch, of which there are many modifications, although the principle is the same throughout. Of this, one member forms part of

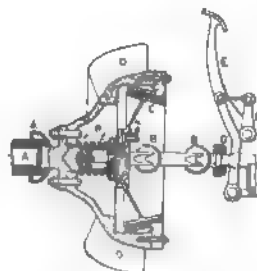


Fig. 1.

the fly-wheel, D (see Fig. 1, which represents the Renault clutch), while the other, C, is attached to the shaft, A, entering the gear-case. Such a clutch is held in place by a very stiff spring, R, which maintains a contact between the friction surfaces, one of which is faced with leather, until it is disengaged by a movement of a foot-lever, E, or the emergency brake-lever to which it is connected. In this form of clutch the wear between the two members is excessive and the clutch constantly requires adjustment. Owing to such disadvantages it has been replaced to a considerable extent by other types, such as the expanding and multiple-disk clutches.

Fig. 2 shows an internal expanding clutch of the Berliet type.

Here, the fly-wheel, V, carries in the center a hub, T, in the interior of which rub and then adhere two metallic segments, BC. The latter are joined at one point, A, in common, so that if the lever, F, be moved toward the left they will separate from each other of themselves, and that if, on the contrary, their elasticity be permitted to act, the two segments will approach each other. It will be seen that the separation of the seg-

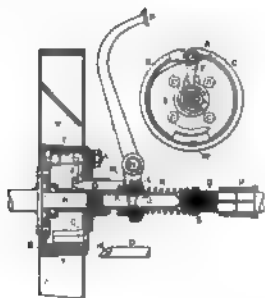


Fig. 2.

ments will be so much the greater in proportion as the displacement of the lever F to the right is more pronounced. Such displacement is effected by a finger, D, with a pointed end, which first enters, by its extreme point, the aperture to the right of the lever F, and then forces its way deeper thereinto until the full clutching is effected. The finger, I, is constantly pushed inward in the clutching mechanism by a spiral spring, R. A large lever, P N M, actuated at P by the driver's foot, and jointed at N, is pushed back, through the finger D, in order to throw the clutch out.

The multiple disk clutch, which has been adopted by some of the leading makers of motor-cars, consists of multiple disks of metal, each alternate one of which is attached by its edge to the driving-member, while the other disks are attached at their centres to the driven member, or vice versa. Light springs cause these to separate sufficiently to be clear of engagement when the clutch is released. The total amount of surface is so large that the friction co-efficient may be very small. This form of clutch runs in oil and has no appreciable wear.

Clutch, Bayonet.—A device for engaging a moving fast pulley or wheel with a loose or idle one, by means of pins or "bayonets" that act upon a friction strap.

Clutch, Coil.—A clutch in which the gripping action is obtained by the automatic tightening of a spring steel coil upon the inside of a parallel or on the outside of a conical steel drum.

Clutch, Cone.—See Clutch.

Clutch, Contracting.—See Rim-clutch.

Clutch, Crab.—A clutch called also a

"jaw clutch," in which engagement is effected by the interlocking of two oppositely toothed collars.

Clutch, Dish-pan.—The same as cone-clutch. q. v.

Clutch, Disk.—See Clutch.

Clutch, Dog.—See Crab Clutch.

Clutch, Expanding.—A clutch in which one or two segmental sections are forced outwardly against the rim of a drum.

Clutch, Hele-Shaw.—A combination of the disk and cone clutch.

Clutch, Jaw.—The same as crab-clutch. q. v.

Clutch-pedal.—A pedal for operating a clutch.

Clutch, Plate.—The same as disk clutch. See Clutch.

Clutch, Rim.—A clutch, called also a "contracting clutch," which grips the outer periphery of a rotating drum.

Clutch-spring.—A spring for throwing a clutch into engagement.

Clute, A. J.—Pres and Sales Mgr. Clute Bros., 49 Mohawk St., Cohoes, N. Y.

Clute Bros.—49 Mohawk St., Cohoes, N. Y. Agts. Pope-Hartford, Pope-Waverly, Royal Tourist. Est. 1904. Cap. \$5,000. A. J. Clute, Pres. and Sales Mgr.; V. S. Clute, Treas. and Head Repair Dept. Repairing.

Clute, V. S.—Treas. and Head Repair Dept. Clute Bros., 49 Mohawk St., Cohoes, N. Y.

Coakley, J. J.—Advt. Mgr. Babcock Electric Carriage Co., 226-242 W. Utica St., Buffalo, N. Y.

Coale, H. M.—Sales Mgr. The Autocar Co., Ardmore, Pa.

Coaming.—Raised work higher than the deck about the edges of hatch-openings, to prevent water on deck from running down.

Coates Clipper Mfg. Co.—Worcester, Mass. Mfrs. buffing machines, flexible drilling machines, flexible shaftings, turntables, universal joints.

Coatesville Garage.—3rd Ave and Main St., Coatesville, Pa. (Pope-Waverly, Winton.)

Coats, Fred N.—Asst. Sales Mgr. Dayton Motor Car Co., Dayton, O.

Cobe, Ira M.—B. Oct. 29, 1866, in Boston, Mass. Educated at public schools and Boston University Law School. Present occupation, investments. Director, Chicago Title & Trust Co., Calumet Electric Street Railway Co., Assets Realization Co., etc. Owned first car 1900. Member Chicago Athletic. Hamilton, Chicago Automobile, South Shore Country, Midway Clubs. Residence, Kenwood Hotel. Address, 100 Washington St., Chicago, Ill.

Coblenser Verein fur Luft Schifffahrt.—(Coblens Aero Club), Coblenz, Germany.

Coburn & Beldon.—577 Central Ave., Newark, N. J. (Rainier.)

Coburn Heath & Co.—1008 Boylston St., Boston, Mass. (Cameron.)

Cochaux, Emile.—Deville, Ardennes, France. Mfr. radiators.

Cochrane, Garrett.—Pres. Imperial Motor Car Co., 3rd and Locust Sts., Williamsport, Pa.

Cochrane, J. J.—Moose Jaw, Canada. (Waltham.)

Cochran, H. T.—Buena Vista, Colo. (Waltham.)

Cock.—A valve consisting of a "shell" in which turns a "plug" controlled by a "key," and designed to permit or arrest



at pleasure the flow of liquid from some containing vessel or through a pipe. It may be considered as a circular sliding valve. A cock is "two-way," "three-

way" or "four-way" (see figure), when it is so arranged that by turning the central key the liquid may be made to run in two, three or four directions.

Cock, Bib.—A tap of ordinary shape, except that the nozzle is curved downward.

Cock, Blow-off.—An important attachment to all steam boilers and furnishing a ready means of removing water from the boiler under pressure of its own steam, which is called "blowing off."

Cock, Compression.—A cock which, placed on the motor cylinder, may be opened or closed at will for the purpose of testing the compression in the cylinder and determining whether the latter is firing properly.

Cock, Compression-relief.—A cock placed on the combustion-chamber and designed to relieve part of the compression in order to permit of easy hand starting. Called, also, "relief cock." In motors of very high pressure, the compression is generally relieved at the starting by means of one or more cams, which lift the exhaust-valves slightly.



Cock, Drain.—A cock, called also a "pet cock," placed at the lowest point in the water-circulating system, and under the crank-case or the carburetter to drain

off the contents.

Cock, Gauge.—One of the small cocks in a boiler, one above and one below the proper water-level.

Cock, Grease.—A cock used for lubricating purposes.

Cock, Mud.—A cock, called also a "purge-cock," for drawing off boiler sediment.

Cock, Pet.—A small tap fitted to the ends of motor cylinders to enable water to escape before the motor is started.

Cock, Purge.—Same as mud-cock. q. v.

Cock, Relief.—The same as compression-relief cocks. q. v.

Cock, Sea.—Any cock or valve communicating through a boat's hull with the sea.

Cock, Stop.—A term often applied to any kind of cock.

Cock, Try.—One of three cocks placed one above the other on a steam generator, to show the amount of water therein.

Cock, Waste.—The same as drain cock.

Cockerill, Société Anonyme, John.—Seraing, Belgium. Mfrs. automobiles, gas comm. (Nordenfelt trucks.)

Codman & Shurtleff, Inc.—120 Boylston St., Boston, Mass. Mfrs. tire pumps, oil pumps, nipples. Est. 1838.

Coe Brass Mfg. Co.—Torrington, Conn. Mfrs. sheet iron, brass, copper, brass and copper tubing.

Co-Eck Garage Co.—Oil City, Pa. Garage.

Coefficient.—A numerical quantity (commonly obtained by experiment), which enters into a formula as a multiplier.

Coes Wrench Co.—Worcester, Mass. Mfrs. wrenches.

Coey & Co., C. A.—1424 Michigan Ave., Chicago, Ill. Agts. Thomas Flyer, Thomas Detroit. Est. 1895. Cap. \$200,000. C. A. Coey, Pres. and Treas.; Geo. B. Levy, Sec.; Andrew Ott, Vice-Pres.

Coey, Chas. A.—B. July 19, 1870, in Redfield, N. Y. Educated at country schools and New York Business College.

Pres. and Treas. C. A. Coey & Co., Chicago, Ill. Director C. A. Coey & Co., Coey Auto Livery Co. Member Chicago Automobile Club, Illinois Athletic Club, So. Shore Country Club, Columbia Yacht Club, Chicago Yacht Club, Jackson Park Yacht



Club, Rotary Club. Connected with trade since 1901. Owned first car 1890. Recreation, automobile racing. Residence, Auditorium Annex. Address, 1424 Michigan Ave., Chicago, Ill.

Coffin Bros.—515 Greene Ave., Brooklyn, N. Y. (Pierce-Racine.)

Coffin, E. C.—330 D. F. Walker Bldg., Salt Lake City, Utah. (Lambert.)

Coffin, Howard E.—B. Sept. 6, 1873, at W. Milton, O. Educated at University of



Michigan. Occupation, Vice-Pres., Designer and Engineer and Director E. R. Thomas Detroit Co. Member Detroit Automobile Club, Detroit Boat Club, American Society Mechanical Engineers, Society of Automobile Engineers. Address,

care E. R. Thomas Detroit Co. Connected with automobile trade since 1902. Owned first car in 1898. Was Chief Engineer Olds Motor Works, 1905-1906.

Coffing Bros.—Attica, Ind. (Pope-Hartford.)

Cog.—The tooth of a gear-wheel, especially a wooden tooth, or any projecting catch or lifter that serves to move another machine element.

Cog-wheel.—A wheel with teeth made to mesh with those of a similar wheel, so that movement is transmitted from one to the other. See Gear-wheel.

Cohen, Alexander.—Sec. and Treas. Bryant & Berry Co., 34 W. Atwater St., Detroit, Mich.

Cohen & Co., Inc., Frank.—136 W. 23rd St., New York City. Factory, 765-771 Stone Ave., Brooklyn, N. Y. Mfrs. Boots.

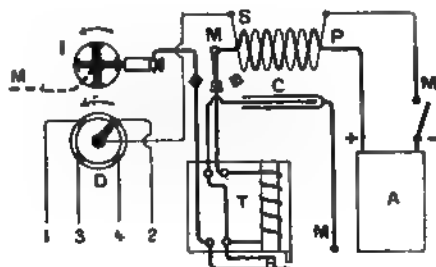
Cohendet, A et Cie.—166 quai Jemappes, Paris, France. Mfrs. automobiles, gas comm. (A. Brétin trucks.) Steering gears, transmission gears, automobile motors.

Cohoes Automobile Club.—E. R. Clifton, Sec., Cohoes, N. Y.

Cohoes Auto Storage & Repair Station.—42 Van Rensselaer St., Cohoes, N. Y. Garage.

Coil.—In automobilism, the term "coil" used alone designates the "induction coil" or "transformer" employed for spark-plug ignition by batteries or accumulators. The low tension primary current from the battery is transformed into a high tension secondary current capable of jumping across the gap between the electrodes of the spark-plug. By virtue of the principle of the conservation of energy, it is very evident that the power of the secondary current cannot be greater than that of the primary. It is, in fact, less; what is gained in tension being lost in energy. The value of the e. m. f. induced in a current depends upon the number of spirals and upon the value of the flux of force cut in a unit of time. In dynamos the field is constant. The value of the flux is varied by cutting at a variable angle, so as to embrace a

variable number of lines of force. But the same results are obtained if the spirals are fixed and the value of the field variable. It is this latter mode of induction that is applied in the induction coil, which consists of a bundle of soft iron wires, surrounded by two separate windings, the first of coarse insulated wire. This wire is connected to the battery through a switch and commutator or timer. Around this coarse wire winding, termed the primary winding, is a secondary winding of several thousand feet of finer insulated wire, known as the secondary winding. Between the primary and secondary winding there is no connection. In fact, the windings are insulated from each other. One extremity of the fine wire is grounded and the other leads to the spark-plug. To every closing or breaking of the primary circuit there corresponds an inverse or direct induced current, which is made manifest by a spark at the plug. On account of the self-induction of the primary, the direct induced current (that which corresponds to a breaking) is of much higher tension than the inverse current and alone passes to the spark-plug. The coil is provided with a condenser, composed of a number of layers of tin-foil, separated by paraffine paper, and the object of which is to absorb the self-induced current of the primary winding, and thus prevent it from opposing the rapid fall of the current. It has become quite common to provide the spark-coil with an automatic or mechanical trembler, which sets up a vibrating motion



and produces a series of "fat," hot sparks, instead of one spark, at the plug. the instant the timer makes the circuit. With the trembler the very quick parting of the timer contact is not essential. Generally, there is one spark-coil unit for each cylinder of the motor, although usually the units are carried in a single box on the dash. By having a secondary distributor, it is possible to use one coil to ignite a 4-cylinder motor. Among the advantages of such a system are that the ignition is synchronous, the number of electrical connections is reduced and there is but one coil to adjust.

The figure gives a diagram of a wiring scheme for a 4-cylinder engine, where but one coil is used. Here, A is the bat-

tery, P the primary wire, S the secondary wire, I the commutator, D the distributor, C the condenser, T the trembler coil, M the grounded extremity of the secondary wire, and 1, 3, 4, 2 wires going to the spark-plugs.

Coil-clutch.—See Clutch, Coil.

Coil, Idle.—A coil in certain forms of armature which, at a given instant, has no induced e. m. f. acting in it.

Coil, Intensity.—The same as induction coil.

Coil, Quad.—An abbreviation of "quadruple coil," that is, four individual coils for sparking a 4-cylinder motor, enclosed in a box placed upon the dashboard.

Coil-radiator.—See Radiator.

Coil, Resistance.—A coil of wire (usually of German silver or platinum) of known electrical resistance, used for measuring resistance.

Coil, Ruhmkorff.—The same as induction coil.

Coil, Trembler.—A coil, called also a "vibrator coil," provided with a trembler for making and breaking contact. See Trembler.

Coil-vaporizer.—See Vaporizer, Coil.

Coindet, A.—137 ave. Gambetta, Paris, France. Mfrs. clutches.

Coir.—See Fiber, Cocoa.

Coit, S. J.—21 Chestnut St., Norwich, Conn. Garage.

Coke.—A product of the destructive distillation of coal. It is very hard, and a good conductor of heat and electricity. Among its uses is that of the preparation of pencils for electric arc-lamps, carbon plates for battery cells, and similar articles. The higher grades of such objects, however, are made from coke derived from the residue of petroleum stills. See Carbon.

Colbun, Web.—Sec. Dorris Motor Car Co., 22-38 S. Sarah St., St. Louis, Mo.

Colburn Automobile Co.—Denver, Colo. Mfrs. automobiles, gas.

Colburn Automobile Co., E. A.—15th St. and Colfax Ave., Denver, Colo. (Locomobile, Rauch & Lang, White.

Colby, F. A.—Head of Taxidermy Dept. S. L. Crosby & Co., 186 Exchange, Bangor, Me.

Colby, John W.—Norwalk, Conn. Garage.

Cold Chisel.—See Chisel. Fig. 2.

Coldewey, W. G.—Cincinnati, O. (Frayer-Miller.)

Cole, C. D. W.—Sec. and Treas. Automobile Owners' Supply Depot. 1655 Broadway, New York City.

Colegroove & Rollins.—South Side, Garret, Ind. Repairing.

Cole, J. C.—Vice-Pres. The Fisk Rubber Co., Oak St., Chicopee Falls, Mass.

Cole, Jos.—Patton, Pa. (Elmore.)

Cole, S. R.—39 E. 3rd St., Dunkirk, N. Y. Garage.

Cole, S. W., & Roebke, Wm.—Detroit, Mich. (Reo.)

Cole & Son.—Rockford, Ill. (Ford, Mitchell.) Mfrs. bells.

Cole & Whoop.—50 W. 67th St., New York City. Mfrs. tops, glass fronts, bodies, motor pans. Est. 1896. Geo. N. Cole, Pres.; Wm. Woop, Designer.

Coleman, A. C.—Garage Foreman Lakdel Auto Co., 5143 Delmar Blvd., St. Louis, Mo.

Coleman & Sons, Walter.—300 S. Water St., Providence, R. I. Mfrs. gasoline marine motors.

Coleman, Chas. S.—Treas. Continental Rubber Works, 19th and Liberty Sts., Erie, Pa.

Coleman, Galen.—11 Academy Ave., Middletown, N. Y. Garage.

Coleman, J. C.—234 Jefferson Ave., Detroit, Mich. Mfrs. steering wheels.

Coleman, John G.—Red Wing, Minn. (Waltham.)

Coleman, R. L.—Chairman of Board, National Battery Co., Buffalo, N. Y.

Colfax, R. L.—Pur. Agt. The North Pennsylvania Iron Co., 3rd and Venango Sts., Philadelphia, Pa.

Colgan Co., J. W.—Sudbury Bldg., Boston, Mass. Mfrs. monograms.

Colgan, Peter.—Sec. New Haven Button Co., New Haven, Conn.

Collar.—A metal ring attached to, or formed integral with, a spindle or shaft, and generally employed to prevent movement of the spindle in the direction of its length or axis, or of a piece of machinery along the spindle.

Collar-bearing.—See Bearing, Collar.

Collar, Compensating.—A ring or collar on a shaft that can be adjusted so as to take up wear. It is used especially in machines in which there is a longitudinal thrust on the shaft.

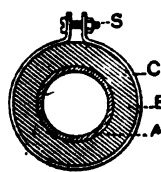
Collar, Pinch.—A clamping band C (see figure) placed around a rubber tube B, to hold it in place on the piping A of a water circulating system.

Collar, Thrust.—A ring or collar on a bearing which takes the longitudinal thrust in the propeller-shaft.

Collaton, Michael.—Foreman J. E. Lonergan & Co., 211-15 Race St., Philadelphia, Pa.

College St. Garage.—College St., Toronto, Canada. Repairing.

Collier, C. E.—Sec. and Treas. White Agency, 176 State St., Binghamton, N. Y.



Collier Tyres.—127 Long Acre, London, W. C., England. Mfrs. pneumatic tires.

Collier, William E.—Designer and Supt. Racine Boat Mfg. Co., Riverside, Muskegon, Mich.

Collignon, Julio.—Guadalajara, Mexico. (Mitchell.)

Collinge, J. Walter.—Riverside, Cal. (Queen.)

Collings, T. C.—Supt. Peerless Motor Car Co., 93rd and Quincy Ave., Cleveland, O.

Collingwood Garage Co.—Collingwood and Bancroft Ave., Toledo, O. Garage.

Collins & Co., D. P.—432 7th Ave., Pittsburg, Pa. (Columbia.)

Collins & Son, G. A.—Akron, O. Mfrs. automobile tops.

Collins Bros.—Steubenville, O. (Mitchell.)

Collins, Daniel.—Main St., Marcus, Ia. Garage.

Collins, J. M.—Purch. Agt. Knox Automobile Co., Springfield, Mass.

Collinson, M.—1253 Michigan Ave., Chicago, Ill. Mfr. automobile tops.

Collison's Garage.—Cor. Church and Maple Sts., Burlington, Vt. Garage, repairs, supplies.

Collister, Geo.—Co-Partner, Collister & Sayle, 224 Superior Ave., N. W., Cleveland, O.

Collister & Sayle.—224 Superior Ave., N. W., Cleveland, O. Est. 1893. Dealers in automobile supplies. Geo. Collister and W. F. Sayle Co-Partners, B. E. Hewitt, Head of automobile supplies dept. Agency for Prest-o-Lite tanks, Weed chain tire grips, Warner auto meters, Solar lamps, Gray & Davis lamps.

Colliy Bailo.—8 passage de la Paz, Barcelona, Spain. Mfrs. radiators.

Collmer Bros.—105 Vestula Ave., South Bend, Ind. Mfrs. sprockets.

Colonial Auto Co.—3944 Olive St., St. Louis, Mo. (Reo, White.)

Colonial Automobile Co.—5518-5520 Walnut St., Pittsburg, Pa. (Aerocar, Cleveland, Pungs-Finch, Baker, Cartercar, Brasier.) H. W. Klein, Pres.; H. N. Miller, Sec.; R. C. Succop, Treas. Directors: D. N. Miller, R. H. Mueller, J. H. Shaffer.

Colonial Auto Garage.—50-52 E. 39th St., Chicago, Ill. Garage.

Colonial Brass Co.—316-318 Seneca St., Cleveland, O. Mfrs. tire pumps.

Colonial Garage.—Narragansett Pier, R. I. Supplies, garage, repairs.

Colonial Garage.—220 W. 30th St., New York City. Est. 1905. John E. Lloyd, owner. Second-hand cars. Garage, 60 cars; repairing.

Colonial Rubber, Société Anonyme.—Grand Nord, France. Mfrs. pneumatic rubber tires.

Colorado Automobile Club.—214 Col-

burn Bldg., Denver, Colo. Member A. A. A. Organized May 15, 1902. Object, "Mutual protection of autoists." F. L. Bartlett, Pres.; Dr. J. W. O'Connor, Vice-Pres.; Louis Searing, Treas.; W. H. Bergtold, Sec. Former President, D. W. Brunton. Membership composed of the following: Canon City A. C., Longmont A. C., Weld County A. C.

Colorado Automobile Co.—1510 Court Pl., Denver, Colo. (Cadillac.)

Columbia Bridge Co.—Pittsburg, Pa. Mfrs. iron and steel bar, steel shafting.

Columbia Cyclery.—114 Circle, Palo Alto, Cal. (Winton.)

Columbia Electric Co.—Knightstown, Ind. Mfrs. automobiles, gas.

Columbia Engineering Works.—William and Emlay Sts., Brooklyn, N. Y. Mfrs. automobiles, steam comm.

Columbia Garage, Inc.—327 Front St., Spokane, Wash. (Cadillac, Winton.)

Columbia Insurance Co. of New Jersey.—Franz Herrmann, Vice-Pres. and Mgr. 37 Wall St., New York City. Automobile fire insurance.

Columbia Lubricants Co. of New York.—78 Broad St., New York City. Mfrs. monogram oils and greases. Cap. \$100,000. Est. 1902. H. J. Hall, Jr., Pres.; J. W. Knight, Treas.; C. R. Burke, Vice-Pres.; R. H. Gay, Sec.

Columbia Motor Vehicle Co.—74 Stanhope St., Boston, Mass. (Columbia.)

Columbia Nut & Bolt Co.—1500 Railroad Ave., Bridgeport, Conn. Mfrs. lock nuts. Member M. & A. M. Est. 1903.

Columbia Paint & Varnish Co.—12 Sandford St., Buffalo, N. Y. Mfrs. paints.

Columbia Road Auto Station.—610 Columbia Road, Boston, Mass. Garage.

Columbia Smelting & Refining Co.—365-367 West St., New York City. Mfrs. pig lead, spelter, solder, tin, babbitt metal, white brass, metal alloys. Not inc. Est. 1883. S. A. & M. Soloman, co-partners.

Columbia Smelting & Refining Works.—307 Water St., New York City. Mfrs. brass and copper metals.

Columbia Steel Co.—Elyria, O. Mfrs. steel, chrome-nickel steel.

Columbus Automobile Club.—C. A. Howell, Sec., Columbus, O.

Columbus Automobile Exchange.—1780 Broadway, New York City. Garage.

Columbus Bolt Works.—162 W. Randolph St., Columbus, O. Mfrs. bolts, nuts, drop forgings, metal trimmings.

Columbus Brass Co.—Columbus, O. Mfrs. brass, bronze, aluminum and copper castings.

Columbus Buggy Co.—10th and Main Sts., Los Angeles, Cal. (Columbus.)

Columbus Buggy Co.—Minneapolis, Minn. (Columbus.)

Columbus Buggy Co.—Dublin Ave. W., Columbus, O. Makers of the Columbus

electric car; first marketed 1903. C. D. Firestone, Pres.; J. F. Firestone, Vice-Pres.; C. E. Firestone, Sec.; O. H. Perry, Treas.; R. S. Fend, Supt. Auto Dept.; Dave W. Henry, Gen. Representative.

Columbus Electricitäts Gesellschaft.—Ludwigshafen-am-Rhein, Germany. Mfrs. primary batteries.

Columbus Machine Works.—Columbus, Ind. Garage.

Columbus Malleable Iron Co.—Columbus, O. Mfrs. malleable iron castings.

Columbus Screw & Machine Co.—Columbus, O. Mfrs. axles, screw machine products, steering apparatus, turntables, universal joints.

Columbus Varnish Co.—Columbus, O. Mfrs. varnishes.

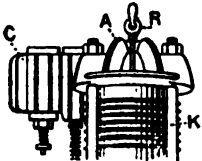
Colver & Beale.—Kinsley, Kan. (Cadillac.)

Colvin, E. F.—Milton, Pa. (Cadillac.)

Colvin, James A.—Prop. Standard Metal Work Co., Thompsonville, Conn.

Combustion.—A physico-chemical phenomenon caused by the combinations of various simple or compound bodies. A typical example is afforded by the phenomena of oxidation. As examples of combustion may be mentioned: (1) Quick combustion, like that of alcohol in oxygen, which takes place with the production of a bright light and a characteristic elevation of temperature; and (2), slow combustion, such as that of alcohol by air in the presence of finely divided platinum, which takes place gradually without a characteristic rise of temperature or heat. In internal combustion motors supplied by gasoline or alcohol, air, after having been intimately mixed with the fuel by the carburetter, enters the motor-cylinder, wherein, through the elevation of temperature caused either by an abrupt compression ("self-ignition"), or by a flame, an incandescent body, or an electric spark, rapid combustion occurs, followed by a powerful expansion of the heat thus produced.

Combustion-chamber.—In a gas-motor, the space (called also "combustion-head") in the cylinder, not swept by the piston, in which the gas is first compressed and



then fired by the spark.

Combustion, Spontaneous.—The oxidation of a substance so rapidly as to generate sufficient heat to ignite it. Oily rags and cotton waste are particularly liable to burst into flame from this cause. Such material should, therefore, never be allowed to accumulate, nor be kept in a confined space, such as a toolbox, for any length of time.

Comiot, C.—87 bvd. Gouvion St. Cyr. Paris, France. Mfrs. tire pumps, horns.

Commelin et Cie., R. Vian.—45 rue Levis, Paris, France. Mfrs. storage batteries.

Commercial Acetylene Co.—80 Broadway, New York City. Mfrs. acetylene tanks.

Commercial Automobile Co.—1353 Garfield Bldg., Chicago, Ill. Mfrs. automobiles, gas.

Commercial Auto & Supply Co.—1313 New York Ave., Washington, D. C. (Wayne.)

Commercial Auto & Supply Co.—862 N. Howard St., Baltimore, Md. Garage.

Commercial Battery Co.—204-206 Michigan St., Chicago, Ill. Mfrs. sparking and all types of storage batteries. Cap. \$15,000 (paid in). Est. January, 1907. W. A. Tichenor, Pres.; N. L. Latham, Sec. and Treas.

Commercial Motor Car Co.—Times Bldg., Times Sq., New York City. Automobile engineers. Est. 1905. Cap. \$25,000. Inc. New York State. Paris S. Russell Pres.; Frederick A. Rumpf, Sec. and Treas.; Arthur J. Slade, Engineer. (Safir truck.)

Commercial Motor Car Co.—4390 Olive St., St. Louis, Mo. (Reliance.)

Commercial Motor Co.—Marion, N. J. Mfrs. automobiles, gas comm.

Commercial Motor, The.—Published at 15 Rosebery Ave., London, England.

Commercial Motor Truck Co.—Plymouth, O. Mfrs. automobiles, gas comm.

Commercial Storage Battery Co.—140 W. Jackson Blvd., Chicago, Ill. Mfrs. storage batteries.

Commercial Truck & Power Co.—171 Main St., Rahway, N. J. Mfrs. automobiles, steam comm.

Commercial Truck Co. of America.—1222 Arcade Bldg., Philadelphia, Pa. Mfrs. automobiles, electric comm. H. S. Kerbaugh, Pres.; Frank Brown, Sec. and Treas.; J. M. Hill, Gen. Mgr.; L. A. Terrell and E. R. Whitney, Engineers; A. J. Doty, Supt.

Commercial Truck Co. of N. E.—255 Atlantic Ave., Boston, Mass. (Commercial.)

Commercial Vehicle, The.—Pub. monthly at 1402 Broadway, New York City by H. E. Donaldson.

Commergnat, A.—Auxerre, Yonne, France. Mfrs. metallic wheels.

Commission Auto Co.—1602 Michigan Ave., Chicago, Ill. Garage.

Commission Automobile Co.—742 7th Ave., New York City. Garage.

Common, G. W.—Sec. and Treas. Keystone Electrical Instrument Co., 9th St. and Montgomery Ave., Philadelphia, Pa.

Commonwealth Rubber Co.—Reading, Mass., and 1001 Flatiron Bldg., New York City. Mfrs. rubber cloths, pneumatic tires.

Commutator.—The device by which an alternating current produced in the rotating coils of a dynamo-armature is converted into a direct or continuous current in the rest of the circuit. (2) Another name for timer. q. v.

Commutator, Ignition.—An electrical device, called also a "distributor;" (1) for switching the current of an ignition system in and out of the electrical circuit at the proper time; (2) for transferring the battery current successively from one cell to another; and (3) for varying the point of time of ignition of the explosive charge in the combustion-chamber. See Timer, Current-breaker and Distributer.



Campagne, Belges de Construction, d'Automobiles.—10 rue Ruysdael, Brussels, Belgium. Mfrs. automobile motors, automobiles, gas. (Pipe cars.) Automobiles, gas comm.

Compagnie de Construction Mechaniques.—80 rue Jan-Breydel, Berchem-Anvers, Belgium. Mfrs. transmission gears, differential gears, automobiles, gas. (Royal Star), motorcycle motors, motorcycles.

Compagnie de l'Industrie Electrique et Mecanique.—Geneva, Switzerland. Mfrs. automobiles, gas (C. I. E. M.), automobiles, electric (Thury).

Compagnie des Magnetos Simms-Bosch, Ltd.—22 rue Violet, Paris, France. Mfrs. low and high tension magnetos.

Compagnie Duplex.—Ferriere-la-Grande, Nord, France. Mfrs. automobile motors.

Compagnie Française de Voitures Electromobiles.—49-51 rue Cardinet, Paris, France. Mfrs. automobiles electric.

Compagnie Française Westwood.—86 rue Eugène-Caron, Courbevoie, Seine, France. Mfrs. metallic rims.

Compagnie Generale des Refroidisseurs Vendome.—2 rue Danton, Levallois, France. Mfrs. radiators.

Compagnie Parisiennes des Voitures Electriques.—45 bvd. de Valmy, Paris, France. Mfrs. automobiles electric, automobiles, electric comm. (Krieger cars); omnibus and trucks.

Compania Mexicana de Vehiculos Electricos.—Primera Humboldt 12, Mexico City, Mex. (Locomobile. Mercedes, Panhard, Columbia, Pope-Toledo, Pope-Hartford, Cadillac, Atlas trucks, Clement-Bayard.)

Companion-way.—The stair-case or berthing of the ladder-way to the cabin of a vessel.

Compass.—An instrument used by mariners for determining direction. It is arranged in a box called a "binnacle." The magnetic needle, delicately poised on an agate socket, is attached to the lower side of a card, on which is printed the star of 32 points; the cardinal points being N. S. E. W. The compass-box is hung on "gimbals." By this method of supporting the box, it always remains horizontal, however the vessel may roll.

There are two kinds of compasses used on motor-boats. The one preferable is the mariner's "liquid compass," the larger sizes of which are the best. One four inches in diameter is about as small as can be depended upon, although the two and three-inch are often used by small boats.

Compensating-brake.—See Brake, Compensating.

Compensating-carburetter.—See Carburetter.

Compensating-collar.—See Collar, Compensating.

Compensating-gear.—See Gear, Differential.

Compensating-joint.—See Joint, Compensating.

Component.—In theoretical mechanics the components of a force are the various separate forces, which, acting together, would produce the same result as the given force. A force may be split up into any number of components. (2) A single separate part of a machine or structure.

Compound, Allumage Electrique.—Levallois, Seine, France, Mfrs. electric lamps, spark plugs.

Compound, Allumage Electrique.—135 ave. de Villiers, Paris, France. Mfrs. storage and primary batteries, compound batteries.

Compound Engine.—See Engine, Compound.

Compression.—The second period of the 4-period cycle. The piston forces the gas admitted and compresses it just at the moment at which the ignition is about to occur.

As a general thing, in an explosion-motor, of whatever kind it may be, the compression should be as high as possible (without, however, reaching the degree at which self-ignition would occur), since the efficiency and specific power of the motor is thereby increased. Thus, with a pressure of 60 pounds to the square inch, at the completion of its compression-stroke, the efficiency of the motor is about 37, that is to say, 37 per cent. of the fuel value of the charge is transformed into work of the engine. With 100 pounds pressure, the efficiency is increased to 45. Low compression means absence of sufficient gas mixture to give a good power effect.

If the compression be good it will prove almost impossible to turn even a 6 h.p. motor against the compression by hand. It therefore becomes necessary to provide a method of partially relieving the compression during starting operations, and for such a purpose there is mounted on the combustion chamber a small relief-cock, which may be opened to any extent required.

The danger of pre-ignition limits the compression to about 80 or 90 pounds, which, if desired, may be ascertained by means of a pressure-gauge screwed into the combustion-chamber.

In a multi-cylinder motor, each cylinder may be tested for compression by opening the cocks of all the other cylinders in succession and trying with the starting handle. (2) The "cushioning" or shutting in of a small amount of steam in a cylinder just before the return stroke after the exhaust-port is closed. (3) The reduction of the length or other dimensions of a body by the application of external force.

Compression Igniter.—See Igniter, Compression.

Compression-space.—The space in the cylinder above the piston, when the latter is at the inward end of its stroke.

Compression - stroke.—The piston movement which compresses the charge in an internal combustion motor.

Compression-tap.—The same as "relief cock." q. v.

Comptes Rendus de L'Academie des Sciences.—Pub. in Paris, France.

Comptoir des Ressorts de Carrosserie, Société Anonyme.—80 rue Taitbout, Paris, France. Mfrs. springs.

Comptoir d'Innovations Pour Automobiles.—16 Ave. de la Grande Armée, Paris, France. New York office, 1693 Broadway. Mfrs. tire pumps, air compressors, exhaust whistles.

Comson, S. A.—Sec. E. Keeler Co., 3rd and West Sts., Williamsport, Pa.

Comstock, B. B.—Supt. Gilbert Mfg. Co., New Haven, Conn.

Comstock Shock Absorber Co., The.—1661 Broadway, New York City. Mfrs. shock absorbers. Est. 1907. Herbert C. Comstock, Gen. Mgr.; W. A. Moody, Mgr. Branch, 10 Columbus Ave., Boston, Mass.

Concannon, J. H.—Pub. The Auto Bulletin, 821 Prudential Bldg., Newark, N. J.

Concord Motor Car Co., The.—64 Huntington Ave., Boston, Mass. Agts. Waltham-Orient line. Est. 1906. Cap. \$10,000. S. K. Dingle, Pres.; J. E. Savell, Vice-Pres. and Gen. Mgr.; J. S. P. Alcott, Sec.; F. Alcott Pratt, Treas.

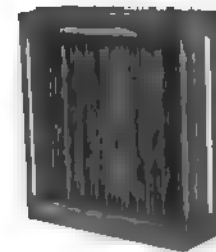
Condensation.—In chemistry, the union of two or more molecules, which may be the same or different, to form a

new molecule, the occurrence generally, but not always, being accompanied with the splitting off of water, alcohol, etc. Substances that induce this kind of change are termed "condensing agents." In physics, generally, the reduction of a gas or vapor to its liquid form by cold or pressure, or both combined; but, specifically, in electricity, the increase in an electric charge obtained by means of two conductors separated by a dielectric.

Condensation, Initial.—The condensation of steam on first entering a cylinder. The loss of steam thus caused is largely preventing by keeping the cylinder hot by means of a steam-jacket.

Condenser.—An apparatus usually composed of thin sheets of tin-foil separated by sheets of paraffined or waxed paper. Each alternate leaf of tin-foil projects beyond one end of the package, while the other leaves project at the opposite end. They are then connected so as to form a package of alternate layers of tin-foil separated from each other by sheets of paraffined or waxed paper, each layer being connected with a platinum contact of the vibrator.

The object of the apparatus is to reduce the sparking on the platinum contacts of the vibrator or contact-maker, and also to intensify the spark at the plug by rendering the make - and - break more prompt. (2) On a steam-car, an apparatus consisting



of a number of vertical thin brass tubes (see figure), into which the exhaust steam of the engine enters through a "header," and from which the water of condensation is returned to the tank by the back pressure.

Condon, Dr. C. M.—Carroll, Ia. (Waltham.)

Conductance.—The constant quantity for a given electrical conductor. It is the reverse of resistance, and is, in a manner, the conducting power of the conductor. It is expressed in "mhos," the term "mho" being an anagram of "ohm," the unit of resistance.

Conduction.—The transmission of heat, electricity, or sound through matter without motion of the affected body as a whole.

Conductivity.—In physics, the relative capacity of substances for heat and electricity. The reverse of specific resistance or "resistivity." The electric conductivity of a metal is measured in its relation to silver; that of silver being taken as 100, copper is 94, aluminum 55, and iron 16. See Electricity and Resistance.

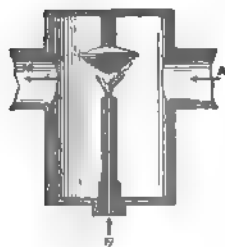
Conductor.—A body capable of conducting electricity, heat, or other form of energy. A body is said to be a good or bad conductor of electricity, according to the less or greater resistance that its own mass offers to the transmission of the current, and according to the relative ability which it possess of preserving the charge that has been communicated to it. Air, glass, rubber, resin, silk, sulphur, etc., are bad conductors and, consequently, insulators. All the metals, water, the human body, the earth, etc., are good conductors. (2) A wire, in most cases copper (which offers but slight resistance) employed for transmitting an electric current from one point to another. Such a wire is either naked or covered with some insulating material such as rubber, thread, tarred cloth, etc. two halves of the bearing may be drawn together when the bearing becomes loose through wear. (2) A rod used for connecting one machine element to another.

Cone-bearing.—See Bearing.

Cone-clutch.—See Clutch.

Cone, Pulley.—Called also simply "cone." See Pulley.

Cone, Spraying.—A grooved or



striated metallic cone, called also "mushroom," placed in some carburettors just above the spray-tube, and against which the spirting gasoline impinges and is spread out in a thin mist

through which the incoming air must pass, thus assuring more perfect vaporization of the gasoline.

Cone, Truncated.—A cone of which the vertex has been cut off in a plane at right angles with its axis.

Coney, Edward.—Mgr. The Ohio Blower Co., 330 Prospect Ave. N. W., Cleveland, O.

Congdon, Arthur G.—Vice-Pres. and Head of Trimming Dept., Graves & Congdon Co., Oak St., Amesbury, Mass.

Congdon, S. H.—Vice-Pres. Baird-Banks Mfg. & Supply Co., Inc., 203 Broadway, New York City.

Congress Square Auto Station.—18 Forest Ave., Portland, Me. Garage.

Conical Spring.—See Spring, Conical.

Conklin, H. B.—Sec. and Treas. Sprague Umbrella Co., Norwalk, O.

Conklin, L. W.—Asst. Sales Mgr. Packard Motor Car Co., Detroit, Mich.

Connecticut Automobile Association.—Hartford, Conn. Member the A. A. A. W. T. Fuller, Hartford, Pres.; F. T. Staples, Bridgeport, Vice-Pres.; B. R. Hertzberg, Stamford, Treas.; G. K. Dus-

tin, Hartford, Sec. Membership composed of following: A. C. of Bridgeport, A. C. of Hartford, A. C. of New Britain, A. C. of Stamford, Yale University A. C.

Connecticut Electric Equipment Co.—15 Church St., Meriden, Conn. (Corbin.)

Connecticut Gauge Co.—Norwich, Conn. Mfrs. speed indicators.

Connecticut Motor Car Co.—Main St., Windsor Locks, Conn. (Columbia.)

Connecticut Motor Car Co.—321 Garden St., Hartford, Conn. Garage.

Connecticut Steel & Wire Co.—308 Pearl St., Hartford, Conn. Mfrs. auto trunk racks, trunks, combination adjustable automobile seats. Cap. \$50,000. Est. 1905. C. W. Ferguson, Pres. and Treas.; Chas. W. Phelps, Sec. (Reo.)

Connecticut Supply Co.—Hartford Life Insurance Bldg., Hartford, Conn. Mfrs. vehicle washing apparatus.

Connecticut Telephone & Electric Co., Inc.—70 Britannia St., Meriden, Conn. Mfrs. spark coils, timers, switches, volt and ampere meters, coil current indicators, gasoline tank gauges. Member M. & A. M. Est. 1893. Cap. \$45,000. E. C. Wilcox, Pres.; B. L. Lawton, Vice-Pres. and Treas.; B. C. Rogers, Sec.

Connecting-plug.—A metallic plug used to join two parts of an electric circuit.

Connecting-rod.—In an internal combustion motor, a rod which connects the piston with the crank; in a steam engine, a rod that connects the piston with the crank through the intermedium of a cross-head. The figure represents the connecting-rod of an internal combustion motor. The connecting rods of such motors are generally of I-section and are drop forged from steel. The "big end" of the rod is provided with two white-metal or bronze bearings bushed with hardened steel or babbitt metal, while the "little end" has bearings of bronze, white-metal or steel. Both ends are usually made adjustable so that the



Connection.—A wire with a terminal soldered at each end, used to connect pieces of electrical apparatus.

Connell, W. J.—36 Columbus Ave., Boston, Mass. Supply house, carrying lamps, coils, speedometers, tire cases, etc. Est. 1905.

Connerat, R. V.—18 E. State St., Savannah, Ga. (Buick, Stevens-Duryea, Baker, Autocar.)

Connersville Motor Vehicle Co.—Connersville, Ind. Mfrs. automobiles, gas.

Connolly Carriage Works, Thomas.—7th and Iowa Sts., Dubuque, Ia. Mfrs. wood and metallic bodies.

Connor, B. F.—S. Main St., Wilkes-barre, Pa. (Indian.)

Connor, Geo. M.—Sec. and Director, Willyoung Appliance Co., Ludlow Station, Yonkers, N. Y.

Conover Motor Car Co., The.—Pater-son, N. J. Mfrs. glass wind shields, au-tomobiles, gas. (Conover cars), agts. Ford.

Conrad Bros.—318-320 Linden St., Scranton, Pa. (Reo. Ford.)

Conrad, E. A.—Purch. Agt. The Elec-tric Launch Co., Ave. A and North St., Bayonne, N. J.

Conrad, G. A.—819 Magnolia St., San Antonio, Tex. (Reo.)

Conrad, Geo. E.—Ass't Mgr. Winton Motor Carriage Co., 246-248 N. Broad St., Philadelphia, Pa.

Conroy, Phillips F.—39 Annandale Rd., Newport, R. I. (Columbus.)

Consolidated Bicycle & Motor Co., Ltd.—185 Notre Dame E., 224 Logan Ave. and 849 Main St., Winnipeg, Can. Est. 1901. Inc. Jan. 1, 1907. Cap. \$60,-000. C. Gordon Cruikshank, Pres.; C. L. Cruikshank, Vice-Pres. and Head Sales Dept.; F. L. P. Small, Sec. and Treas.; C. G. Cruikshank, Purch. Agt.; Wm. Pelham, Head Repair Dept.; J. St. Mars, Head Sales Dept. Automobile repair-ing.

Consolidated Mfg. Co.—Toledo, O. Mfrs. motorcycles, drop forgings.

Consolidated Motor Co.—148 W. 56th St., New York City. Mfrs. automobiles, gas, commercial; motor boats.

Consolidated Rubber Tire Co.—Fac-tory, Akron, O. Main office, 39 Pine St., New York City. Mfrs. solid tires. Branches and dealers: 243-245 W. 47th St., New York City; 11-13 Hawkins St., Boston, Mass.; 435 Wabash Ave., Chi-cago, Ill.; 315 N. Broad St., Philadel-phia, Pa.; 2334 Olive St., St. Louis, Mo.; 294 Jefferson Ave., Detroit, Mich.; 641 Main St., Cincinnati, O.; 366 12th St., Oakland, Cal.; Cook and 3rd Aves., Ak-ron, O.

Consolidated Wagon & Machine Co.—Salt Lake City, Utah. (Buick, Colum-bus, Knox, Northern.)

Constant.—A quantity of which the value does not vary. The term "con-stant" is employed under very different circumstances. Thus, when in a formula a co-efficient has an invariable value, it is said of it that it is a "constant." In like manner we may use the term "constants" of a motor when speaking of its bore, its stroke, its normal velocity, etc. These are, in fact, very constant quantities.

Constantine Manufacturing Co.—Con-stantine, Mich. Mfrs. magnetos and ig-nition dynamos.

Constricting-brake.—Same as band-brake. See Brake, Band.

Constricting-clutch.—See Clutch, Con-stricting.

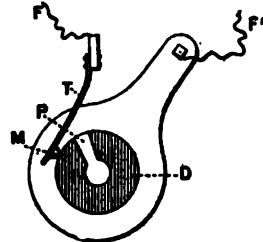
Contact.—A contact or contact-piece

is a piece of metal which "makes" the circuit; for example, the platinum con-tacts on the "contact-maker."

Contact-arm.—A lever, sometimes called a "hammer," which, in some forms of make-and-break ignition apparatus, is operated upon by the interrupter-catch and breaks contact with the igniter.

Contact-breaker.—A device, called also a "circuit-breaker," "commutator" and "timer" for interrupting the electric cir-cuit of an ignition system. See Commu-tator, Distributer and Timer.

Contact-maker.—A device used with a trembler coil for causing a spark to arc or jump between the points of the spark-plug in the combustion-chamber of a mo-tor. It consists of a disk, D (see figure), of some insulating material, generally vulcanized fiber or ebonite, rigidly se-cured to the half-speed shaft. Set into a portion of the edge is a contact-piece of brass, P, from which a connecting-wire is carried to the half-speed shaft, so as to make a continuous connection. A small spring, T, terminating in a piece of metal, M, rubs on the surface of the disk, and, once in every revolution, comes into contact with P. The spring is connected



to the pillar of the contact-breaker or vi-brator on the induction-coil, by a copper wire which passes thence through the primary to the battery and back again to the engine frame. For a short period in each revolution of the half-speed shaft, the contact-breaker, on the induction-coil, will be trembling, and sparks will be passing between the terminals of the sec-ondary. This device is sometimes called a "wipe-contact."

Contact-plug.—The same as Cut-off-plug.

Contact-screw.—See Screw, Contact.

Contact, Wipe.—The same as Contact-maker. q. v.

Contal.—64 ave. de la Grande Armée, Paris, France. Mfrs. tricar. (Mototri-Contal.)

Conte, J.—38 rue des Panoyaux, Paris, France. Mfrs. chains.

Continental Auto Co.—93 Jefferson Ave., Grand Rapids, Mich. (Dolson.)

Continental Auto Co.—168 E. 75th St., New York City. Garage.

Continental Auto Mfg. Co.—St. John and Olive Sts., New Haven, Conn. (American Mercedes, Continental, Co-

lumbus.)

Continental Automobile Co.—St. John and Olive Sts., New Haven, Conn. Makers of the Continental car. First marketed January, 1906. Three different models marketed since. Cap. \$100,000. C. A. Moeller, Pres. and Mgr.; L. R. Kautz, Sec.; R. S. Rhymann, Supt.

Continental Caoutchouc Co.—43 Warren St. and 2100 Broadway, New York City. Mfrs. and agts. Continental tires, tire tubes and tire accessories. Cap. \$60,000. Est. 1903. Willy Tischbein, Pres.; Wm. Knauth, Treas.; E. S. Williams, Sec.; Joe M. Gilbert, Gen. Mgr.; P. O. Echhardt, Office Mgr.; J. H. Sheldon, Sales Mgr.; C. G. Waldemann, Adjustment Mgr.; F. A. Lural, Cashier. Stanley Brooks, Mgr. Detroit, Mich., branch. W. A. Rutz, Mgr. Buffalo, N. Y., branch. F. S. Cutsler, Mgr. New York branch. H. W. Bogen, Mgr. San Francisco and Los Angeles, Cal., branches. Agts. Excelsior Supply Co., Chicago, Ill.; F. O. Sawyer, St. Louis, Mo.; Continental Agency Co., Cleveland, O.; Jas. L. Gibney & Bro., Philadelphia, Pa.; Post & Lester, all New England territory.

Continental Caoutchouc und Guttapercha Co.—Hanover and Seelze, Germany. Mfrs. Continental pneumatic tires, solid tires and non-skids. Est. since 1872. Factory covers many acres, employing 6,000 workmen and nearly 300 foremen, together with a large clerical force. One of the first European companies to house their employees in model dwellings, establish insurance funds, pension society, etc.

Continental Drive.—The same as Double-chain Drive.

Continental Motor Car Co.—West End Ave. and 20th St., Chicago, Ill. Mfrs. automobiles, gas.

Continental Motor Mfg. Co.—Muskegon, Mich. Mfrs. gasoline automobile and marine motors, transmissions, clutches. Cap. \$225,000. Est. 1903. Member M. & A. M. A. W. Tobin, Pres.; Benj. F. Tobin, Sec. and Treas.; R. W. Judson, Vice-Pres.; G. M. Ritchie, Supt. W. Tobin, Pres.; Benj. F. Tobin, Sec. and Treas.; R. W. Judson, Vice-Pres.; G. M. Ritchie, Supt.

Continental Rubber Works.—19th and Liberty Sts., Erie, Pa. Mfrs. automobile sundries, inner tubes, vulcanizing materials, automobile and motorcycle tires, mechanical rubber goods of all kinds. Member of A. & A. M. Cap. \$200,000. Est. July 1, 1903. T. R. Palmer, Pres. and Gen. Mgr.; Alex. Jarecki, Vice-Pres.; Chas. Jarecki, Sec.; Chas. S. Coleman, Treas.

Continental, Société Anonyme.—146 ave Malakoff, Paris, France. Branch of Continental Caoutchouc and Guttaper-

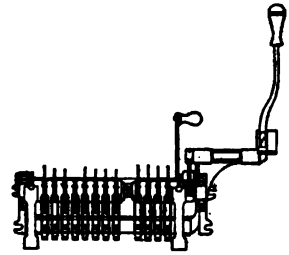
cha Co., Hanover, Germany. Solid and pneumatic tires and non-skid bands.

Contracting-clutch.—See Clutch, Contracting.

Contractors Electric Co.—9 Prospect St., Mt. Vernon, N. Y. Garage.

Converter.—In metallurgy, the pear-shaped vessel used in converting cast iron to steel in the Bessemer process. See Steel. (2) In electricity, a device called also a "transformer," by which a small current of high voltage or pressure is converted into a larger current at a lower voltage.

Controller.—A device by which the



speed of an electric vehicle is regulated by moving a lever backward and forward. This lever moves a commutating switch consisting of a revoluble, insulated cylinder upon which are arranged a number of contacts, making various circuits by being rotated into connection with brushes rubbing against them. To the terminals of these brushes are connected the accumulator, terminals, motor brushes, field and armature windings, rheostats, etc. The ordinary type of controller is usually arranged in such a way as to give four speeds ahead and two reverse. An "off position" cuts out the motor and connects the batteries in series for recharging. The figure represents the Pope controller.

Convection.—The passage of heat through liquids and gases by the actual motion of streams of heated particles, which, being lighter than the surrounding fluid, tend to rise as "convection currents." Convection usually plays a more important part than conduction in the spread of heat through a fluid. Water, for example, is so bad a conductor that if a comparatively short column be heated at the top, the upper layers can be made to boil while the lower layers are kept almost at the freezing point.

Honey-comb radiators lose much heat by convection, and little by radiation, while with finned-tube radiators the reverse is the case. To the coil-gilled radiator, as well as to the honey-comb, is adapted a fan which plays the part of a convection apparatus by the generation of currents of air that prove particularly efficacious for the cooling of motors while the car is at a standstill.

Converter, Rotary.—A machine by which a continuous current is changed into an alternating one, or vice versa; both currents traverse the same armature winding. The same as "rotary transformer."

Cook & Co., R. W.—1253 Michigan Ave., Chicago, Ill. (Royal Tourist.)

Cook & Spring.—440 Drayton St., Savannah, Ga. Repairing.

Cook & Stoddard.—22nd and P Sts., N. W., Washington, D. C. (Pierce Arrow, Franklin, White, Baker, Cadillac, Darracq.)

Cook Auto Carriage & Implement Co.—Orlando, Fla. (Buick, Cadillac.)

Cook, Benj., & Clark, Chas. J.—Sandwich, Mass. Garage.

Cook, C. E.—New London, Ia. (Holsman.)

Cook, E. D.—Gen. Supt. Salisbury Wheel & Mfg. Co., Jamestown, N. Y.

Cook Electric Garage.—144' Pacific Ave., Long Beach, Cal. Garage.

Cook, Eugene.—Pres. Cook's Standard Tool Co., Kalamazoo, Mich.

Cook, Fred W.—Niles, Mich. (Northern.) Est. 1905.

Cook, George.—Supt. Geo. N. Pierce Co., 1651 Elmwood Ave., Buffalo, N. Y.

Cook, H. F.—117 Main St., San Antonio, Tex. (Ford, Reo.)

Cook, H. H.—16 Baldwin St., Malden, Mass. Garage.

Cook, Le Roy.—B. Feb. 24, 1884, at Wadena, Minn. Educated at public schools. Occupation, on Editorial staff, Automobile Topics and International Motor Cyclopaedia. Address, Times Bldg., Times Sq., New York City.

Cook Machine Co.—Rushville, Ind. Garage.

Cook Motor Car Co.—15th and Washington Sts., Portland, Ore. (Autocar, Royal, Stevens-Duryea.)

Cook Motor Car Co.—Seattle, Wash. (Stevens-Duryea.)

Cook's Standard Tool Co.—Kalamazoo, Mich. Mfrs. automobile jacks, standard, single and double acting. Member M. & A. M. Cap. \$40,000. Est. since 1894. Eugene Cook, Pres.; F. C. Butler, Sec.

Cooley, B.—Pres. and Treas. Galena Auto & Garage Co., cor. 9th and Main Sts., Galena, Kan.

Cooley, G. W.—Sec. Galena Auto & Garage Co., cor. 9th and Main Sts., Galena, Kan.

Cooley Mfg. Co.—Waterbury, Vt. Mfrs. gasoline, marine motors.

Coolican, Oscar.—Sec. and Treas. The Auto Garage Co., Inc., 146-148 W. 39th St., New York City.

Cooling, Cylinder.—See Cylinder-cooling.

Coombs, E. H.—Mgr. Michigan Top Co., 17 Duffield St., Detroit, Mich.

Coon, Charles.—Head Mechanician Empire State Motor Car Co., 2148 Broadway, New York City.

Coon, Wm.—13th St., Lincoln, Neb. (Maxwell, Reo.)

Cooney & Ames.—Tremont, Ill. (Glide.)

Cooney Automobile Co.—Toledo, O. Garage.

Coop, Leonard G.—Riverside, Cal. (Maxwell.)

Cooper, Chas. S.—254 Clinton Ave., Newark, N. J. (Atlas.)

Cooper Hewitt Electric Co.—220 W. 29th St., New York City. Mfrs. and jobbers, mercury vapor lamps. Charles B. Hill, Vice-Pres. and Gen. Mgr.; Charles A. Terry, Sec. and Treas., 111 Broadway, New York City.

Cooper, I.—864 Bedford Ave., Brooklyn, N. Y. Repairing.

Cooper Process Co.—506 White Bldg., Buffalo, N. Y. Mfrs. paints.

Coops Co., C. W.—3 Appleton St., Boston, Mass. Mfrs. automobile seats, top fixtures, metal trimmings.

Co-ordinate.—A member of a system of lines or angles by means of which, as elements of reference, position is determined in relation to certain fixed lines or planes.

Copal.—A name applied to a number of semi-fossil resins, the most esteemed variety of which is the Sierra Leone. The resin is used in the manufacture of varnishes for carriage bodies and other purposes.

Cope.—The upper part of a mould.

Copeland & Taylor.—221 W. Washington St., Pontiac, Ill. Garage. (Jackson, Northern.)

Copeland, C. B.—Sec. and Mgr. Mason Car Sales Co., 3130 Main St., Kansas City, Mo.

Copelin, J. E.—223 W. 8th St., Los Angeles, Cal. (Holsman.)

Coppa Fratelli.—3 Piazzale Genova, Milan, Italy. Mfrs. motorcycles.

Copper.—A brownish-red metal of the atomic weight 63.6. It is fusible at about 1800° F. (1000° C.), is very ductile and malleable, and the best conductor of electricity, and, next to silver, the best conductor of heat known. In dry air it undergoes no change, but in moist air becomes covered with a film of carbonate of copper, called "patina." Hydrochloric acid has scarcely any action upon it. Sulphuric acid does not act upon it in the cold, but in a hot concentrated state forms copper sulphate and sulphur dioxide. Its true solvent is nitric acid (except when very pure) or "aqua fortis." In a pure state it is largely used in the

construction of electrical apparatus, and for making piping, wires, etc. In combination with tin it forms "bronze" (q. v.), and, with zinc, "brass" (q. v.). The principal salt of copper is the sulphate.

Copper Sulphate.—A white solid which readily absorbs water and becomes blue, forming what is commonly called "blue vitriol" or "blue stone" ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$). Crystallized copper sulphate is obtained from solutions of copper sulphate in water by allowing it to crystallize. On a large scale it is obtained from copper pyrites. It is used in the electrolytic deposition of copper, for making the exciting fluid of the Daniell cell, and for the closing of fissures in the sides of motors.

Copper, White.—A synonym for German silver. q. v.

Coppins, George T.—Sec. Walworth Mfg. Co., 128-138 Federal St. Boston, Mass.

Coppock, L. W.—Supt. Coppock Motor Car Co., Decatur, Ind.

Coppock Motor Car Co.—Decatur, Ind. Makers of the Coppock car. First marketed June 15, 1907. Cap. \$100,000. M. E. Brackett, Pres.; Harry Ward, Vice-Pres.; H. F. Reynolds, Sec.; W. H. Wiley, Treas. and Gen. Mgr.; L. W. Coppock, Supt.; E. P. Smith, Designer. Dealers: Morley Auto Co., 220 S. Spring St., Los Angeles, Cal.

Corbaley & Thorpe Auto Co.—443 Emerson St., Palo Alto, Cal. Agts. Autocar, Columbus, Sunset, Maxwell. Est. 1902. Cap. \$25,000. H. G. Corbaley, Pres.; Roy P. Thorpe, Sec. and Treas. Garage, 30 cars. Repairing.

Corbaley, H. G.—Pres. Corbaley & Thorpe Auto Co., 443-449 Emerson St., Palo Alto, Cal.

Corbett, E. J.—Director Maxwell Briscoe Motor Co., Tarrytown, N. Y.

Corbin Motor Vehicle Corporation.—New Britain, Conn. Makers of the Corbin car. First marketed 1903. Nine different models made since. Cap. \$200,000. Howard S. Hart, Pres.; Maxwell S. Hart, Vice-Pres. and Treas.; Buell B. Bassette, Sec. and Asst. Treas.; A. N. Manross, Designer; H. F. Bailey, Supt.; A. N. Abbe, Pur. Agt. Branch: Corbin Motor Vehicle Corp. of N. Y., 1888 Broadway, New York City, D. A. Harrington, Jr., Mgr. Agts. and dealers: Auto Repair Co., 557-61 7th Ave., Pittsburg, Pa. Bird-Sykes Co., 1470 Michigan Ave., Chicago, Ill. Buckeye Auto Station, Southport, Conn. Corbin Motor Vehicle Corp. of New York, 1888 Broadway, New York City. C. R. Dench, 455 W. 11th St., Erie, Pa. Genesee Motor Vehicle Company, Rochester, N. Y. Jordan Automobile Co., 217 S. 4th St. S., Minneapolis, Minn. Koehler, H. J. Sporting Goods Co., 845 Broad St., New-

ark, N. J. Kimball Co., E. T., Motor Mart, Park Sq., Boston, Mass. La France Motor Car Co., Elmira, N. Y. Maltby, W. S., Plainfield, N. J. Middleton Motor Car Co., 550 Golden Gate Ave., San Francisco, Cal. Norcross-Cameron Co., 57 Bridge St., Springfield, Mass. Phelps, George H., 38 Central St., Worcester, Mass. Pugh Bros., 15 Snow St., Providence, R. I. Perkins, Robert, Rockaway, N. J. South Side Automobile Co., 2339 S. Grand Ave., St. Louis, Mo. Wilcox, E. B., Meriden, Conn.

Corbin Motor Vehicle Corporation of New York.—Broadway and 62nd St., New York City. (Corbin.)

Corbin Screw Corp., The.—New Britain, Conn. Mfrs. screws, nuts, bolts, cones, motorcycle brakes, hubs, special screw work of all kinds. Cap. \$400,000. Est. 1855. Inc. July 1, 1903. Chas. Glover, Pres.; C. A. Earl, Vice-Pres.; T. E. Smith, Treas.; W. J. Surre, Sec. Branches: Chicago, Dayton, New York, Philadelphia.

Corcoran Lamp Co.—1712 Reading Rd., Cincinnati, O. Mfrs. lamps.

Corduoy Road.—A road made of closely placed logs, laid crosswise.

Cordz, Henry.—Austin, Tex. (Pungs-Finch.)

Core.—In a spark-coil, the bundle of soft iron wires over which the primary wire is wound. (2) A form of sand or loam placed in a mould and around which the metal is poured.

Core, G. W.—High St., Columbus Grove, O. (Mitchell.) Est. 1906. Not inc. G. W. Core, Proprietor. Garage, 10 cars. Repairing.

Cork.—The cambium of the cork oak. *Quercus suber*, of South France, Italy, and Spain. Cork possesses remarkable insulating properties, due essentially to its chemical composition and the presence of "suberine," an alkaloid isolated by Chevreul, who differentiated it from cellulose in that it is not alterable in damp surroundings. It is remarkable for its elasticity and lightness and is employed for carburettor floats, for facing gaskets, and making inserts for disk clutches, etc.

Cork Inserts.—Cushions of cork inserted into a series of holes in a metal-to-metal clutch in order to prevent the plates from gripping too "fiercely" and causing the car to start with a jerk.

Cork, Rock.—A light colored variety of asbestos. See Asbestos.

Corkhill, Thomas.—Supt. Gearless Transmission Co., Rochester, N. Y.

Corkran, H. W.—12 S. Maryland Ave., Atlantic City, N. J. (Columbus, Autocar.)

Corkran & Meloney.—12 S. Maryland Ave., Atlantic City, N. J. Garage.

Corliass Engine Works.—Providence, R. I. Mfrs. drop forgings.

Corliass, J. B.—Sec. Reliance Motor Car Co., 89 Fort St., E. Detroit, Mich.

Corn Belt Auto Co.—Waterloo, Ia. (Reo.)

Cornell, W. J.—Treas. Pioneer Auto Co., 901-925 Golden Gate Ave., San Francisco, Cal.

Cornell, W. W.—West New Brighton, Staten Island, N. Y. (Maxwell.)

Cornett, Gardner.—Vice-Pres. American Steam Gauge & Valve Co., 220 Camden St., Boston, Mass.

Cornilleau et Sainte Beuve.—67 bvd. Bessières, Paris, France. Mfrs. automobiles, gas. (Cornilleau et Sainte Beuve cars.)

Corning Auto Co.—45 W. Market St., Corning, N. Y. (Franklin, Cadillac, Holsman.)

Cornish-Friedberg Motor Car Co.—1233 Michigan Ave., Chicago, Ill. (Autocar, Gale, Cornish-Friedberg.) Mfrs. automobiles, gas.

Corominas, Ricardo.—45 Torrente de la Olla, Gracia, Barcelona, Spain. Mfrs. radiators.

Conora Fahrradwerke und Metallindustrie Actien Gesellschaft.—Brandenberg, Germany. Mfrs. motorcycles. (Corono.)

Corré, Compagnie Française des Automobiles.—Neuilly-sur-Seine, France. Mfrs. automobiles, gas, and automobiles, gas comm. (Corré cars.)

Corriveau, G., Jr.—Ass't Mgr. British Columbia Auto Co., 924 Granville St., Vancouver, B. C.

Corrosion.—A destruction of the surface of a metal by chemical action.

Corrugated.—Having alternate ridges and furrows. See Iron, Corrugated.

Corry Motor Club.—W. Edw. Marsh, Sec., Corry, Pa.

Corson, Myron L.—Springfield, Mass., and 110 Huntington Ave., Boston, Mass. (Mitchell.)

Corston, C. H.—Jefferson Ave., Detroit, Mich. Garage.

Cortland Automobile Co.—151 S. Main St., Cortland, N. Y. (Cadillac, Franklin.)

Cortland Carriage Goods Co.—Cortland, N. Y. Mfrs. bow sockets, metal trimmings.

Cortland Forging Co.—Cortland, N. Y. Mfrs. bow sockets, drop forgings, top fixtures, metal trimmings.

Cortland Specialty Co.—176 Railroad St., Cortland, N. Y. (Maxwell.) Mfrs. brazing compound.

Corundum.—A native sesquioxide of aluminum Al_2O_3 . A mineral next to the diamond in hardness and the massive form of which yields "emery." q. v. The finer colored and crystalline varie-

ties yield such gems as the ruby, sapphire and amethyst.

Coryell, Charles.—Bay City, Mich. (Mitchell.)

Coryell, R. S.—Union Bldg., Clinton St., Newark, N. J. Garage.

Cory, W. L.—Sec., Treas., Gen. Mgr., Purch. Agt., Sales and Advt. Mgr. Albany Automobile Co., Albany, Ind.

Corzine, W. T.—Litchfield, Ill. (Waltham.)

Cosby, W.—2602 S. Main St., Los Angeles, Cal. (Premier.)

Costa Motor Car Co., M. J.—Philadelphia, Pa. (Clement-Bayard.)

Coster, Maurice.—Gen. Mgr. Société Anonyme Westinghouse (American branch), 11 Pine St., New York City.

Cotta, Chas.—Rockford, Ill. Mfr. differential gears.

Cotter.—A tapering pin or wedge used for tightening up and fixing parts of machinery.

Cotter, Spring.—A piece of half-round wire folded together, forming an eye at one end, to be inserted in a bolt, to prevent the nut from coming off.

Cotter-way.—A tapered slot through which a cotter passes.

Cottereau Établissements.—Lentilleries, Dijon, France. Mfrs. tricars, automobiles, gas comm., motorcycle motors, motorcycles.

Cottet Frères.—11 quai de l'Hospital, Morez, Jura, France. Mfr. goggles.

Cottin & Desgouttes.—Place du Bachut, Lyon-Montplaisir, France. Mfrs. automobiles, gas. (Cottin & Desgouttes cars.)

Cotton, Gun.—A substance called also "pyroxylin," not unlike cotton in appearance, prepared by the action of concentrated sulphuric and nitric acids on cotton. With the addition of camphor it forms "celluloid." q. v.

Cotton, Spun.—Cotton spun into strands employed for caulking the seams of motor-boats.

Cotton-waste.—The refuse of cotton manufacture, used for cleaning machinery, and as a packing material.

Couach, et fils, J.—39 bvd. d'Haussez, Arcachon, Gironde, France. Mfrs. marine motors.

Couderc, H.—11 rue Bouret, Paris, France. Mfrs. speed indicators.

Coughing.—"Coughing at the carburetter" is a term used for explosions through the apparatus due to too weak a mixture.

Coulomb.—The quantity of electricity conveyed by a current of one ampere (q. v.) in one second.

Coulomb, Law of.—In electro-statics the force between two charges of elec-



tricity is proportional to their product, and inversely proportional to their distance apart. This may be summed up in the following simple formula:

$$f = k \frac{qq^1}{d^2}$$

identified with that of Newton's law; q and q^1 representing the electric charge of each body, or quantity of electricity that it possesses, d their distance, and k a constant function of the medium in which the actions considered are exerted. In the air $k=1$.

Coulter, J. F.—Main St., Saybrook, Conn. Garage.

Coulthard & Co.—Preston, England. Mfrs. automobiles, steam comm.

Council Bluffs Automobile Club.—T. S. Farnsworth, Sec. and Treas. Council Bluffs, Ia.

Counter.—The curved part of a vessel's stern.

Counterbore.—To enlarge a round hole at one end.

Counter, Revolution.—A small apparatus which is placed at the end of a shaft in motion or in proximity to a rotating part of a machine to measure the number of revolutions made in a given time.

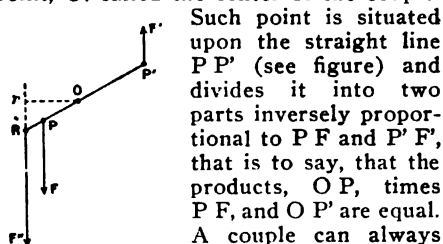
Ccountershaft.—See Shaft, Counter.

Countersink.—To form a recess at the top of a drilled hole for the reception of a screw or bolt head, after the bolt has been screwed home, is said to be "countersunk." (2) A tool for countersinking, as a drill or conical-pointed punch.

Coupé.—A vehicle with a closed body, and an inside seat for two persons and an outside one for driver. A three-quarter coupé is a closed vehicle with side entrance, and two opposite seats, accommodating four persons. Its form differs from the two-passenger coupé by the addition of a bay in front of the body.

Couper, G. H.—Gen. Foreman Eclipse Machine Co., Elmira, N. Y.

Couple.—A system of two parallel forces applied at two different points and having opposite directions. A couple tends to produce a rotation of the body to which it is applied around a point, O , called the center of the couple.



Such point is situated upon the straight line PP' (see figure) and divides it into two parts inversely proportional to PF and $P'F'$, that is to say, that the products, OP , times PF , and OP' are equal. A couple can always be replaced by a single force such as RF , provided such force be parallel to the primitive forces and that we have $RF \times OR$ equal to the sum

of the products OP times PF and $O'P'$ times $P'F'$. This lever arm of the single force RF is measured by the perpendicular OR of the force by its lever arm. This product is called the "moment" of the couple. A couple is motive or resistant, according as it produces or consumes work. We may say the motive couple of a turbine, of a gasoline motor, of an electric motor, and the resistant couple of a fan, of a brake, or of a dynamo. (2) In electricity the term "couple" is applied to two dissimilar metals joined so that a difference of potential shall be established between them under the action of an external calorific or chemical energy. In the first case we have a "thermo-electric couple," and, in the second, an "electro-chemical" one. In the second case, which is by far the more important, there is reason for considering the "primary couples" in which the chemical energy is converted into electricity, and the "secondary couples" which are reversible, that is to say, that the passage of a current therein produces a chemical action which, on becoming annulled, will afterward give rise to a current. To the first group belong "primary cells" ($q.v.$), and and to the second belong "secondary cells" ($q.v.$) or "accumulators." Primary cells are therefore generators properly so-called, while secondary or storage cells (accumulators) are merely reservoirs of energy in which is accumulated the energy that they will restore later on, chemical action being in them only an intermediary. (3) In physics a "couple of forces" is a system of two equal parallel forces, acting toward contrary parts. A couple possesses the remarkable property of being incapable of being balanced by any single force whatever. Thus, when a couple is applied to a body, a motion of rotation, not of transition, is produced.

A couple is motive or resistant, according as it produces or consumes work. Thus, we may say the motive couple of a turbine, gasoline motor, electric motor, etc., and the resistant couple of a fan, brake, dynamo, etc.

Couple, Motor.—The "motor couple" is measured in erg-centimetres (C. G. S. system), or in kilogrammetres (practical units).

The power in kilogrammes per second produced by a motor will always be equal to the product of the motor couple in kilogrammetres by the angular velocity or number of revolutions per second. This applies to all direct rotary motors.

Couple of Rotation.—The "couple of rotation" is constant in what are called rotary motors (steam and gas turbines and electric motors), while it passes through zero twice per revolution (dead-

point) in piston-engines (steam and explosion motors). From the standpoint of regularity of motion and balancing (absence of vibration), motors of the first category are therefore the more desirable.

The expression of the work developed by a couple, F (see figure), revolving by an angle, α is given by $T=2rF\alpha$ where r is the radius. We know (see "Force") that the movement of the couple is equal to abF , that is to say, to $2rF$. The work is therefore $T=M\alpha$.

If we express the power developed, that is to say, the work in a unit of time, we have $P=M\omega$; in which ω is precisely the value of the angular velocity. We can therefore say that the power developed by a couple F is equal to the product of the motive moment by the angular velocity $P=M\omega$.

The starting occurs as soon as the value of the motive moment exceeds that of the resistant moment, represented in an automobile by the friction of the driving wheels of the vehicle upon the ground.

Couple-Gear Freight Wheel Co.—Ash-ton Bldg., Grand Rapids, Mich. Mfrs. electric commercial automobiles. First marketed July, 1906. Cap. \$500,000. Melvin B. Church, Pres.; Alfred J. Brown, Vice-Pres.; M. Clay Church, Sec.; Wesley W. Hyde, Treas.; Karsten Knudsen, Designer and Supt.; H. Groudahl, Asst. Supt.; J. W. Brown, Mgr. Dealers: Mississippi Valley Automobile Co., St. Louis, Mo. Auto Motor Car Co., Cincinnati, O.

Coupling.—A device for connecting pipes or rods, or for connecting any two pieces of mechanism so that they can operate in unison.

Coupling, Elbow.—See Elbow.

Coupling, Face-plate.—A coupling called also a "flange coupling, consisting of two castings, with flat flanges, by means of which two shafts can be connected by bolts.

Coupling, Flexible.—Same as Universal joint. See Joint, Universal.

Coupling, Friction.—A coupling in which two parts are caused to rotate together by the friction between the two halves of the coupling.

Coupling, Oldham.—A kind of universal joint that permits of slightly incorrect alignment, as well as want of parallelism in the shaft which it connects.

Coupling, Reducing.—A pipe-coupling for connecting one pipe to another of different diameter.

Coupling-sleeve.—See Sleeve. Coupling.



Coupling, Union.—A pipe or rod by which the two pieces can be united without turning anything but the coupling.

Coupling, Universal.—The same as Universal Joint" or "Cardan Joint." See Joint.

Courtenay, Dr. W. A.—Hancock, Mich. Garage.

Courty, A.—30 rue du Pont, Nully-sur-Seine, France. Mfrs. wood wheels.

Cousins & Howland.—Hanford, Cal. (Mitchell.)

Couteau, H.—95 rue d'Angouleme, Paris, France. Mfrs. lubricators.

Couverchel, V.—55 qui de Boulogne, Boulogne, France. Mfrs. automobiles, gas. (C. V. R. cars.)

Couzens, James.—Sec. and Treas. Ford Motor Co. B. Chatham, Ont., Aug. 26, 1872. Ed. school and business college. Director Ford Motor Co., Ford Motor Co. of Canada, Ltd. Mem. clubs: Fellowshipcraft A. C., Detroit, Detroit Curling Res., 80 Chanler Ave., Detroit, Mich. Office, Ford Motor Co., Detroit, Mich. In the automobile trade since 1903. Used first car July, 1903.

Covell, Herbert C.—Pres. Parkway Garage Co., 110th St. and Central Park West, New York City.

Covell, Joseph H.—Mgr. Rental Dept. Parkway Garage Co., Central Park West and 110th St., New York City.

Coventry Chain Co., Ltd.—Coventry, England. Mfrs. chains.

Covert & Williamson.—Ovid, N. Y. Garage.

Covert, B. V.—Sec. and Treas. Covert Motor Vehicle Co., 57-61 Richmond Ave., Lockport, N. Y.

Covert, C. E.—Pres. Covert Motor Vehicle Co., 57-61 Richmond Ave., Lockport, N. Y.

Covert Mfg. Co.—Troy, N. Y. Mfrs. automobile screw jacks.

Covert Motor Vehicle Co.—57-61 Richmond Ave., Lockport, N. Y. Makers of the Covert commercial car (½ ton capacity), front and rear axles, and transmissions. Cap. \$100,000. Est. 1902. C. E. Covert, Pres.; B. V. Covert, Sec. and Treas.; Edward J. Fritton, Supt.

Covey & Wallace Motor Co.—16th and Alder Sts., Portland, Ore. Agts. Pierce, Cadillac, Locomobile, Knox, Peerless. Est. 1905.

Covey, York.—Staceyville, Ia. (Holsman.)

Cowan, W. K.—830-34 Broadway, Los Angeles, Cal. Rambler agent for Southern California. Est. 1892. Garage, 50 cars. Repairing.

Cowen, H.—Ft. Morgan, Colo. (Waltham.)

Cowey Engineering Co.—1 Albermarle

St., Picadilly, London, W. England. Mfrs. gauges.

Cowle & Pierson.—1413 Grand Ave., St. Louis, Mo. Garage.

Cowles & Co., C.—New Haven, Conn. Mfrs. annunciators, bow separators, watch holders, lamps, metal trimmings.

Cowles, W. B.—Vice-Pres. and Treas. Long Arm System Co., Lakeside Ave. and E. 38th St., Cleveland, O.

Cowls, D. H.—Glens Falls, N. Y. (Ford.)

Cox, E. A.—Vice-Pres. Miami Cycle & Mfg. Co., Middletown, O.

Cox, H. G.—Sec. and Vice-Pres. Hercules Electric Co., Indianapolis, Ind.

Cox, James F.—508 State St., New Haven, Conn. (Indian.)

Cox, J. W.—Kensington, O. (Jewel.)

Cox, J. Wade.—1013-15 Main St., Houston, Tex. (Ford.)

Crab-clutch.—See Clutch, Claw.

Crabette.—92 rue Richelieu, Paris, France. Mfrs. wearing apparel (coats).

Cradle.—A kind of trough formed of several curved cross braces secured to the side-members of the car-frame and supporting the radiator or the motor and its accessories.

Crafts, H. L.—233 E. 33rd St., New York City. Garage.

Craig, F. S.—521 Chestnut St., Long Beach, Cal. (Dolson.)

Craig, Frederick T.—Supt. Knox Motor Truck Co., Springfield, Mass.

Craig Garage Co.—1213 Madison Ave., Toledo, O. (Jewel, Stoddard-Dayton, Wayne.)

Craig, James.—556 W. 34th St., New York City. Mfr. marine gasoline engines, propellers and marine fittings. Treas. National Ass'n Engine and Boat Mfrs. Est. 1900.

Cramer, J. A.—737 Main St., Buffalo, N. Y. (Stoddard-Dayton, Wayne, Mitchell.)

Cramp & Sons Ship & Engine Bldg. Co.—Beach and Ball Sts., Philadelphia, Pa. Mfrs. crank cases, axles, gear cases, gearing, levers, lamp and tire brackets, slat iron, seat castings. Member M. & A. M. Cap. \$6,098,000. Inc. 1873. Henry S. Grove, Pres.; H. W. Hand, Vice-Pres. and Gen. Mgr.; Chas. Taylor, Sec. and Treas.; W. P. Smith, Supt. of Sales; B. H. Cramp, Supt. of Brass Foundry. Agts. Carroll S. Smith, 100 Broadway, New York City. Richards & Co., 200 Causeway St., Boston, Mass.

Cramp, James.—85 Summer St., E. Boston, Mass. Mfr. steel rims.

Crandall, Stone & Co.—Binghamton, N. Y. Mfrs. bow sockets, top fixtures.

Crane Auto & Garage Co.—Providence, R. I. (Atlas.) Garage.

Crane & Brewster.—243 Tabot Ave., Dorchester, Mass. Garage.

Crane & Co.—519 S. Canal St., Chicago, Ill. Mfrs. brass pipe fittings, wrought iron and steel pipe.

Crane & Co., G. F.—40 Clark St., Cleveland, O. Garage.

Crane & McMahon.—8 Bridge St., New York City. Mfrs. bent automobile wheel rims, (hickory and oak). hickory spokes and spoke billets. Partnership. Est. 1879. John Crane and W. A. MacMahon co-partners.

Crane & Whitman.—94-104 W. 7th St., Bayonne, N. J. Makers of a new car to be marketed during 1908 season, also machine work to order. Cap. \$50,000. Est. Oct., 1906. H. M. Crane, Pres.; Allen E. Whitman, Vice-Pres. and Treas.; P. M. Ericksen, Sec.; R. W. Wasson, Supt.

Crane Co., W. N.—1131-1133 Broadway, New York City. Mfrs. gas lamp burners.

Crane, C. C.—Foreman repair shop, Citizens' Motor Car Co., n. e. cor. 7th and Main Sts., Cincinnati, O.

Crane, E. F.—Holland Garage, 200 S. 3rd St., Easton, Pa. (York, Pullman.)

Crane, F. W.—Automobile Editor, The New York Times, Times Bldg., New York City.

Crane, J. E.—922-930 18th St., Denver, Colo. Dealers in second-hand cars. Est. May 5th, 1895. J. E. Crane, Mgr.; J. Wilson, Foreman. Garage, 15 cars. Repairing. Open day and night.

Crane, John.—Partner in firm Crane & MacMahon, 8 Bridge St., New York City.

Crane, Jonathan H.—Vice-Pres. Manhattan Brass Co., 332 E. 28th St., New York City.

Crane, W. Murray.—Director Pittsfield Spark Coil Co., Dalton, Mass.

Crane, Zenas.—Director Pittsfield Spark Coil Co., Dalton, Mass.

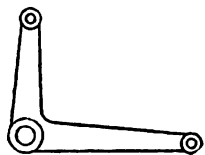
Crank.—A term, when used of boat, meaning ill-balanced, so as to be easily capsized.

Crank.—A lever keyed at right angles to a shaft or formed integral with it, and by means of which the shaft is turned or imparts motion.

A "two-throw" crank is two cranks forged or secured to a shaft at an angle of 90° with each other; a "three-throw" crank is three cranks placed at an angle of 120°; and in a "four-throw" the cranks are placed 180° apart from the two inner cranks, this being the latest and most approved practice.

Crank, Balance.—A form of crank which is provided with a balance weight opposite the crank itself, and which is designed to balance the weight of the crank-throw and the mass of the piston and connecting rod.

Crank, Bell.—A lever with two arms at right angles, and the fulcrum at the angle or apex. It is used for changing the direction of a pull or thrust.



Crank-case.—A case enclosing the crank-shaft of a motor and forming a protection for the mechanism and a support for the cylinders.

Crank-case Explosion.—See Back-firing.

Crank-chamber.—The space within the crank-case.

Crank, Disk.—A crank formed by a disk of metal keyed on the crank-shaft. The crank-pin is placed near its periphery. It is simpler to make and more easy to balance than an ordinary crank. In many gasoline motors the pair of fly wheels forms the disk-crank.

Crank-pin.—The cylindrical stud or pin of a crank, to which the connecting-rod is attached.

Crank-shaft.—Any shaft that bears one or several cranks, the number depending on that of the cylinders or the motor. Crank-shafts, which were formerly laboriously forged by hand, or cut out of



a solid block of steel, are now, where made in large numbers, drop-forged from special steel, and afterward turned down to size. After they are within a few thousandths of an inch of the requisite diameter, they are carefully ground to fit the bearings for which they are intended. The crank-shaft shown in the figure is for a four-cylinder motor and of the three-bearing type. See Crank.

Crank, Starting.—A handle placed in front of the car and operating, through gear-wheels or chain-drive, on the crank-shaft in such a way as to start the motor.

Cranking.—Turning the starting handle of a motor car in order to effect the starting.

Cranska Thread Co., The.—Worcester, Mass. Mfrs. top and upholstering thread.

Cranston & Co., T. H.—58 Wabash Ave., Chicago, Ill. Garage.

Crary, W. P.—Pres. and Treas. 20th Century Mfg. Co., 19 Warren St., New York City.

Craven Garage.—Kellogg, Ia. Garage.

Crawford & Soper.—1010 Prospect Ave., Cleveland, O. Garage.

Crawford Agency.—152 W. 56th St., New York City. (Crawford.)

Crawford Auto Agency.—Bucyrus, O. (Winton.)

Crawford Auto Co.—Hagerstown, Md. Mfrs. automobiles, gas. (Crawford cars.)

Crawford, G. W. & H. D.—Delhi, N. Y. Mfrs. wood and metallic bodies.

Crawford, William Wilberforce.—B. in Washington, Conn. Educated at Beloit and Oberlin Colleges, University of Wisconsin. Occupation, Ass't Sec. Chicago Automobile Club. Formerly Automobile Editor Chicago Record-Herald, previously in general newspaper work in El Paso, Tex. At present free lance writer for a number of magazines and newspapers. Res. 5456 Greenwood Ave. Address 13-17 Plymouth Pl., Chicago, Ill.

Cray Bros.—1244 9th St., W., Cleveland, O. Mfrs. automobile tops, cushions, trimmings.

Cray, W. A.—Sec. H. E. Wilcox Motor Car Co., 1030 N. E. Marshall St., Minneapolis, Minn.

Creamer, Theodore B.—B. April 10, 1876, at Stevens, N. J. Education, Grammar School, Camden, N. J. Occupation, Automobile Editor Philadelphia Inquirer, Philadelphia, Pa.

Creasy, R. B.—Ballinger, Tex. (Ford.)

Creeping.—The tendency of a tire to rotate relatively to the rim. Creeping not only loosens the tire, but tends also to produce leakage through the strain set up at the valve. (2) A phenomenon of capillarity which often proves annoying in battery jars, and which consists in the tendency of certain solutions of salts to ascend the sides of the jar and leave thereon a solid deposit.

Cremona Motor Mfg. Co.—Lotts Rd., Chelsea, London, S. W. England. Mfrs. automobiles, steam. (Cremonie cars), automobile motors.

Crépet, V.—la Demi-Lune, Rhone, France. Mfrs. elastic wheels.

Crescent Auto & Machine Co.—Cor. E. 2nd and Marr Sts., Fond du Lac, Wis. Agts. Cadillac, Buick, Pope-Hartford, White. Est. 1906. Cap. \$10,000. F. S. Wiley, Pres.; W. H. Hathaway, Sec. and Mgr.; H. R. Potter, Treas.; H. S. Smith, Supt. Garage, 25 to 30 cars. Repairing.

Crescent Auto & Supply Co.—2254 Missouri Ave., St. Louis, Mo. Supplies.

Crescent Automobile Co.—2565 Boulevard, Jersey City, N. J. Agts. Cadillac, Pope-Hartford, Pope-Toledo. Est. 1900. Cap. \$50,000. G. E. Blakeslee, Pres. and Gen. Mgr.; L. J. Blakeslee, Treas.; E. E. Downs, Sec. Garage, 130 cars. Repairing.

Crescent Auto Top Co.—58 W. 43rd St., New York City. Mfrs. automobile tops, slip covers, dust hoods, extra seats,

glass fronts. Est. April, 1906. James C. Stoops, Mgr.; Marie E. Stoops, Sole Owner.

Crescent City Auto Co.—217 S. Rampart Ave., New Orleans, La. (Cleveland, Thomas Flyer, Northern, Dragon.)

Crescent Forgings Co.—Oakmont, Pa. Mfrs. drop forgings.

Crescent Garage.—McAllister and Gough Sts., San Francisco, Cal. (Moline.)

Crescent Parts Co., The.—1743 Broadway, New York City. Mfrs. removable rims. Cap. \$150,000. Est. Feb., 1907. C. F. Wyckoff, Pres.; S. S. Slater, Vice-Pres.; Oscar Warner, Sec. and Treas.

Crescent Phosphorized Metal Co.—2314-2318 Wood St., Philadelphia, Pa. Mfrs. brass and copper metals.

Crespo, Herman.—27 Arenal, Madrid, Spain. Mfrs. motorcycles.

Crétin-Billet Frères.—Morez-du-Jura, France. Mfrs. goggles.

Crim, Samuel M.—Pres. Reliance Automobile Co., 547-57 Fulton St., San Francisco, Cal.

Crispin Sheet Steel Metal Mfg. Co.—3038-3046 Chestnut St., Philadelphia, Pa. Mfrs. pressed steel products, stampings.

Crist, A. H.—Owner and Mgr. Crist, Scott & Parshall, Cooperstown, N. Y.

Crist, Scott & Parshall.—Coopers-town, N. Y. Est. 1906. A. H. Crist, Owner and Mgr. Garage, 20 cars. Repairing.

Critchley Machine Screw Co.—25 Union St., Worcester, Mass. Mfrs. ball bearings, screws.

Criterion Motor Co.—Des Moines, Ia. Mfrs. automobiles, gas. Inc. \$100,000.

Crittendon, Geo. A.—Lynn, Mass. (Baker, Panhard, Darracq.)

Crocker, C. M.—Sec. Automobile Road Map Co., 428 Lafayette St., New York City.

Crocker Cycle Co.—Falmouth, Mass. (Cadillac.)

Crocker House Garage.—Golden St., New London, Conn. Garage.

Crockett, D. E.—Director Dragon Motor Co., 31st, 32d and Chestnut Sts., Philadelphia, Pa.

Crocus.—A polishing powder consisting of peroxide of iron; used for polishing steel and brass.

Croff, A. C.—Main St., Sellersville, Pa. (Rambler.) Est. 1904. Garage, 6 cars. Repairing.

Croft, W. H.—Peekskill, N. Y. (Maxwell.)

Crofton Storage Battery Co., The.—423-425 W. Queen St., Toronto, Can. Mfrs., dealers and agents sparking batteries, storage batteries, sparking and lighting systems. Est. 1898. J. Wilfred Madigan, L. Brady, Benj. Pinkas, officers; John Carey, Head Automobile Dept. Garage.

Cronin Automobile Co.—569 S. Clinton St., Syracuse, N. Y. (Premier, Reo, Dragon.)

Croninger, R. Harry.—Mgr., Second Vice-Pres. Pennsylvania Auto Motor Co., Bryn Mawr, Pa. Mem. Merion Cricket, Haverford, Pa. Res. Bryn Mawr, Pa. In trade since 1899. Used first automobile January, 1899.

Cronk, E. B. & A. F.—7 Liberty St., Utica, N. Y. Garage.

Crook, Frank.—386 High St., Central Falls, R. I. Garage.

Crosby & Co., S. L.—186 Exchange St., Bangor, Me. Agts. Reo, Knox, Est. 1898. Cap. \$10,000. H. A. Chapman, Pres.; E. B. Sanger, Treas.; E. H. Dakin, Sec.; C. F. Burrill, Head of Auto Dept. Repairing.

Cros, J. et A. Laboureaux.—12 rue des Poissonniers, Neuilly-sur-Seine, France. Mfrs. spark plugs.

Crosby Co.—Buffalo, N. Y. Mfrs. ball retainers, brake drums, ball cups, auto gear cases, hub caps, hub flanges, lamp brackets, pressed steel products, shells, boiler steel.

Crosby Frisian Fur Co.—116 Mill St., Rochester, N. Y. Mfrs. automobile robes, gloves and gauntlets.

Crosby Steam Gate & Valve Co.—97 Oliver St., Boston, Mass. Mfrs. pressure gauges, safety valves.

Croselmire & Ackor Co.—42 Walnut St., Newark, N. J. Mfrs. platinum and iridium wire, rivets, etc., for sparking points. Cap. \$100,000. Est. 1901.

Cross.—The bolts, arranged at right angles, upon which the forks of a universal joint pivot.

Cross.—A connecting piece for four pipes which meet at right angles.

Cross-head.—A block sliding between guide-bars, and designed to give the piston-rod of a steam engine motion in a straight line axial with the cylinder.

Crossed Belt.—See Belt, Crossed.

Cross Engine Co., M. O.—800-806 Bellevue Ave., Detroit, Mich. Mfrs. carbureters, clutches, reverse marine gears, transmission gears, gasoline auto-motors, gasoline marine motors.

Cross-head Pin.—See Wrist-pin.

Cross-link.—Same as drag-link. See Link, Drag.

Cross-section.—A cut across any object at right angles to its length. (2) A drawing of such a section.

Cross-shaft.—The same as counter-shaft. See Shaft, Counter.

Crossett Mercantile Co.—Crossett, Ark. (Northern.)

Crossman, Willard.—Vice-Pres. The Auto Garage Co., Inc., 146-148 W. 39th St., New York City.

Cross, W. H.—18 Franklin St., Brooklyn, N. Y. Mfrs. metal polish, hand cleaners. Est. 1892.

Crouch, Chas. P. & Co.—484 Carroll Ave., Chicago, Ill. Mfrs. gasoline automobile and marine motors.

Crouch Motor Co.—Stoneham, Mass. Mfrs. motorcycles.

Crouse Hinds Co.—W. Jefferson St., Syracuse, N. Y. Mfrs. timers, distributors.

Crowe-Graham Motor Car Co.—Portland, Ore. (Knox.)

Crowe Metal Mfg. Co.—71 W. Jackson Blvd., Chicago, Ill. Mfrs. name plates.

Crowell, Gilmer.—292-296 Graham St., Brooklyn, N. Y. Mfrs. air compressors.

Crowley, G. G.—1319 E. Market St., Akron, O. Repairing.

Crown Battery Co.—992 Southern Blvd., New York City. Mfrs. primary batteries.

Crown Garage.—534 Washington St., Hudson, N. Y. (Franklin.) Garage.

Crown Motor Car Co.—23 Motor Mart, Boston. (Glide, Aurora.)

Crown-plate.—The upper and lower sheet of a steam-car boiler.

Crown-sheet.—The lower head of a steam boiler over the burner.

Crowthers, Robert C.—117 E. 7th St., Cincinnati, O. (Elmore, Marion.)

Croxton, H. A.—Pres. and Treas. Forest City Motor Car Co., 101-149 Walnut St., Massillon, O.

Crozier, Cary.—West Side, Muncie, Ind. Repairing.

Crucible Steel.—See Steel, Crucible.

Crucible Steel Castings Co.—Landsdown, Pa. Mfrs. steel castings.

Crucible Steel Castings Co.—Milwaukee, Wis. Mfrs. steel castings.

Crucible Steel Co. of America.—Empire Bldg., Pittsburg, Pa. Mfrs. bar iron and steel.

Cruikshank, C. Gordon.—Pres. Consolidated Bicycle & Motor Co., 185 Notre Dame E., Winnipeg, Can.

Cruikshank, C. L.—Vice-Pres. Consolidated Bicycle & Motor Co., 185 Notre Dame E., Winnipeg, Canada.

Cruiser.—A term applied to touring boats in contradistinction to racing boats, called "racers."

Crum & Co., H. C.—958-960 N. High St., Columbus, O. (Rambler, Jackson.)

Cryder & Co.—583-585 Park Ave., New York City. Importer Mors, Renault, Leon Bollée. Est. 1906. T. A. Havemeyer, Pres.; H. C. Cryder, Treas.; A. Harris, Garage Dept.; C. Morel, Head Repair Dept. Garage. 65 cars. Repairing.

Cryder, Henry C.—Treas. Cryder & Co., 583 Park Ave., New York City.

Cryolite.—A fluoride of aluminum and sodium. $3\text{NaF} \cdot \text{Al}_2\text{F}_3$. It is a white lamellated mineral with a perfect cleav-

age, small fragments of which easily fuse. It is one of the sources of aluminum.

Crypto-gear.—See Gear, Epicyclic.

Cubbertson Bros.—Sacramento St., Lodi, Cal. (Waltham.)

Cuddleback, E. R.—122-124-126 E. 4th St., Fremont, Neb. (Stoddard-Dayton, Reo, Ford, Mason, Premier.) Est. April 1, 1906. Garage, 30 cars. Repairing.

Cuddeback, F. L.—Pueblo, Colo. (Waltham.)

Cudell und Cie.—Reinikensdorferstrasse 65, Berlin, Germany. Mfrs. automobiles, gas comm., (Cudell trucks), automobile motors, motorcycles, motorcycle motors.

Cuenod, Ernest.—3 Rue Lafitte, Paris. Born in Switzerland. May 3, 1858. Commander of Isabelle-la-Catholique, Christ Militaire of Portugal. Counsel of various automobile societies; administrator of the League against Road Dust; member of the extra-parliamentary commission for automobile traffic; founder of the Compagnie Française des Bascules Automatiques of the Compagnie Parisienne des Voitures Electriques, of the Georges Richard Brasier establishments, of the Martin Automobile Company (Ltd.) at Saint Blaise, Switzerland, etc.

Cugnot.—A celebrated mechanic. Born in France in 1725 and died in 1804. In 1770 he invented the first steam carriage that ran upon a common road. This carriage, which had three wheels, is preserved at the Conservatoire des Arts et Métiers at Paris.

Cullman Wheel Co.—1030 Dunning St., Chicago, Ill. Mfrs. chains, differential gears, sprockets.

Culp Bros.—307 Forest Ave., Pacific Grove, Cal. Est. 1895. Garage. 20 cars. Repairing.

Culp, T. S.—625-631 Mahoning St., Canton, Stark County, O. Agts. Gale, Wayne. Dealer in second-hand cars. Est. March 15, 1887. T. S. Culp, Proprietor. Garage, 50 cars. Repairing.

Culver Novelty Co.—Culver, Ind. Mfrs. carbureters.

Cumbe, E. R.—1541 Cleveland Pl., Denver, Colo. (Rambler, Mitchell.)

Cumberland Steel Co.—William St. and B. & O. R. R. Cumberland, Md. Mfrs. steel shafting, flange couplings, safety set collars.

Cumberland Valley Automobile Ass'n.—Mechanicsburg, Cumberland County, Pa.

Cunningham, J. C.—Le Grand, Cal. (White.)

Cuntz, Hermann Francis.—B. July 21, 1872, in Hoboken, N. J. Educated at Stevens Inst. of Technology, degree of M. E. in 1893, Mechanical and other Engineering courses. Occupation, Mechanical Engineer, Patent Attorney and Expert. Retained principally with auto-

mobile interests. Member: The Engineers Club, Automobile Club of America, Aero Club of America, Transportation Club of N. Y., City Club of N. Y., Naval and Military Order of Spanish - American War, Connecticut Commandery, Hartford Club, Hartford Canoe, Golf, University Clubs. Connected with trade since 1895. First operated automobile in 1896. Residence, 65 Forest St., Hartford, Conn. Address, 5-7 E. 42nd st., New York City.



Cup, Priming.—A small cup designed to admit a small quantity of gasoline into the cylinder in cold weather. It is usually combined with a small relief cock which, if opened when the engine is started, relieves the compression and greatly facilitates the motor's operation.

Curé, Raoul E. Gasse et Cie.—Darneval, pres. Rouen, Nièvre, France. Mfrs. non-skids.

Curren, James.—Officer Delta Mfg Co., Bloomfield, N. J.

Current.—When a wire connects two conductors at different potentials, it becomes the seat of a flow of electricity going from a body at the highest potential (or positive) to that of the lowest potential (or negative). Such flow of electricity constitutes the current. The initial cause of an electric current is therefore a difference of potential between two points, and such difference of potential is produced by an electromotive force. If the points are united by a conductor, there will be a current, and the value of the latter will be proportionate to the difference of resistance thereof. The difference of potentials is measured in "volts," the intensity in "amperes," and the resistance in "ohms." As the passage of the current into a conductor produces an elevation of temperature of the latter, there will be an absorption of a certain energy which is measured in "watt-hours," the unit of power being the "watt."

Current, Alternating.—A current of electricity that changes or reverses direction rapidly instead of flowing steadily in one direction, as a direct or continuous current is supposed to. This type of current is of no use in charging ignition coils, but a rotary transformer or motor generator may be used for this purpose, taking an alternate current to drive the

motor and giving a continuous current from the generator.

The chief disadvantage attending the use of alternating currents is that they are less suited for the driving of electric motors than continuous ones; and when power has to be transmitted by their means, some special form of motor has to be used, and these forms can scarcely be said to have reached the same state of efficiency that has been obtained by the continuous current motor.

Two or more alternating currents differing from each other in "phase" by a constant amount are called "polyphased currents." "Synchronous currents" are alternating currents of the same period and agreeing in phase. Two alternating currents are "asynchronous" when they have not the same period.

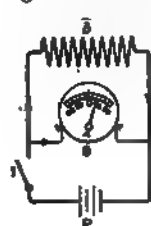
Current, Continuous or Direct.—A current of constant direction and intensity. It is the simplest form of flow of electricity in conductors, and the one used in ordinary ignition circuits.

Current-density.—The amount of current per unit of area of cross-section of a conductor.

Current, Eddy.—A current produced entirely within a mass of metal through the movement or alteration in number of the magnetic lines of force passing through it. Eddy currents tend to occur in the cores of transformers, pole pieces of the field magnets and dynamos, etc.

Current, Establishment.—In the production of induced currents by means of a continuous inducing current, as in the case of ignition coils, it is expedient to set up the inducing or primary current at the exact instant at which the induced current should give a spark at the plug. This is accomplished by means of a mechanical interrupter controlled by the motor, or by a magnetic interrupter (trembler) operating in parallel with a distributor also controlled by the motor. In the case of a high-tension magneto the primary current is established by a distributor keyed to its shaft and working synchronously with the motor.

Current, Extra.—An induced current which develops in a circuit traversed by a variable current. Let a be a circuit (see figure) comprising a coil, b, designed to increase the self-induction, and



traversed by a current from a battery, P. If, by means of an interrupter, I, a current is set up, there will be produced in the coil, b, a reverse induced or "extra-current," which may be detected by a galvanometer, G. The needle, previously placed in its position of equilibrium, will be moved beyond such posi-

tion, thus indicating the superposition in the galvanometer of the current coming from the battery, and of that of opposite direction, coming from the coil. Upon opening the circuit there will be produced an extra-current that will be shown by a reverse impulsions of the galvanometer needle previously placed back of zero. It is the extra-current of the induced current that gives the make-and-break spark in ignition by an ordinary magnet.

Current, Inducing, and Induced.—A conductor movable in a fixed magnetic field, or fixed in a variable field, is the seat of an induction current. The magnetic field plays the part of inductor. A magnetic field may be created by a coil traversed by what is called an "inducing current." The current developed by induction in a circuit placed in the magnetic field of the inducing coil is called an "induced current." The industrial machines called alternators, dynamos, transformers, etc., are all based upon the phenomena of induction. The ignition coils employed on automobiles are "transformers" consisting of an inducing and induced coil.

Current-intensity.—The intensity of an electric current corresponds to the notion of grandeur and intensity of effect. In order to decompose water, for example, there must be a determinate voltage, and as long as such voltage is not attained, the decomposition will not take place. But after the necessary voltage is attained, the quantity of water decomposed will depend on the intensity. The greater the intensity, the greater will be the volume of water decomposed.

Currier-Cameron Co.—85 Elm St., Amesbury, Mass. Mfrs. wood and metallic bodies.

Currier, Gardner & Bullis.—Coudersport, Pa. Mfrs. differential gears.

Curry, Duncan.—Automobile reporter and editor, American. B. in New York, Nov. 12, 1864. Ed. at private and public schools. Res. Bayside, L. I. Office, 238 William St., New York City.



Curry Oil & Supply Co.—Boston, Mass. Mfrs. oil.

Curtain Supply Co.—85-93 Ohio St., Chicago, Ill. Mfrs. automobile tops and curtains. Cap. \$300,000. Est. 1899. E. T. Burrows, Pres.; W. W. Willets, Vice-Pres. and Treas.; W. H. Forsyth, Sec. and Gen. Mgr.

Curt & Adams.—420 Spruce St., Scranton, Pa. (Maxwell.)

Curtin-Herbert Co.—Gloversville, N. Y. (Northern.)

Curtin, Williams Auto Co.—122 Parsons Ave., Columbus, O. (Peerless, Pope-Toledo, Pope-Hartford, Autocar, Stevens-Duryea.)

Curtis Automobile Co.—Grand Ave., Milwaukee, Wis. (Ford.)

Curtis, Harry B.—Sec. and Treas. Bridgeport Hardware Mfg. Co., 461-469 Iraniston Ave., Bridgeport, Conn.

Curtis-Hawkins Motor Co.—Motor Mart, Boston, Mass. (Grout, Chadwick.)

Curtiss Auto Co.—70 Albany Ave., Brooklyn, N. Y. (Franklin, second-hand cars.)

Curtiss Mfg. Co., G. H.—Hammondsport, N. Y. Mfrs. motorcycles, motors (aeronautic and automobile). Agts. Frayer-Miller, Ford.

Curtner, A. D.—Sec. Osen Hunter Automobile Co., 407 Golden Gate Ave., San Francisco, Cal.

Cushing's Auto & Cycle Repository.—San Jose, Cal. (Model.)

Cushion, Pneumatic.—A cushion inflated with air instead of being stuffed with hair or being rendered elastic by springs.

Cushion-tire.—See Tire, Cushion.

Cushioning.—The gradual checking of the motion of the piston of an engine by the admission of steam or by the closing of the exhaust-port just before the end of the stroke.

Cushman, A. T.—Caribou, Me. (Jewel.)

Cushman, E. B.—Vice-Pres. Cushman Motor Co., 2020 N St. Lincoln, Neb.

Cushman, L. S.—Pres. Cushman Motor Co., 2020 N St., Lincoln, Neb.

Cushman Motor Co.—2020 N St., Lincoln, Neb. Mfrs. gasoline motors for motorboats, automobiles and stationary work. Propellers, carbureters and power fruit sprayers. Cap. \$50,000. Est. 1903. L. S. Cushman, Pres.; E. B. Cushman, Vice-Pres.; A. O. Taylor, Mgr. Agents: Denver Gas Engine & Appliance Co., Denver, Colo.; Seattle Hardware Co., Seattle, Wash.; W. W. Stephens, 6 Reade St., New York City.

Cutler, Elihu Herbert.—B. March 6, 1856, at Ashland, Mass. Education, High School. Director Knox Automobile Co., Springfield, Mass. Member Engineers' Club of New York. Residence, 84 Westminster St., Springfield, Mass. Address, care of Knox Automobile Co. Connected with automobile trade since 1900. Owned first car



1901. Recreations, automobiling, golf. Office, 7 E. 42d St., New York City.

Cutler, Austin.—La Porte, Ind. (Haynes.)

Cutler, S. C.—Vice-Pres. and Head of Machinery Dept., Republic Belting & Supply Co., 1616 W. 3rd St., Cleveland, O.

Cut-off.—The point at which the admission of steam to a cylinder is stopped. It usually varies from a quarter to three-quarters of the stroke, and is determined by the lap in case of the ordinary slide-valve.

Cut-off Plug.—A plug with which an electric switch is provided, and which can be used against tampering. Withdrawing the plug from the switch disconnects the batteries and renders it impossible for meddlers to start the motor. Called also a contact-plug.

Cut-out.—A device inserted in an electrical circuit in order to break it in the event of an excess of current passing through it. More commonly a fusible cut-out is used, but mechanical and automatic cut-outs of many kinds are employed.

Cut-out, Muffler.—A device whereby the gases may be exhausted directly into the air without passing through the muffler.

Cuyler, Lee.—453 Golden Gate Ave., San Francisco, Cal. (Packard, Cadillac.)

C. V. I. Motor Co.—Jackson, Mich. Mfrs. automobiles, gas.

Cycle.—A regular succession of transformations which a body undergoes when placed in known conditions. For example, a volume of gas formed in a carburetter always undergoes the following "cycle": it is drawn in, then compressed, then expanded, and then expelled, and so on. It undergoes a cycle of four phases. See Motors.

Cycle, Atkinson.—A modification of the four cycle and having as its essential feature periodic variations in the stroke of the motor-piston.

Cycle, Brayton.—A cycle of which the principle is the compression of a mixture of inflammable gas and air which is introduced into the working cylinder and there ignited, so as to burn in such a manner that the pressure shall not increase above a fixed constant value. The power is generated by the increase of volume at constant pressure due to the inflammation of the gas in the air.

Cycle, Carnot's Ideal.—The series of operations that would occur in a thermic motor theoretically perfect: (1) Adiabatic compression; (2) isothermal expansion; (3) adiabatic expansion; (4) isothermal compression. The Carnot cycle does not necessarily apply to the internal-combustion motor for the reason that the gas-motor does not operate necessarily under the conditions of such cycle.

Cycle, Diesel.—A cycle of four phases, which occur as follows: Air is inspired on the suction-stroke and then compressed to the temperature of incandescence on the compression-stroke, while during the explosion-stroke liquid fuel is atomized directly into the heated air within the cylinder.

Cycle, Magnetic.—A complete series of changes in the magnetic condition of a body, such that at the end of the series the body has returned to its original magnetic state.

Cycle, Motor.—See Motor-cycle.

Cycle, Otto.—Called also the Beau de Rochas cycle. The same as the four-phase cycle, or "four cycle," a term applied to a type of internal-combustion motors in which the four operations of suction, compression, heat-expansion and exhaust occur in as many distinct, successive strokes. See Motors.

Cycle, Steam-engine.—In the steam-engine the heat is added to the liquid, and its temperature sufficiently raised so that, under the conditions of pressure which are fixed upon, the liquid becomes a gas. In the second stage this gas is allowed to expand to as low a pressure as possible or convenient, and, by such expansion in the engine, do work upon the piston. The gas is then discharged either as a gas or as a liquid. This cycle is incapable of modification except in minor details.

Cycle et Automobile Industriels.—Published at 9 rue Buffault, Paris, France.

Cycle & Automobile Trade Journal.—1213 Filbert St., Philadelphia, Pa. Pub. monthly. James Artman, Pres.; Geo. H. Buzby, Vice-Pres.; C. A. Musselman, Sec. and Treas.

Cycle & Motorcycle Trader, Illustrated.—Published at 19 William St., London, England.

Cycle & Motor Trades Review.—Published at 20 Tudor St., London, England.

Cyclometer.—A small instrument for recording the distance made by a vehicle, by registering the number of revolutions of the wheels.

Cyclos Zarbref.—3 Calle de las Carrateras, Barbastro, Spain. Mfrs. motorcycles. (Zarbref.)

Cylinder-bore.—See Bore, Cylinder.

Cylinder-capacity.—The volume of a motor-cylinder, or, more accurately, the volume created by the maximum change of place of the piston.

In motors of a same type, such as those now employed on gasoline cars, a knowledge of the cylinder-capacity permits of roughly estimating the power of the motor; hence the origin of the "classification by cylinder-capacity" and of the "maximum cylinder-capacity." It may

be remarked that such methods of classification, with a view to a race, possess the inconvenience of favoring excessive speeds through the adoption of wide bores and short strokes. In the powerful motors of racing cars such a result is brought about through other reasons, upon which it is impossible to dwell in this place, and the principal ones of which have, as consequences, a lightness of the motor and of the gear-case. The cylinder-capacity of motors varies from 15.25 to 20.35 cubic inches (motor-cycles) to 915.5 to 976.5 cubic inches (racing cars).

If it be reflected that the ignition of a mixture, its combustion, and its expansion must take place within the extremely short time during which the power-stroke of the piston lasts, the importance that a powerful and precise ignition may have, especially in automobile motors in which the duration of such power-stroke is generally less than 5-100th of a second, can be readily understood.

To ignite an "explosive" mixture at a certain point is to bring about the self ignition of the mixture around such point, and as that ignition is both a direct function of the temperature and pressure, it can be as well obtained by a slight heating of the strongly compressed mixture as by a high temperature of the ignition point when the mixture is slightly compressed. As experience, however, shows that the propagating of the explosive wave around the point of inflammation is so much the more rapid and the combustion of the fuel so much more complete in proportion as the pressure of the mixture is greater, these two reasons militate again in favor of high compressions.

The advantages of electric ignition, which is now generally adopted in automobile motors, are of two orders, viz.: in the first place, the property that the spark possesses to the highest degree of simultaneously producing an extremely elevated compression and heating of the part of the mixture that surrounds it; and, in the second, the great facility presented by this mode of ignition of permitting of variations, at pleasure and instantaneously, of the precise moment of the ignition of the mixture before, during and after the passage of the piston to the dead-point.

Experience shows that the effective power, that is to say, the power utilisable upon the shaft of a given motor, does not increase indefinitely with its angular speed, but that such power passes, on the contrary, through a maximum. This leads to the supposition that the work of the cylinder volume must constantly diminishes in measure as the velocity increases.

As the quantity of the mixture admitted diminishes on the one hand, while the negative work of escapement of the burned gases increases on the other, these two causes concur in the reduction of the work of the cylinder volume in measure as the velocity increases.

The internal combustion motor presents the peculiarity of developing the same power at two different velocities, one less and the other greater than a certain critical velocity corresponding to its maximum power. Such maximum, moreover, is regulated by the structural peculiarities of the motor and particularly by the lift that can be given the suction and exhaust valves.

The characteristics of motors of recent construction is the substitution of a mechanically operated automatic valve, that is to say, a valve operating through the suction of the motor. The mechanical control of the suction valve permits of giving it very large dimensions and very high lifts and of thus obtaining much greater maximum powers. The automaticity of the suction valve, moreover, presents the serious drawback of preventing its intermediate opening as soon as the motor begins its suction, and of retarding its closing after the passing of the piston to the end of its suction-stroke, in giving the latter time to force into the atmosphere, through the carburetter, a fraction of the mixture aspired, which is so much greater in proportion as the motor revolves with greater velocity; whence the excess of carburetion, and, consequently, waste of fuel found at high speeds with the use of this kind of valves.

Cylinder Cooling.—The cooling of the walls of a gas-motor cylinder is rendered imperative for the reason that the heat produced when the mixture of gas and air is fired is fully as intense as that of a furnace, say 2,730° F. (1,500° C.). Were

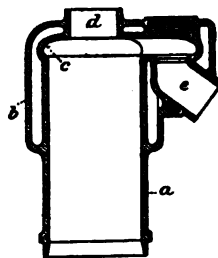


Fig. 1.

not some means provided to reduce the temperature of the cylinder walls and combustion chamber to a reasonable degree they would quickly become heated to such a point as to cause the lubricating oil to burn and form a carbonaceous deposit, the compression would be lost, and, as a result of all this, the motor would refuse to operate. The process of keeping the heat of the walls of the cylinder down to a proper limit is termed "cooling the cylinder." The usual method of effecting such cooling is by causing

water to circulate through a jacket, b (see figure), surrounding the combustion space, and which is cast integral with the cylinder or is formed of sheet metal, such as aluminum or copper.

The circulation of the water designed to reduce the temperature of the cylinder walls of the motor is effected in either one or two ways: (1) By means of a small rotary pump, which forces the water through the jackets and then to a radiator so situated as to be exposed to the currents of air set up during the forward running of the car, or further cooled by a fan driven by the motor; or (2) by a thermosiphon. See Thermosiphon and Fan.

While the cooling of a gas-motor is most successfully accomplished by means of a circulation of water, many cars employ an air-cooling system, in which a number of flanges or radiating ribs or fins cast integral with the cylinder and having a large radiating surface is used (Fig. 2). Another method (Knox) consists in the use of corrugated steel pins, two inches in length, screwed into the surface of the cylinder,

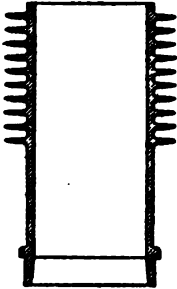


Fig. 2. screwed into the surface of the cylinder,

in order to radiate the heat. Another method (Regas) consists in the use of slotted tubes on the cylinder. Still another system consists in surrounding the combustion-chamber with a jacket open at the bottom, and into which the air is blown from the top by a powerful blower.

Cylinder-head.—The same as Combustion-head or Combustion-chamber. q. v.

Cylinder-jacket.—See Jacket, Water.

Cylinder, Motor.—The part of a motor in which moves the piston, driven by the powerful expansion of the heat, or the pressure of the steam, according as the motor is an internal combustion or a steam one.

The combustion-head or chamber and cylinder of an internal combustion motor (which are usually of special gray iron) are sometimes cast separately, the two being then bolted together and the joint made tight by asbestos packing.

The difficulty, however, of keeping this tight and the possibility of the blowing out of the gasket, necessitating a somewhat lengthy repair, has brought the single-piece casting into general use.

Cylinder-oil.—A heavy lubricating oil for motor-cylinders which, at the temperature of the cylinder walls, becomes so fluid as to flow freely.

D

d. h. p.—Abbreviation of "delivered horse-power."

D. K. Electric Co.—106-110 Locust St., St. Louis, Mo. Mfrs. high and low tension magnetos. Not incorporated. Est. January, 1906. J. H. Duncan, Mgr.

Da-an-ite Auto Supply Co.—1912 Broadway, New York City. Supply house.

Dack, Fred E.—Galva, Ill. (Compound.)

Daclyn, H.—Place de l'Abondance, Lyons, France. Mfr. speed and grade indicators.

Dahl & Sons.—Aurora, Neb. (Reo.)

Daimler, Gottlieb.—A name celebrated in the automobile industry. Herr Daimler must be considered as one of the

great founders of automobilism, because of the very remarkable improvements that he introduced into internal combustion motors in applying them especially to mechanical locomotion. His first motor (single-cylinder vertical) was shown at the



Exposition Universelle of 1889 upon a street car. The patent was purchased by M. Peugeot, who afterward ceded it to M. Levassor, of the firm of Panhard & Levassor. Herr Daimler was born March 17, 1834, at Sohrndorf (Wurtemberg), and died March 6, 1900, at Cannstatt.

Daimler Mfg. Co.—1777 Broadway, New York City. (American Mercedes.)

Daimler Mfg. Co.—939 Steinway Ave., Long Island City, N. Y. Makers of the American Mercedes car, first marketed 1901. Seven models made since. Clifford M. Briggy, Pres.; Otto G. Nestle, Sec.; Alfred Kessler, Treas.

Daimler Motor Co., Ltd. (1904), The.—Daimler Works, Coventry, England. Mfrs. gasoline and commercial automobiles (Daimler).

Daimler Motoren Gesellschaft.—Utertukheim, Germany. Mfrs. marine motors, gasoline commercial automobiles (Daimler), gasoline automobiles (Mercedes and Maja).

Dain, F. W.—Peekskill, N. Y. (Waltham.)

Dakin, E. H.—Sec. S. L. Crosby & Co., 186 Exchange St., Bangor, Me.

Dale, Chas. J.—Plattsburg, N. Y. (Northern.)

Dale, John G.—Sec. Auto Import Co., 1786 Broadway, New York City.

Dalifol et Cie.—40 blvd. d'Asnières, Ile de la Jatte, Neuilly, France. Mfrs. carbureters, automobile and motorcycle motors.

Dallas, A. C.—36 La Salle St., Chicago, Ill. Mfrs. brass and copper tubing.

Dallas Automobile Club.—Eugene Corley, Sec., 315 Commerce St., Dallas, Tex.

Dalley & Barrows.—128 N. Broad St., Philadelphia, Pa. (Fiat.)

Dalley & Schill.—230 N. 22nd St., Philadelphia, Pa. (American.)

Dalsace, G.—23 rue Ruhmkorff, Paris, France. Mfr. oil lamps.

Dalsimer Auto Co.—1206 Market St., Philadelphia, Pa. (Haynes.)

Dalton Ingersoll Co.—Boston, Mass. Mfrs. brass pipe fittings.

Dalzel Axle Co.—S. Egremont, Mass. Mfrs. axles.

Damper.—A copper frame on which the wire in a galvanometer is sometimes coiled, and which "dampens" the oscillations of the needle. (2) A term sometimes applied to a device designed to counteract the recoil of a spring. See Shock-absorber.

Damping.—The checking of motion, particularly of vibratory motion, by the friction of the medium in which the moving body is placed, or by other retarding forces. (2) Preventing the indicator of an instrument from oscillating by virtue of its own inertia.

Dana, Howard.—Cobbleskill, N. Y. (Dolson.)

Danbury Hardware Co., The.—249-251 Main St., Danbury, Conn. (Rambler); supplies. Est. 1896. Cap. \$20,000. A. R. Jones, Pres.; J. R. Hill, Sec., Treas. and Buyer automobile goods.

Danielson & Co., J. S.—Jamestown, N. Y. Mfrs. tools.

Danielson, C. B.—Milwaukee, Wis. (Monarch.)

Danielson, O. M.—Leland, Ill. (Auburn.)

Dann Bros. & Co., The.—84 Franklin St., New Haven, Conn. Mfrs. bent wood bodies; seats (wood); dashes and fenders (wood); laminated wood roof panels; general woodwork to specification. Cap. \$40,000. Est. 1858. Clarence B. Dann, Pres.; Winfield P. Dann, Sec. and Treas.

Dann, Clarence B.—Pres. The Dann Bros. & Co., 84 Franklin St., New Haven, Conn.

Dann, Winfield P.—Sec. and Treas. Dann Bros. & Co., The, 84 Franklin St., New Haven, Conn.

Dann's Auto Station, J. T.—314 Main St., Danbury, Conn. Supplies; garage; repairs.

Dante, Cusi. — Michocan, Mex. (Wayne.)

Darbilly et Cie., H.—12 rue Vincent, Paris, France. Mfrs. chains, spark plugs.

Darby & Sons Co., Edward.—233 Arch St., Philadelphia, Pa. Mfrs. lockers.

D'Arcy Spring Co.—Kalamazoo, Mich. Mfrs. seat springs.

Darling Automobile Co.—Main and Franklin Sts., Auburn, Me. (Maxwell, Reo.)

Darling E. R.—138 Main St., Woonsocket, R. I. Garage.

Darling, K. C.—1686 Broadway, New York City. Second-hand cars; renting; supplies.

Darling Pump & Mfg. Co.—Williamsport, Pa. Mfrs. brass pipe fittings.

Darracq, Alexander.—12 Rue Eugène-Flachat, Paris. Borr at Bordeaux, Nov. 5, 1855. In 1891, M. Darracq organized



the firm of A. Darracq et Cie., 33 Quai de Suresnes, of which he is at present manager. In 1899, he was made chevalier of the Legion of Honor, and, in 1903, officer of the same order. He is an officer of the Mérite Agricole and of the Order

of the Crown of Italy, and president of the Syndical Chamber of the Cycle and Automobile.

Darracq et Cie., A.—33 quai de Suresnes, Paris, France. Mfrs. gasoline automobiles (Darracq cars).

Darracq Motor Car Co.—1989 Broadway, New York City. Importers Darracq cars. Est. 1902. Cap. \$50,000. G. M. MacWilliam, Pres.; C. D. Wilder, Treas.; Ben Wood, Sec. Dealers: Boston, Mass., A. F. MacWilliam, 171 Huntington Ave.; Chicago, Ill., J. T. MacWilliam, Mgr., 1502 Michigan Ave.; Los Angeles, Cal., F. E. Thayer, 1030 S. Main

St.; Philadelphia, Pa., International Motor Car Co., 514 N. Broad St.; Pittsburgh, Pa., E. D. Nevin, 307 Wood St.; Providence, R. I., Davis Automobile Co., 7 Dorrance St. Repair shop at 20 W. 60th St.

Darracq Motor Car Co.—171 Huntington Ave., Boston, Mass. (Darracq.)

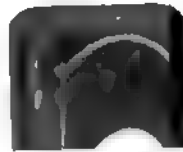
Darracq Motor Car Co.—1502 Michigan Ave., Chicago, Ill. (Darracq.)

Darracq-Serpellet et Cie.—Suresnes, France. Mfrs. steam automobiles (Serpellet cars); steam commercial automobiles (Darracq-Serpellet trucks).

Darrough Garage.—613 Throckmorton St., Fort Worth, Tex. Garage.

Dart Mfg. Co.—524 Sheffield Ave., Chicago, Ill. Garage.

Dash-board.—A screen, usually of metal, placed upright in front of a motor-



car, or in the rear of the motor, and used as a protection and a support for various apparatus, such as the spark-coil, sight-

feed lubricator and various indicating devices

Dash-pot.—A device for preventing sudden motion of some part of a piece of mechanism by utilizing the viscosity or inertia of a fluid. A simple form consists of a small vessel of liquid in which a piston moves quickly. Another form consists of a cylinder with an air-tight piston.

Dasse, Gérard.—Verviers, Belgium. Mfrs. automobile motors, gasoline automobiles.

Datz, Alois S.—Treas. Northwestern Motor Car Co., 1928-1930 N. 20th St., Philadelphia, Pa.

Daucher und Mauz.—Stuttgart, Germany. Mfrs. tops

Dauch, J. J.—Treas. Sandusky Foundry & Machine Co., Sandusky, O.

Dauer Auto Co.—24 Richmond St., Providence, R. I. (Franklin.)

Daveluy, A.—10 bd. Alsace-Lorraine, Amiens, France. Mfrs. siren horns.

Davenport & Co.—108 Hatton Garden, London E. C., England. Mfrs. speed indicators, gauges.

Davenport, A. M.—Pres. American Coil Co., Inc. cor. Wall and Cocasset Sts., Foxboro, Mass.

Davenport Auto Co.—Davenport, Ia. Garage.

Davenport Barber Fireproof Garage.—106½ Main St., N. Adams, Mass. (Stanley, Pope-Hartford.)

Davenport Cycle Co.—Davenport, Ia. (Maxwell.)

Davenport, E. W.—Treas. Duplex Roller Bushing Co., Belfast, Me.

Daves & McCune.—991 Main St., Riverside, Cal. (Moline.)

Davey, J. E.—Pres. The Auto Garage Co., Inc., 146-148 W. 39th St., New York City.

Davey Tire Guard Co.—399 Franklin St., Buffalo, N. Y. Mfrs. anti-skid devices.

David et Cie.—16, rue Oberkampf, Paris, France. Mfrs. motorcycles (Caesar).

David et Cie., J.—Geneva-Acacias, Switzerland. Mfrs. motorcycle motors; motorcycles (la Moto Reve).

David, Wm. P.—Bridgeport, Pa. (Maxwell.)

Davidson & Co., J. S.—Jamestown, N. Y. Mfrs. wrenches.

Davidson, Adam.—13th Ave. and Lake St., Melrose Park, Ill. Repairing.

Davies, Wm. L.—Pres. Acme White Lead & Color Works, Detroit, Mich.

Davis & Co., E. C.—155 Falls St., Seneca Falls, N. Y. Garage.

Davis & Co., S. H.—68 Portland St., Boston, Mass. Mfrs. speedometers.

Davis, A. R.—Sec., Treas. and Purch. Agt. Cleveland Motor Car Co., 1372 E. 12th St., Cleveland, O.

Davis Automobile Co., Inc.—7 Dorrance St., Providence, R. I. Repair shop, 79-81 Mathewson St. (Winton, Peerless, Locomobile, Oldsmobile, Cadillac, Thomas Flyer, Darracq.) Est. 1902. Cap. \$100,000. J. A. Foster, Pres.; Nelson S. Davis, Vice-Pres.; Fred L. Smith, Treas.; Walter G. Pierce, Sec. Garage. 100 cars. Repairing.

Davis Boat Works.—Sandusky, O. Mfrs. motorboats.

Davis-Bournonville Acetylene Development Co.—Room 1511, 90 West St., New York City. Mfrs. special automobile machinery.

Davis, E. R.—18 Park St., Rockland, Me. Garage.

Davis, F. A. W.—Sec. Pioneer Brass Works, 418-424 S. Penna St., Indianapolis, Ind.

Davis, F. M.—Pres. Davis Mfg. Co., Milwaukee, Wis.

Davis, F. S.—Designer C. H. Blomstrom Motor Co., Clark and Jefferson Aves., Detroit, Mich.

Davis, Dr. H. A.—Dickinson, N. D. (Buick.)

Davis, Henry.—Clarksdale, Miss. (Oldsmobile.)

Davis, H. M.—Mgr. New York branch Knox Automobile Co., 1595 Broadway, New York City.

Davis Mfg. Co.—Milwaukee, Wis. Mfrs. gasoline motors. Cap. \$50,000. Est. April, 1905. F. M. Davis, Pres.; E. J. Koch, Vice-Pres.; J. S. Church, Treas.; M. J. Church, Sec.

Davis, Nelson S.—Vice-Pres. Davis Automobile Co., 7 Dorrance St., Providence, R. I.

Davis, Newton H.—La Rue, O. (Ford.)

Davis, O. E.—Front Ave., Winchester, Ind. (Marmon, Premier, Ford, Reo.)

Davis, O. W.—Designer and Supt. Gearless Transmission Co., Rochester, N. Y.

Davis, R. B.—Vice-Pres. Lothrop Davis Co., 105 Main St., Tonopah, Nev.

Davis, R. L.—1003 W. Chestnut St., Louisville, Ky. Garage.

Davis Robe Co., Inc.—1307 Champlain Bldg., Chicago, Ill. Mfrs. automobile robes, miscellaneous wearing apparel.

Davis, Andrew.—Sec. Salisbury Wheel & Mfg. Co., Jamestown, N. Y.

Davis, Samuel Todd, Jr.—Pres. Locomobile Co. of America. B. Washington, D. C., Feb. 8, 1873. Ed. Columbian College Preparatory School, and Civil Engineer's degree from Rensselaer Poly-

technic Institute, Troy, N. Y. Director Pequonock National Bank, Bridgeport; Locomobile Co. of America, The Lorana Co., Ardsley Electric Co., Ardsley Water Co., Bridgeport Specialty Co., Long Island Motor Parkway, Inc. Mem. N. Y. Yacht,

A. C. A., Ardsley, Brooklawn Country, A. C. of Bridgeport, Algonquin, Seaside, Bridgeport Yacht, University (Bridgeport), University (N. Y.), Aero Club of America, N. Y. Motor Club. Res. 110 Waldemere Ave., Bridgeport, Conn. Office, 2 Main St., Bridgeport. In trade since June 13, 1899. First car used June 13, 1899. Recreations, golf squash.

Davis, W. B.—02 Ontario St., Cleveland, O. (Jewel.)

Davis, W. F.—Cor. Main St. and Park Ave., Waterbury, Vt. Garage.

Davison, C. A.—Vice-Pres. and Treas. Rochm & Davison, Ltd., 91-95 W. Woodbridge St., Detroit, Mich.

Davison, J. L.—Supt. Rainier Co., Saginaw, Mich.

Davit.—Pieces of timber or iron projecting over a vessel's side or stern, having tackle by which to raise a boat.

Davy, Humphrey.—35 W. 43rd St., New York City. Garage

Dawson Machine Co.—2 Sargent St., Worcester, Mass. Garage.

Dawson, H. Allan.—Pres. United Motor Car Co., Philadelphia, Pa.

Dawson, J. T.—Owensboro, Ky. (Cadillac)

Day, A. M.—With A. Elliott Ranney & Co., 1851 Broadway, New York City.

Day, A. R.—Supt. Sprague Umbrella Co., Norwalk, O.



Day Auto Co.—1407 S. 12th St., Kansas City, Mo. Garage.

Day, B. C.—Mgr. Chicago Branch, Winton Motor Carriage Co., Chicago, Ill.

Day Foundry Co., The.—Illinois and Mary Sts., Buffalo, N. Y. Mfrs. brass, bronze, aluminum and copper castings, bronze metals.

Day, George H.—Founder of the Association of Licensed Automobile Manufacturers. B. Brooklyn, Conn., April 3, 1851. Died at Daytona, Fla., November 21, 1907. Long associated with Col. A. A. Pope in the manufacture and sale of Columbia bicycles, he turned his attention to automobiles in the middle nineties and became president of the Electric Vehicle Co., which acquired a controlling interest in the Selden patent. The formation of the A. L. A. M. followed in 1903, and Mr. Day became its general manager, a position which he held until early in 1907, when failing health led to his retirement. He continued to take part in the conduct of the affairs of that body until his death, which occurred very suddenly the week after the 1907 show of the A. L. A. M., from an affection of the heart.

Day, Louis J.—Purch. Agt. Schacht Mfg. Co., 2727-2731 Spring Grove Ave., Cincinnati, O.

Day, Dr. W. A.—Sparta, Minn. (Waltham.)

Daye, William S.—Division St., Amsterdam, N. Y. (Royal, Cadillac, Haynes, Waltham.)

Dayton Automobile Co.—Dayton, O. Stoddard-Dayton.)

Dayton Electrical Mfg. Co.—87 St. Clair St., Dayton, O. Mfrs. primary and storage batteries, electric generators and switches, magnetos and ignition dynamos, spark coils, spark plugs, spark timing devices.

Dayton Folding Tonneau Co.—1141 N. Main St., Dayton, O. Mfrs. folding tonneaus and automobile bodies. Not incorporated. Est. Nov. 1, 1904. J. D. Artz, sole owner.

Dayton Malleable Iron Co.—Dayton, O. Mfrs. malleable iron castings.

Dayton Mfg. Co.—2240 E. 3rd St., Dayton, O. Mfrs. storage batteries, lamps.

Dayton Motor Car Co.—Dayton, O. Makers of the Stoddard-Dayton car; first marketed 1905. Eight models made since. Cap., \$50,000. J. W. Stoddard, Pres.; C. G. Stoddard, Vice-Pres. and Gen. Mgr.; J. F. Campbell, Sec. and Treas.; H. J. Edwards, Chief Engineer; R. T. Houk, Supt.; Benj. Rhodes and H. N. Anderson, Asst. Supts.; H. W. Hayden, Pur. Agt.; C. S. Jameson, Sales Mgr.; Fred N. Coats, Asst. Sales Mgr.; F. A. Barker, Advt. Mgr. Agents and dealers: Atlanta, Ga., Field Auto Co., 103 Pryor St.; Birmingham, Ala., Bir-

mingham Garage; Boston, Mass., Park Square Auto Station, 43 Columbus Ave.; Buffalo, N. Y., J. A. Cramer, 737 Main St.; Chicago, Ill., McDuffee Automobile Co., 1501 Michigan Ave.; Chattanooga, Tenn., Wallace Buggy Co.; Cincinnati, O., The Auto-Motor Car Co., 804 Sycamore St.; Cleveland, O., Harry S. Moore, 1761 Crawford Road; Columbia, S. C., E. A. Jenkins Motor Co., 1216 Main St.; Columbus, O., O. G. Roberts & Co., 152 N. 9th St.; Coshocton, O., J. P. Forbes; Dayton, O., Dayton Automobile Co.; Denver, Colo., Wood & Barnett, 1333 Broadway; Des Moines, Ia., Sears-Nattlinger Auto Co.; Detroit, Mich., Wm. F. V. Neumann & Co., 1342 Woodward Ave.; Fort Wayne, Ind., Randall Motor Car Co., 216 Berry St.; Fort Worth, Tex., Ray-Wortham Automobile Co., 609 Throckmorton St.; Holyoke, Mass., Burrington Motor Co.; Indianapolis, Ind., Fisher Automobile Co., 330 N. Illinois St.; Jacksonville, Fla., Fred E. Gilbert, 37 Forsyth St.; Kansas City, Mo., Ettwein Motor Car Co., 3701 Main St.; Lexington, Ky., Blue Grass Auto Co.; Los Angeles, Cal., Norman W. Church, 229 I. W. Hellman Bldg.; Louisville, Ky., Longest Bros. Co., 821 3d Ave.; Memphis, Tenn., Jerome P. Parker Co.; Minneapolis, Minn., American Automobile Co., 220 S. 6th St.; Mobile, Ala., Mobile Auto Co., 58 Joseph St.; Montgomery, Ala., Mosley-Htigler Electric Co.; Nashville, Tenn., Rock City Auto Co.; New Haven, Conn., Central Automobile Co.; New Orleans, La., Independent Auto Co., Ltd., 1016 Common St.; New York City, Atlantic Motor Car Co., 1776 Broadway; Ottawa, Ont., Wilson Automobile Co., Ltd., 142 Bank St.; Omaha, Neb., Deright Automobile Co., 1814 Farnam St.; Pittsburg, Pa., Keystone Automobile Co., 5905 Centre Ave.; Pittsfield, Mass., Philip A. Lowe, 103 North St.; Providence, R. I., Nock Auto Co., 141 Dyer St.; Philadelphia, Pa., Hamilton Auto Co., 206 N. Broad St.; Rochester, N. Y., A. M. Zimbrich, 45 South Ave.; St. Paul, Minn., F. W. Ramaley, 650 Grand Ave.; Shreveport, La., F. W. Pallis, Spring St.; Springfield, Mass., The Woodward-Reopell Co.; St. Louis, Mo., Van Automobile Co., 4700 Washington Ave.; San Antonio, Tex., D. W. McElroy & Co.; Syracuse, N. Y., Chase Motor Truck Co.; Toledo, O., Craig Garage Co., 1213 Madison Ave.; Toronto, Ont., The Automobile & Supply Co., 24 Temperance St.; Troy, N. Y., Lucey Motor Car Co., 231 River St.; Wichita, Kan., Wichita Automobile Co.; Houston, Tex., Houston Motor Car Co.

Dayton, F. E.—Sales and Adv. Mgr. Electric Vehicle Co., Hartford, Conn., previously Boston and Chicago Branch

Mgr. Office Hartford, Conn. In the trade since Dec., 1901.

Daytona Auto Transit Co.—Daytona, Fla. (Cadillac.)

Dead.—Neither moving nor imparting motion, as an axle which does not rotate, one which does not communicate motion to wheels, etc., but simply turns with them.

Dead-axle.—See Axle, Dead.

Dead-center.—See Center, Dead.

Dead-flat.—The broadest frame in a vessel.

Dead-heat.—A race in which the competitors come out even and there is no winner.

Dead-light.—A shutter for protecting a cabin window or porthole in foul weather.

Dead-point.—See Center, Dead.

Dead-rising.—That part of a boat which lies aft between the keel and the floor-timbers toward the stern-post.

Dead-weight.—A weight or load which is constant in position and amount. (2) Weight of a car empty.

Dead-wood.—A mass of wood built up on the keel of a vessel to support the cant-timbers.

Deal, R. B.—Lacota, Mich. (Waltham.)

Dean and Burden Bros., Ltd.—Salisbury, England. Mfrs. marine motors and gasoline automobiles (Scout cars).

Dean & Co., John M.—793 Westminster Ave., Providence, R. I. Garage.

Dean & Cook.—Rushville, Ind. (Reo.)

Dean Bros.—160 N. Ionia St., Grand Rapids, Mich. (Jackson.) Garage.

Dean, W. A.—427 Washington Ave., North Newark, N. J. Garage.

Dearborn Drug & Chemical Works.—Chicago, Ill. Mfrs. oils.

Deasy Motor Car Mfg. Co., Ltd., The.—Coventry, England. Mfrs. gasoline automobiles (Deasy cars).

Deaton, A.—Mgr. Central Mfg. Co., Connersville, Ind.

DeBarres Automobile Co.—Office and salesroom, 1966-1968 Broadway; garage, 587-589 Park Ave., New York City. Importers and head agency for U. S. and Canada, Delahaye and Piliat cars. Est. May, 1906. Wm. H. Barnard, Pres. and Treas.; Wm. H. MacIlroy, Sec. Garage, 45 cars. Repairing.

De Bertha, Louis.—Milford, Pa. (Northern, Buick, Cadillac.)

De Boisse, J.—85, rue Traverssière, Billancourt (Seine), France. Mfrs. lubricators, circulating pumps.

Deca.—Prefix indicating that the unit of measure to which it is joined is multiplied by ten; for example, one decametre equals ten metres.

De Cant.—3 Lansing Block, Watertown, N. Y. (Northern.)

Decarburization.—The removal of car-

bon from cast iron by the puddling process (q. v.), or the Bessemer process (q. v.).

De Caserta, Manuel.—43 Cedar St., New York City. Mgr. New York branch The Globe Automobile Exporters.

Decatur Automobile Club.—Tom W. Pitner, Sec. Decatur, Ill.

Decauville, Société Nouvelle des Établissements.—Corbeil (Seine-et-Oise), France. Mfrs. gasoline automobiles (Decauville cars).

Decauville, Société Nouvelle des Établissements.—Petit-Bourg (Seine-et-Oise), France. Mfrs. automobile motors, gasoline commercial automobiles (Decauville omnibus).

Dechartres, E.—3, cité des Envierges, Paris, France. Mfrs. marine motors.

Decl.—A prefix indicating that the unit of measure to which it is joined is divided by ten. Thus a deciliter is the tenth part of a litre.

Deck.—A platform laid longitudinally over a boat's transverse beams.

Deck-ring.—A ring with a cover, used on launches for giving access to the gasoline tank, steering-gear, shaft-bearings or other places where an opening with a cover is desirable.

Deck-light.—A thick piece of ribbed glass let into a deck to light the space below it.

Deck, Turtle.—A rounded deck over the forward part of a boat's hull designed for shedding water.

Deck Bros.—20 Indiana St., Buffalo, N. Y. Mfrs. brass castings.

Decker, J. B.—Supt. Sheldon Axle Co., Wilkesbarre, Pa.

Decker, W. M.—Baltimore, Md. (Monarch.)

Deckers, W., H.—95 Southampton St., Buffalo, N. Y. Garage.

Declutch.—To disengage or release a clutch

Decoudun, J.—101, rue du Faubourg St. Denis, Paris, France. Mfrs. gauges.

De Dietrich Import Co.—3 W. 44th St., New York City. Importers Loraine De Dietrich cars.

De Dion, Marquis Albert.—Avenue de la Grande Armée, Paris, and at Maubreville by Carquefou (Loire Inferieure.) Constructing engineer of automobiles; founder and vice-president of the A. C. F. Founder and president of the Automobile Syndical Chamber, principal founder and honorary president of



the Aero Club of France. One of the principal promoters of the automobile industry in France; organizer and manager of works at Puteaux, which employs 3,000 workmen.

De Dion, Bouton et Cie.—quai National, Puteaux (Seine), France. Mfrs. automobile, motorcycle and marine motors; tricar, quads, tricycles, steam commercial, gasoline commercial and gasoline automobiles (De Dion); spark plugs.

Deemster Machinery Co., W. R.—Kansas City, Mo. (Maxwell.)

Deere Plow Co., John.—Omaha, Neb. (Moline.)

Defiance Chain Co., The.—143 Federal St., Boston, Mass. Mfrs. tire chains.

Defiance Machine Works.—Defiance, O. Mfrs. special automobile machinery.

Deflection.—Deviation from an original position or direction, e. g., the sagging of a beam, girder, or spring, when supported at both ends.

Deflector.—See Baffle-plate.

Deflector, Spray.—The same as spraying cone. See Cone, Spraying

De Foe Boat & Motor Works.—Bay City, Mich. Mfrs. motorboats.

Deformation.—A general term signifying an alteration, permanent or otherwise, in the shape of a body.

De Fornier.—7, ave de la Capelette, Marseilles, France. Mfrs. non-skids.

Degaile.—85, rue Menilmontant, Paris, France. Mfrs. transmission gears.

De Garmo, T. F.—Gen. Sales Agt. Grip Nut Co., 152 Lake St., Chicago, Ill.; 500 5th Ave., New York City.

Degree.—A unit of various kinds, such as of temperature, measurement, etc.

De Haven Bros.—87 S. Center Ave., Chicago, Ill. (De Haven.)

Deitz, F. H.—Sec. and Treas. Bassett-Pressley Co., Western Reserve Bldg., Cleveland, O.

De Kalb Automobile & Garage Co.—142 W. Main St., De Kalb, Ill. (Ramblor, Ford.) Est. 1906. H. M. McGuckin, prop. and owner. Garage, 13 cars. Repairing.

De Klyn, W. F.—Norwalk, Conn. (Rapid.)

Delabays, J.—25 bis, rue de Carouge, Geneva, Switzerland. Mfrs. bodies.

De la Buire, Société Anonyme des Automobiles.—place de la Buire, Lyons, France. Mfrs. gasoline automobiles (La Buire cars).

De la Chapelle Frères et Cie.—St. Chamond (Loire), France. Mfrs. motorcycles. (Stimula.)

De la Chesnaye, Paul.—Automobile dealer. B. France, Aug. 13, 1872. Ed. Paris University (Law). Director Cantono Electric Tractor Co., Newark, N. J. Mem. A. C. of France, Cercle d'Eserine, Res., 414 W. 118th St., N. Y.; Paris, 21 rue Nitor. Office, 2148 Broadway, New

York. In trade since 1901. Used cars since 1895. Recreation, fencing. Won championship 1899.

Delage et Cie.—102 rue Baudin, Levallois, Paris, France. Mfrs. gasoline automobiles (Delage cars).

Delahaye et Cie, Société des Automobiles.—10 rue du Banquier, Paris, France. Mfrs. gasoline automobiles and commercial cars (Delahaye).

Delamare-Deboutteville.—A Rouen inventor. In 1883 he constructed a carriage which was actuated by gas under pressure, and which appears to have been the very first fast vehicle of the kind that really made a trip upon a common road.

Delamare-Deboutteville was also the originator of important improvements in gas generators and high-power motors.

De Lameter, E. B.—50 Market St., Poughkeepsie, N. Y. Garage.

De Lamater, J. W.—Vice-Pres. Archer & Co., 1597 Broadway, New York City.

De Lancy Garage.—22nd and Pine Sts., Philadelphia, Pa. Garage. (Earl.)

Delaney & Son, D.—Liberty and Hamilton Sts., Newark, N. J. Mfrs. leaf springs.

Delaunay - Belleville, Établissements.—St. Denis, Paris, France. Mfrs. gasoline automobiles (Delaunay-Belleville cars).

Delaware Auto Storage & Repair Co.—11th and West Sts., Wilmington, Del. (Pope-Waverley.)

Delaware Ave. Garage.—257 Delaware Ave., Buffalo, N. Y. Garage.

Delaware Seamless Tube Co.—Auburn, Pa. Mfrs. steel tubing.

De Lisser, Horace.—Pres. Ajax-Grieb Rubber Co., Trenton, N. J.

Delivery.—The discharge of a liquid by a pump. "Rate of delivery" is the usual expression for the amount of fluid pumped per minute.

Delivery-valve.—See Valve, Delivery.

Dell, Arthur.—Asst. Treas. Miami Cycle Mfg. Co., Middletown, O.

Dell Rapids Imp. Co.—Colton, S. D. (Ramblor.)

Delleani, A.—12 via Moncaliére, Turin, Italy. Mfr. radiators.

Delmar Motor Car Co.—St. Louis, Mo. Cap. \$3,000. Incorporators: C. C. Morris, George Neff, E. P. Nelson. Garage.

Deloffre, Auguste.—32 route de la Gare. Le Cateau (Nord), France. Mfr. circulating pumps.

Delta Mfg. Co.—Bloomfield, N. J. Mfrs. dry batteries, spark plugs. Est. 1901. Officers: William S. Benson, Gen. Mgr.; Peter I. Quinn, James Curren.

De Luxe Mfg. Co.—Buffalo, N. Y. Mfrs. spark plugs.

De Luxe Motor Car Co.—Cor. Clark and Jefferson Aves., Detroit, Mich. Makers of the De Luxe car, first mark-

eted January, 1907. Cap. \$1,000,000. N. M. Kaufman, Pres.; Geo. M. Verity, Vice-Pres.; D. W. Kaufman, Sec., Treas. and Gen. Mgr.; F. S. Davis and J. A. Herzog, Designers; J. A. Locher, Supt.; W. A. Westcott, Purch. Agt.; Geo. Horn, Asst. Pur. Agt.; H. S. Leyman, Sales Mgr.; T. F. Larson, Advt. Mgr. Agents and dealers: Bellefield Motor., 4518 Henry St., Pittsburg, Pa. B. F. Benson, 1311 Keystone Bldg., Pittsburg, Pa. City Hall Automobile Co., 66 Fulton St. De Luxe Motor Sales Co., Chicago, Ill. Lakedel Automobile Co., 5143 Delmar Blvd., St. Louis, Mo. McDuffee Automobile Co., The, 228-232 Wisconsin St., Milwaukee, Wis. McElroy & Co., D. W., 408-410 Market St., San Antonio, Tex. McDuffee Automobile Co., 1501-3-5 Michigan Ave., Chicago, Ill. Motor Sales Co., 251 Jefferson Ave., Detroit, Mich. Motor Sales Co., 1771 Broadway, New York City. Pacific Automobile Co., 1028 S. Main St., Los Angeles, Cal. Reliance Motor Car Co., 216 E. 3rd St., Cincinnati, O.

De Luxe Motor Sales Co.—216 E. 3rd St., Cincinnati, O. (De Luxe.)

De Magnin, A.—Asst. Mgr. Panhard & Levassor (American branch), 1881 Broadway, New York City.

Demar Co., J. E.—244-8 W. 49th St., New York City. Mfrs. auto tops, slip covers and fittings.

Demarest & Co., A. T.—335 5th Ave., New York City. Mfrs. bodies. (Panhard.)

Demarets et Cie., G.—208 rue St. Maur, Paris, France. Mfrs. gauges, horns.

Demeester.—22 ave de la Grande Armée, Paris, France. Mfrs. gasoline automobiles (Demeester cars), motorcycles.

Demler, Wm.—18 Kennedy St., Bradford, Penn. Garage.

Demmerle & Co.—248 W. 23rd St., New York City. Mfrs. wearing apparel, caps, gloves and gauntlets.

Demonbrum, B. R.—113 Public Sq., Nashville, Tenn. (Autocar.)

De Mooy Bros.—765-767 Wilson Ave., Cleveland, O. Mfrs. gasoline marine motors, motorboats.

Demorest, A. L.—New Haven, Conn. Mfrs. wood and metallic bodies.

Demory, A. R.—Gen. Supt. Timken Roller Bearing Axle Co., Canton, O.

Dempster Mill Mfg. Co.—Beatrice, Neb. Garage.

Demster Machinery Co., The W. R.—16th and Walnut Sts., Kansas City, Mo. Agts. Maxwell cars and mfrs. carburetors, automobile engines, transmissions to order only; garage, supplies and general repairing. Est. since 1900. Cap. \$15,000. W. R. Demster, Pres. and Gen. Mgr.; C. V. Eyke, Vice-Pres. and Sec.; J. D. Estes, Treas. Garage, 100 cars.

Demster, W. R.—Pres. and Gen. Mgr.

W. R. Demster Machinery Co., N. W.—Cor. 16th and Walnut Sts., Kansas City, Mo.

Denatured.—A term applied to alcohol which has been adulterated in order to unfit it for use as a beverage. See Alcohol. Denatured.

Dench, C. B.—455 W. 11th St., Erie, Pa. (Corbin.)

Dénes, Friedmann und Co.—14 Stubenring, Vienna, Austria. Mfrs. ball bearings.

Deneau et Cie.—86 bis, rue de Rome, Paris, France. Mfrs. wearing apparel, hats and caps.

Denich, A.—144 rue St. Maur, Paris, France. Mfrs. acetylene and oil lamps.

Denison, L. E.—Cairo, Ill. Garage.

Denman, Chas. S.—Care Des Moines Water Works, Des Moines, Ia. (Woods.)

Dennison, Julien.—New Haven, Conn. (Atlas.)

Denniston, E. E.—184 W. Mohawk St., Buffalo, N. Y. Mfrs. automobile tops, supplies.

Denny, C. B.—Treas. American Locomotive Automobile Co., Providence, R. I.

Densimeter.—An apparatus used for measuring the density or specific gravity of liquids. A densimeter is a "hydrometer" provided with a graduated rod which indicates, through a single reading, the density of the liquid (alcohol, gasoline, etc.) to be tested, and into which it is immersed. The apparatus has an invariable weight and sinks into the liquid so much the more in proportion as the density of the liquid is less. See Areometer and Hydrometer.

Density.—The quantity of material or matter contained in a unit volume. The specification of density, unlike specific gravity, always requires the use of two units—one of volume, and the other of mass. For example, density may be given in pounds per cubic foot, tons per cubic yard, grammes per cubic centimetre, etc. The following list gives the density of a few metals: Molten aluminum, 2.57; molten copper, 8.87; forged iron, 7.85; nickel, 8.50; molten zinc, 7.10; molten silver, 10.45; molten tin, 7.29; mercury, 13.59; molten lead, 11.34.

Density, Electric.—The quotient of the intensity of a current by the section of the conductor in which it circulates. It is expressed in amperes per square millimetre. The density of a current in a wire should not exceed a certain value lest heating occur. It is variable, occurring as to whether the wire is naked or insulated, or in the open air or in a conduit.

Denton, W.—Vice-Pres. Missouri Valley Auto Co., 1112-14 E. 15th St., Kansas City, Mo.

Denver Automobile Trade Assn.—Denver, Colo.

De Ploeg, S.—58 rue Michel-Bizot, Paris, France. Mfrs. spark plugs.

Depolarizer.—An oxidizing substance used for fixing the hydrogen derived from the decomposition of the acid by the zinc in batteries. In the Leclanché cell and its derivatives (dry cells) the depolarizer employed is black oxide of manganese surrounding the carbon.

Deposit.—Same as scale and fur. q. v.

Depot Carriage & Baggage Co.—Kansas City, Mo. (Rambler.)

De Prez, Eugene.—Mgr. Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.

Derbab Mfg. Co.—Broad St., Lynn, Mass. Garage.

Derbler, J. B.—Mgr. Haynes Automobile Co., 1420 Michigan Ave., Chicago, Ill.

Derby Auto Co.—Seymour Ave., Derby, Conn. (Franklin, Haynes, Cadillac.)

Derby Mfg. Co.—Trenton, N. J. Mfrs. carburetters.

De Retz.—15 rue de Turenne, Aras, France. Mfrs. carburetters.

Deright Auto Co.—1816 Farnum St., Omaha, Neb. (Stoddard Dayton, Ford, Mason, Premier, Rapid.)

De Rivas, F. M.—Mutual Bldg., Mexico City, Mex. (National, Logan.)

Derozier, A.—Nemours, Seine-et-Marne, France. Mfrs. motorcycles. (Athena.)

Derry, Thos.—466 Vermont St., Buffalo, N. Y. Garage.

De Ruyter de Messine.—125 blvd. de la Senne, Brussels, Belgium. Mfrs. bod-ies.

Deschler, August.—18-20 E. Water St., Chillicothe, O. Mfrs. axles, hubs, gaso- line automobile motors.

Desclée, G. et Cie.—171 ave de la Reine, Brussels, Belgium. Mfrs. leather tires, non-skids.

Desclée et Cie., J.—159 ave Malakoff, Paris, France. Mfrs. non-skids.

Deselbrow Motor Car Co.—New Roch-elle, N. Y. Garage.

Desert Automobile Co.—71 S. State St., Salt Lake City, Utah. (Haynes, Au- tocar.)

Desjardin.—10 rue St. Pierre, Versail-les, France. Mfrs. leather tires.

Deshler, O. R.—Bangor, Pa. (Pope- Hartford.)

Desmarais & Co.—Prospect St., Bris- tol, Conn. Gasoline automobile manu- facturers.

Desmond, John.—Sec. Atlantic Motor Car Co.—1776 Broadway, New York City.

D'Espine, Achard et Cie.—52 quai de la Marne, Paris, France. Mfrs. gasoline

commercial automobiles (D. A. G. trucks).

Despouts.—150 rue Victor-Hugo, Le- vallois, Seine, France. Mfrs. tire pumps, acetylene lamps, radiators, horns.

Destribatis, Louis P.—Supt. Ajax- Grieb-Rubber Co., Trenton, N. J.

Detector.—A small electrical device consisting of a galvanometer or current indicator and several primary cells. It is employed for testing the continuity of electrical circuits.

Detent.—A device for stopping or checking motion, as a pin, lever, pawl, etc.

Detent-pin.—See Pin, Detent.

Detroit Auto Marine Co.—82 Congress St. E., Detroit, Mich. Mfrs. gasoline marine motors.

Detroit Auto. Specialty Co.—909-911 Greenwood Ave., Detroit, Mich. Mfrs. tool boxes, dashes and fenders, radiators, battery boxes.

Detroit Auto Top Co.—Detroit, Mich. Mfrs. automobile tops.

Detroit Automobile Top Co.—245 Jef- ferson Ave., Detroit, Mich. (Winton.)

Detroit Automobile Trade Assn.—De- troit, Mich.

Detroit Cap Mfg. Co.—11-17 Wood- bridge St. W., Detroit, Mich. Mfrs. wearing apparel, caps.

Detroit Carriage Co.—Cor. Clay and St. Aubin Aves., Detroit, Mich. Mfrs. automobile bodies. Cap. \$50,000. Est. in 1898. Herman Roehm, Pres.; Henry W. Patorn, Vice-Pres.; Albert H. Roehm, Sec., Treas. and Gen. Mgr.

Detroit Copper & Brass Rolling Mills.—Detroit, Mich. Mfrs. brass and cop- per sheet and rod, brass and copper me- tals, brass and copper tubing.

Detroit Forging Co.—Detroit, Mich. Mfrs. drop forgings.

Detroit Gas Engine & Machine Co.—Congress St., Detroit, Mich. Garage.

Detroit Leather Specialty Co.—De- troit, Mich. Mfrs. gloves and gauntlets.

Detroit Lubricator Co.—Trumbull and Lincoln Aves. and G. T. Ry., Detroit, Mich. Mfrs. forced feed oil pumps, lu- bricators, oilers. Member M. & A. M. Cap. \$1,000,000. Est. since 1879. H. C. Hodges, Chairman; C. H. Hodges, Pres.; C. B. Hodges, Vice-Pres.; F. W. Hodges, Sec. and Treas.; H. I. Lord, Mgr. Sales Dept.; Wm. P. Wilson, Mgr. Oil Pump Dept. Selling agents: Brandenburg & Co., New York, Chicago and Detroit.

Detroit Motor Car Supply Co.—1250 Jefferson Ave., Detroit, Mich. Mfrs. storm aprons and curtains, wood and metallic bodies.

Detroit-Oxford Mfg. Co.—Oxford, Mich. Garage.

Detroit River Boat & Oar Co., The.—Wyandotte, Mich. Motorboat manufac- turers.

Detroit Rubber Stamp Co.—99 Griswold St., Detroit, Mich. Mfrs. name plates.

Detroit Sanitary Supply Co.—Detroit, Mich. Mfrs. brass pipe fittings.

Detroit Screw Works.—Riopelle and Franklin Sts., Detroit, Mich. Mfrs. set and cap screws, steel taper pins, studs, coupling bolts, nuts. Cap. \$100,000. Est. 1880. W. B. Pearson, Pres.; Geo. Thrall, Sec. and Treas.; F. P. Johnston, Vice-Pres. and Mgr.

Detroit Seamless Steel Tube Co.—833 River St., Detroit, Mich. Mfrs. axles, steel tubing.

Detroit Steel Products Co.—91 E. Fort St., Detroit, Mich. Mfrs. automobile springs, drop forgings. Mem. M. & A. M. Cap. \$75,000. Est. 1904. Walter S. Russell, Pres.; John H. Avery, Vice-Pres.; Clair L. Barnes, Sec. and Gen. Sales Mgr.; John G. Rumney, Treas. and Gen. Mgr.; James H. Herron, Chief Engineer; A. J. Pullan, Supt.

Detroit Stoker & Foundry Co.—N. Grand Blvd. and Riopelle St., Detroit, Mich. Mfrs. gray iron castings.

Detroit White Lead Works.—5 Ohio St., Buffalo, N. Y. Mfrs. paints, varnishes.

Detroit White Lead Works.—532-560 E. Milwaukee Ave., Detroit, Mich. Mfrs. colors, color varnishes and varnishes for automobile finishing. Cap. \$700,000. Est. since December, 1880. Ford H. Roger, Pres.; Geo. Preck, Vice-Pres.; H. B. Levan, Treas.; H. Duffield, Sec.

Detroit Wire Spring Co.—295-305 Congress St., W., Detroit, Mich. Mfrs. automobile and carriage seat springs. Cap. \$30,000. Est. March, 14, 1906. Falconer O'Brien, Pres.; Charles T. Chenevert, Vice-Pres.; John D. Chenevert, Sec. and Treas.

Detroit Wrench Co.—Tolsma Bldg., 45 State St., Detroit, Mich. Mfrs. wrenches.

Deutsch, Henry (de la Meurthe).—4 Place des Etats Unis, Paris. Officer of the Legion of Honor; head (with his father, Emile) of the house of Le Fils de A. Deutsch, for the sale of mineral and vegetable oils and the refining of petroleum. He is one of the founders of the A. C. F.; donor of the 100,000 francs



prize won by Santos-Dumont in 1901; and founder of a prize for the automatic starting of automobiles.

Devil.—See Sprag.

Deutscher Luftschiffer Verband.—(German Aero Club), Silbermannstrasse 14, Strassburg, Germany. Member F. A. I., H. W. L. Moedebeck, Sec.

Deutsche Samson.—**Leder-Pneumatik Gesellschaft.**—Mittelstrasse 46, Berlin, Germany. Mfrs. Non-skids (Samson bands.)

Deutsche Signalinstrumentenfabrik Pfretzschner und Martin.—Markneukirchen, Saxony, Germany. Mfrs. horns.

Deutsche Triumph Fahrradwerke Actien Gesellschaft.—Doos-Nürnberg, Germany. Motorcycles (Triumph).

Deutsche Velographfabrik Gross.—Görschenstrasse 35, Berlin, Germany. Mfrs. speed indicators.

Deutsche Waffen-und Munitionsfabriken.—Dorotheenstrasse 44, Berlin, Germany. Mfrs. ball bearings.

Deville, E.—Grand-Croix, Loire, France. Mfrs. jacks.

De Vice, John J.—Pur. Agt. Racine Boat Mfg. Co., Riverside, Muskegon, Mich.

Devine, Wm.—Foreman J. E. Loneragan & Co., 211-15 Race St., Philadelphia, Pa.

Devlin & Co.—1407 Michigan Ave., Chicago, Ill. Garage.

Devoe, F. W. & C. T. Reynolds Co.—Fulton and William St., New York City. Mfrs. varnishes.

Dewey, F. S.—Marlboro, Mass. Garage.

Dewey, Godfrey.—Mgr. Adirondack Auto Co., Lake Placid, N. Y.

Dewey, M. A. Jr.—Hd. automobile dept. New York Sporting Goods Co., 17 Warren St., New York City.

Dewhurst Motor Car Co.—136 W. Main St., Lexington, Ky. (Queen.)

De Witt Auto Co., The.—248-250 W. 80th St., New York City. Est. 1905. Cap. \$5,000. E. J. Cabot, Pres. and Mgr.; F. D. De Witt, Treas.; W. A. De Witt, Sec. Garage. 125 gasoline and 50 electric cars. Repairing; recharging electrics.

De Witt, Fred.—Hd. of bicycle and motorcycle dept. New York Sporting Goods Co., 17 Warren St., New York City.

De Witt, T. D.—Treas. The De Witt Auto Co., 248-50 W. 80th St., New York City.

De Witt, W. A.—Sec. The De Witt Auto Co., 248 W. 80th St., New York City.

Diagram.—A mechanical plan or outline as distinguished from a perspective drawing. An "indicator diagram" is a tracing drawn automatically on an "indicator-card," by a steam-engine indicator as showing the pressure in the cylinder at every stroke. For explosion motors, which, running at a very high angular speed, do not permit of the taking of a diagram by such a process. The "mano-

graph" is usually employed. See Manograph.

Dial.—In general, a disk or plate on which are marked graduations which enable the position of some form of pointer or index to be read off.

Diamagnetic.—A body which is repulsed by a magnet, instead of being attracted, such as nickel, cobalt and all magnetic bodies. Such repulsion, however, is very slight, and can be observed only with a very strong magnet. A bar of a diamagnetic metal, placed in a magnetic field, tends to place itself across the lines of force, that is to say, crosswise with respect to the line of the poles.

Diamant Fahrradwerke.—Reichenbrand, Saxony, Germany. Mfrs. motorcycles (Diamant).

Diametral Pitch.—See Pitch-circle.

Diamond Chain Mfg. Co.—Indianapolis, Ind. Mfrs. chains for power transmission, automobile parts. Member M. & A. M. Cap. \$300,000. Est. 1890. L. M. Wainwright, Pres.; A. D. Johnson, Sec.

Diamond Motor Car Co.—1160 S. Main St., Los Angeles, Cal. (Apperson, Northern, Waltham.)

Diamond Porcelain Co.—Trenton, N. J. Mfrs. metal polishes.

Diamond Rubber Co., The.—Akron, O. Mfrs. rubber tires of all kinds and mechanical rubber goods. Member M. & A. M. Cap. \$5,000,000. Est. 1896. Francis A. Hardy, Pres.; Arthur A. Marks, Vice-Pres.; William B. Miller, Sec.; Andrew H. Noah, Treas. Branches: Boston, 174 Columbus Ave.; Buffalo, 715 Main St.; Chicago, 1523-31 Michigan Ave.; Cleveland, 1514 Euclid Ave.; Denver, 1735 Arapahoe St.; Detroit, 258 Jefferson Ave.; Los Angeles, 1207-09 Main St.; Minneapolis, 117 S. 6th St.; New York, 1876 Broadway; Oakland, 108-12 Telegraph Ave.; Philadelphia, 304-06 N. Broad St.; St. Louis, 3963-65 Olive St.; Toronto, 73 Adelaide St., W.

Diamond State Steel Co.—Wilmington, Del. Mfrs. iron and steel (bar).

Diamond T. Motor Car Co.—Chicago, Ill. Mfrs. gasoline automobiles.

Diaphragm.—A thin disk, usually flexible, of metal, rubber, etc.

Diaphragm Pump.—See Pump, Diaphragm.

Diaphragm Regulator.—See Regulator, Diaphragm.

Diatto-Clément, Societa Automobili.—Corso Frejus, Turin, Italy. Mfrs. gasoline automobile (Diatto-Clément cars).

Dibert, Dr. C. C.—Buffalo Falls, Pa. (Waltham.)

Dicker Ward.—Sec., Treas. and Supt. Sterling Motorcar Co., 180-84 Water St., Binghamton, N. Y.

Dickerson, E. N.—Stoveall, N. C. (Waltham.)

Dickey, E. J.—Clerk, Putnam Motor Mfg. Co., 57 Lebanon St., Springfield, Mass.

Dickinson, J. B.—Niantic, Conn. and New London, Conn. (Dolson, Logan.)

Dickson, Geo. M.—Sales and Advt. Mgr. National Motor Vehicle Co., E. 2nd St., Indianapolis, Ind.

Dickson, J. D.—113 Bellevue Ave., Newport, R. I. Garage.

Did'er, L.—7 rue Mercouer, Paris, France. Mfrs. plugs, make and break.

Die.—A tool used for cutting an external or "male" thread on a cylindrical piece. When used by hand it is fitted into a frame provided with handles, called a "stock," and when used in a machine it is held in a "die-holder." A die is really a hardened steel nut, divided into two parts, the ends of the threads where they are cut across serving as cutting edges for producing the new thread which is to be cut.

Dieble, Wm.—904 Lippincott Bldg., Philadelphia, Pa. Mfrs. spark plugs.

Diebold Auto Co.—5th and McKinley Sts., Canton, O. (Buick, Thomas Flyer, Franklin.)

Dieckman, C. F.—Supt. Meyrowitz Co., Inc., 104 E. 23rd St., New York City.

Dieffendorf, W. H.—Chief Engineer New Process Ray Hide Co., 500-514 Plum St., and officer of Syracuse Aluminum & Bronze Co., 520 Leavenworth Ave., Syracuse, N. Y.

Diehon, J. T.—Pres. The Frantz Body Co., cor. Stanton Ave. and Gety St., Akron, O.

Diem, E., et R. Poëy.—62 bis, ave. Parmentier, Paris, France. Mfrs. acetylene and oil lamps.

Dien, Ch.—43-45 W. 34th St., New York City. Agent Edouard Dubied & Co., Couvet, Switzerland.

Diesel Cycle.—See Cycle, Diesel.

Dieteren Frères.—54 chaussée de Charleroi, Brussels, Belgium. Mfrs. bodies.

Dieter Steam Engine Works.—123 Liberty St., New York City. Mfrs. steam engines, boiler feed pumps. Est. 1904.

Dietrich, L. M.—Gen. Mgr. and Designer, Kansas City Motor Car Co., Sheffield, Mo.

Dietrich, O. H.—24 N. 10th St., Allentown, Pa. (Buick, Thomas Flyer, Franklin, Cadillac.)

Dietrich, Société Lorraine des Anciens Établissements de.—Luneville, France. Mfrs. gasoline commercial automobiles (Dietrich trucks and omnibus), gasoline automobiles (Lorraine-Dietrich cars).

Dietz, C. E.—Sec. Moline Pump Co., Moline, Ill.

Dietz Co., R. E.—60 Laight St., New York City. Mfrs. acetylene generators, oil and acetylene lamps.

Diezemann, Gustav.—Supt. Diezemann Shock Absorber Co., 1311-1313 Hudson St., Hoboken, N. J.

Diezemann Shock Absorber Co.—1311-1313 Hudson St., Hoboken, N. J. Mfrs. shock absorbers. Mem. M. & A. M. Cap. \$200,000. Est. 1905. Sam Fisher, Pres.; Henry Fisher, Vice-Pres. and Mgr.; Carl Bomeisler, Sec. and Treas.; Gustav Diezemann, Supt.

Differential Gear.—See Gear, Differential.

Differential Pinion.—See Pinion, Differential.

Dill, James Brooks.—Lawyer. B. Spencerport, N. Y., July 25, 1854. Ed. Yale, 1876 (Law School), Univ. of New York, 1878. Mem. New Jersey Bar. Has been connected with the organization and management of important corporations as director or counsel. Author of several books. Was one of the early members of the A. C. A. and is an automobilist of note. In July, 1905, he was appointed one of the judges of Court of Errors and Appeals of the State of New Jersey. Res., East Orange, N. J. Office, 27 Pine St., New York City.

Dingfelder Motor Co.—Detroit, Mich. Mfrs. gasoline marine motors.

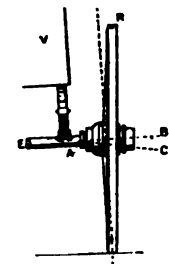
Dingle, S. K.—Pres. Concord Motor Car Co., 64 Huntington Ave., Boston, Mass.

Dinin, A.—2 quai National, Puteaux, France. Mfrs. storage batteries, primary batteries.

Dinner Co., Isaac H.—78 Bedford St., Boston, Mass. Mfr. wearing apparel (caps).

Dinsmore, B. B.—Prop. with Frederic A. Duggan, Imperial Porcelain Works, Mulberry St. and New York Ave., Trenton, N. J.

Dip.—The inclination given to the axles, E (see figure), of a vehicle in order that the spoke of the wheel, R, may be constantly at right angles with the ground. If a person stands in the rear of a vehicle (especially a horse-drawn one) he will observe that not only has the wheel a "dish" (see Dish), but also that its upper part is more distant from the vehicle body, V, than the lower. This is

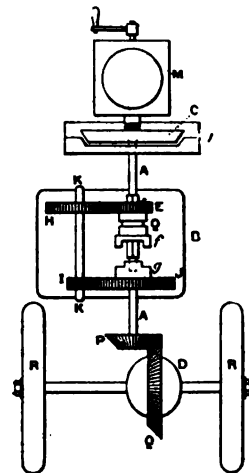


due to the "dip" that the coachmaker is obliged to give the axle spindles for the reason that, in order that the wheels shall have adequate strength, it is necessary that the spokes shall always work at right angles with the surface of revolution.

Direct Current.—See Current, Direct.

Direct Drive.—A system for transmit-

ting movement directly without the use of other intermediate parts. In an automobile, as the motor always revolves more rapidly than the wheels and is never in any case directly coupled with them, it is said that there is a direct engagement when there is but a single reduction of speed between the motor and the differential shaft, whether the latter carries the wheels or the chain pinions.



in mesh at this moment is very small the mechanical noise of the car is very slight.

The accompanying figure gives a diagram of a direct drive of the Renault type. Here A A is the primary shaft; B, the speed-case; C, the cone-clutch; D, the differential; E, H, I, J, wheels giving the low speed; E Q F, the sliding gear; f, the jaw clutch of the sliding gear; j, the female part of the clutch connected to the gear J; K K, the secondary shaft; M, the motor; P, the bevel-pinion; Q, the bevel-wheel; R R, the driving wheels; and V, the fly-wheel.

Direct Process.—The production of wrought iron from the ore without the usual intermediate stage in which cast iron is produced.

Direct Drive Axle Co.—575 N. 4th St., Columbus, O. Mfrs. Pleukharp transmission axles. Mem. M. & A. M. Cap. \$150,000. Est. May, 1906. W. E. Campbell, Pres.; R. V. Barto, Vice-Pres. and Gen. Mgr.; C. T. Phillips, Sec.; F. O. Schoedinger, Treas.; I. H. Pleukharp, Chief Engineer.

Disbrow Bros.—Hillside Ave. and Hoffman Blvd., Jamaica, N. Y. (Rainier, Ford, White). Est. since 1901. Not incorporated. Officers, J. P. Disbrow; L. A. Disbrow, D. A. Disbrow; Sales Mgr., L. A. Disbrow; Head Repairing Dept., J. P. Disbrow; Head of Storage and Tire Dept., D. A. Disbrow. Garage, 70 cars. Repairing.

Disbrow, D. A.—Head Storage and Tire Dept., Disbrow Bros., Hillside Ave. and Hoffman Blvd., Jamaica, N. Y.

Disbrow, J. P.—Head Repair Dept., Disbrow Bros., Hillside Ave. and Hoffman Blvd., Jamaica, N. Y.

Disbrow, L. A.—Head Sales Dept., Disbrow Bros., Hillside Ave. and Hoffman Blvd., Jamaica, N. Y.

Discharge.—The rate of flow of a liquid, that is to say, the amount passing in a given unit of time.

Discharge-box.—The same as muffler. q. v.

Discharge, Electric.—In general, the flow of electricity from a conductor, charged at a certain potential, toward a conductor charged at a less potential.

Discharging.—The process of taking current from an electric cell or battery.

Disengaging Gear.—See Gear, Disengaging.

Dish.—An inclination given to the spokes of a wheel from the exterior plane of the rim to the center point of the axle spindle, so as to make the wheel a kind of flattened cone; greater stiffness being gained by such an arrangement. The dish of the wheels is usually balanced by slightly inclining the axle-spindle from its center line, thus bringing the lowest spoke to a nearly vertical position with relation to the ground.

A dished steering-wheel is one in which the rim is above the boss, so that the arms incline upwards toward the rim.

A hole in a board is said to be dished when the edge is bevelled.

Dish-pan Clutch.—See Clutch.

Disk.—A flat circular plate of any material.

Disk, Armature.—See Armature.

Disk, Brake.—See Brake, Disk.

Disk-clutch.—See Clutch, Disk.

Disk-crank.—See Crank, Disk.

Disk, Piston.—See Piston, Disk.

Disk, Valve.—The flattish head of an inlet or exhaust-valve.

Disk-wheel.—See Wheel, Disk.

Disnay, L. M.—Gen Mgr. Dolson Automobile Co., Charlotte, Mich.

Displacement.—The weight of water displaced by a body, such as a boat floating in it, such weight being equal to that of the body. With a motor-boat, one ton displacement is equal to 35 cubic feet displacement; and one cubic foot displacement equals 0.02857 ton displacement. (2) The space swept by the cylinder of a motor at each piston-stroke. It equals the area of the piston multiplied by the length of the stroke. (3) A supposed slight motion of electricity in a dielectric acted on by an e. m. f.

Distance-rod.—A rod or link, called also a "radius-rod," for keeping the same relative distance (often regulated by a

turn-buckle) between two machine elements. (2) Same as drag-link. See Link, Drag.

Distance-washer.—A piece of sheet metal placed between two portions of a mechanism to keep them a certain distance apart. See Shim.

Distributor.—A device for switching the current of an electric ignition system to the different cylinders of a multi-cylinder motor in proper sequence.

A distributor carries both primary and secondary current, whereas a timer carries only primary current. The two words are frequently confused, both being used in the sense of "timer."

In the construction of distributors, the currents of different tension (primary and secondary) must be carefully isolated. In this country, the distributor is not much employed, the timer with a coil



for each cylinder being used, thus dispensing with the distributor and its short-circuiting tendencies. The advantages of the use of a distributor lie in having but one or two coils and less wire in use. Its disadvantages are the liability to short-circuit and the inaccessibility of the second circuit (being usually placed behind the primary in the construction). The rotating parts are usually of brass, fixed to the axle and passing over brass segments, each being fitted into the casing and connected by proper wiring. Fiber or hard-rubber lines the casing, and the latter is revolvable through a large arc for varying the time of ignition, exactly like a timer.

Dittman, Christian.—Main St. and Broadway, Amityville, N. Y. (Maxwell, Cadillac.)

Dittman und Neuhaus.—Witten, Germany. Mfrs. springs.

Ditzler Paint & Color Works.—14 Baltimore Ave. W., Detroit, Mich. Mfrs. paints, varnishes.

Dividers.—Compasses used solely for measuring off distances.

Dixon Crucible Co., Jos.—Jersey City, N. J. Mfrs. brazing compound; crank shafts; graphite; grease; oils.

Doan, E. D.—926 Janis Ave., Saginaw, Mich. (Reo, Cartercar.)

Dobrick, Aug.—Supt. The Turner Brass Works, Sycamore and Illinois Sts., Chicago, Ill.

Doddridge, P. B.—Sec., Treas. and Head of Dept. Missouri Valley Auto Co., 1112-1114 E. 15th St., Kansas City, Mo.

Doddridge, W. H.—Supt. Hatcher Auto Parts Co., 2108 Superior Ave. Viaduct, Cleveland, O.

Doddridge, W. B.—Pres. Missouri Valley Auto Co., 1112-1114 E. 15th St., Kansas City, Mo.

Dodge Lubricator Co.—8 Waltham St., Boston, Mass. Mfrs. lubricators, timers.

Dodge Motor Vehicle Co.—223 Columbus Ave., Boston, Mass. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

Dodge, Henry Irving.—Writer on motor-boat and yachting topics, and associate editor Yachting. B. Kasoag, Oswego County, N. Y., April 11, 1861. Ed. common school. Address, 20 Vesey St., New York City.

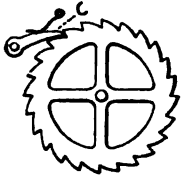
Dodge, John E.—Vice-Pres. Ford Motor Co., Detroit, Mich.

Dodge, M. M.—Valparaiso, Ind. (Maxwell.)

Dodson, E.—West Liberty, O. (Winton.)

Dog.—A clamping device for a lathe, for firmly holding pieces of metal or wood to be machined, and which are driven by the rotation of a face-plate on which the dog is mounted. (2) A construction of similar form which supports the bushings of a die.

(3) A cramp consisting of a curved casting and a set-screw used on motors to keep the exhaust valves in place, and for holding together the pump in some machines. See Bridge. (4) A click or pawl C (see figure) designed to engage the teeth of a ratchet-wheel. See Click, Pawl and Ratchet.



Dog-clutch.—See Clutch.

Doherty, H. B.—24 Wall St., Binghamton, N. Y. (Cadillac, Franklin, Darracq, American Mercedes.) Est. 1904. H. B. Doherty, Prop.

Dohn, A. F.—Vice-Pres. Buffalo, Gasoline Motor Co.—1280-1290 Niagara St., Buffalo, N. Y.

Dolson Auto Co.—406 McKay Bldg., Portland, Ore. (Dolson.)

Dolson Automobile Co.—Charlotte, Mich. Makers of the Dolson car, first marketed in 1901. Three models made since. Cap. \$300,000. J. L. Dolson, Pres. and Treas.; D. E. Dolson, Sec., Designer and Purch. Agt.; L. M. Dismey, Sales Mgr. Agents and dealers: Auto Maintenance Co., 1239 Fulton St., Brooklyn, N. Y. Childs, Walter H., McKeesport, Pa. Continental Auto Co., 93 Jefferson Ave., Grand Rapids, Mich. Craig, Frank S., 521 Chestnut St., Long Beach, Cal. Dickinson, G. B., Niantic, Conn. Dolson Auto Co., 406 McKay Bldg., Portland, Ore. Eureka Motor Car Co., Seattle, Wash. Ford, H. N., Jamestown, N. Y. Fulper, Wm. H., Flemington, N. J. Hornburge Auto Co., C. H., 214 Post St., Spokane, Wash. Howard Dana, Cobleskill, N. Y. Jungclas Auto Co.,

Reading Rd. and June St., Cincinnati, O. Little Rock Auto Co., 118 E. Markham St., Little Rock, Ark. Livesey-Pionnie Co., 136 S. 11th St., Newark, N. Y. Moore, J. C., 809 Euclid Ave., Cleveland, O. O'Brien, Edw., 22 Wood Ave., Providence, R. I. Phila. Auto Sales Co., 332 Broad St., Philadelphia, Pa. Plank, A. E., Quincy, Ill. Puritan Motor Co., 43 Columbus Ave., Boston, Mass. W. F. Rabenold, Allentown, Pa. Reid, S. D., Euclid Garage, Cleveland, O. Rued, F. S., Akron, O. San Francisco Motor Car Co., Berkeley, Cal. Stewart & Kennedy, 5208 Lake Ave., Chicago, Ill. Tarrant, W. P., 12 Maple Ave., Saratoga, N. Y. Van Alstyne, T. B., 25 W. 42nd St., New York City. Warren Bros., 935 Fulton Bldg., Pittsburg, Pa. Zimbrich, A. M., 45-49 South Ave., Rochester, N. Y.

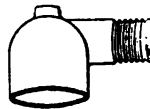
Dolson Automobile Co.—25 W. 42nd St., New York City. (Dolson.)

Dolson, D. E.—Sec., Designer and Pur. Agt. Dolson Automobile Co., Charlotte, Mich.

Dolson, J. L.—Pres. and Treas. Dolson Automobile Co., Charlotte, Mich.

Doman Co., H. C.—Oshkosh, Wis. Mfrs. gasoline marine motors, motor-boats.

Dome.—A term sometimes used to designate the part that covers an inlet-valve, and a bolt passing through the top of which holds the elbow of the inlet-pipe down on the valve.



Domecq-Cazau et Cie.—75 ave de Wagram, Paris, France. Mfrs. tire pumps.

Domestic Sewing Machine Co.—Warren and High Sts., Newark, N. J. Mfrs. gray iron castings.

Dominick, Wm.—542 Wabash Ave., Chicago, Ill. Repairing.

Dominion Auto Co.—Bay and Temperance Sts., Toronto, Canada. (Packard, Thomas Flyer, Stevens-Duryea, Winton, Ford, Russell.)

Dominion Auto Co.—310 Donald St., Winnipeg, Canada. (Winton, Russell, Ford.)

Dominion Automobile Co.—London, Ont., Canada. Garage.

Dominion Motor Car Co., Ltd.—11 Beaver Hall Hill, Montreal, Canada. Supplies, garage, repairing.

Donahoo-Emmons & Co.—1114 First St., Fresno, Cal. (Indian.)

Donahue, Geo. J.—389 Warren Ave., Brockton, Mass. (Rambler, Pope-Waverley, National, Reo, White.)

Donald, Francis C.—Commissioner Central Passenger Ass'n. B. Canfield, O., July 5, 1857. Ed. high school. Pres. and Director American Railway Guide Co., Central Railway Distributing Co.,

Director Chicago Motor Club, Chicago Railway Distributing Co. Mem. Union



League Club, Chicago Yacht Club, Midlothian Club, Chicago Motor Club, A. A. A. Address, Tribune Bldg., Chicago, Ill. Owned first car 1900 (steam and gasoline). One of three to organize Chicago A. C. Called meeting resulting in organization of

A. A. A. Designed and built, in 1902, a practicable three-cylinder gasoline car.

Donaldson Hardware Co.—Beaver, Pa. (Winton.)

Donaldson, R. G.—Sec. Pope Automobile Co. of Washington. 817-819 14th St., N. W., Washington, D. C.

Doninelli, Victor.—15 ave. de la Gere, Nice, France. Mfrs. goggles.

Donley & Dugan.—Morgantown, W. Va. (Cadillac)

Donnelly, John J.—Doyleston, Pa. Garage.

Donovan, C. J.—Hd. of Trimming Dept. Fickling & Co., Inc., 154 E. 57th St., New York City.

Dooley, E. H.—Hd. of Repair Dept. Bird-Sykes Co., 1470 Michigan Ave., Chicago, Ill.

Dooley Smith & Co.—San Juan, Porto Rico. (Reo)

Dop.—16 rue du Débarcadère, Paris, France. Mfrs. automobile motors.

Dope.—A thick axle-grease.

Dora, Societa Industriale Italiana.—Genoa, Italy. Mfrs. storage batteries.

Doran, H. W.—Dover, N. H. (Ramblor.)

Dorflingeresche Achsen und Federn-fabrik Actiengesellschaft.—Mannheim, Germany. Mfrs. springs.

Dorland, W. G.—Aurora, Neb. (Pope.)

Dorman, A. D.—Sec. General Mfg Co., Elkhart, Ind.

Dorman, F. D.—Sec. Maxwell-Briscoe Motor Co., Tarrytown, N. Y.

Dorn, F. Philip.—Sec. American Ball Bearing Co., Edgewater Park and L. S. and M. S. Ry., Cleveland, O.

Dorn, Frederick C.—Treas. American Ball Bearing Co., Edgewater Park and L. S. and M. S. Ry., Cleveland, O.

Dorris Co. of New Jersey.—21 Clinton St., Newark, N. J. (Dorris.)

Dorris, D. R.—Sec., Treas. and Sales Mgr. Nashville Motor Car Co., Church and 9th Sts., Nashville, Tenn

Dorris, Duncan A.—155 Spruce St., Nashville, Tenn. Garage.

Dorris, G. P.—Designer. Supt. and Vice-Pres. Dorris Motor Car Co., 22-38 S. Sarah St., St. Louis, Mo.

Dorris Motor Car Co.—22-38 S. Sarah St., St. Louis, Mo. Maker of the Dorris car, first marketed Dec. 1, 1906. Two models made since. Cap. \$55,000. H. B. Krenning, Pres.; Gen. Mgr. and Purch. Agt.; G. P. Dorris, Vice-Pres., Designer and Supt.; Webb. Colbun, Sec.; John T. Rumble, Sales Mgr. Agents and dealers: H. H. Holland, Fresno, Cal. Capt. C. A. Lundy, 320 S. Virginia St. Reno, Nev. Nashville Motor Car Co., Nashville, Tenn. South Broad Auto Co., 729 S. Broad St., Philadelphia, Pa. A. C. Stewart, 10th and Santee Sts., Los Angeles, Cal. Webb, Taylor & Perry, Austin, Tex. Geo. L. Clayton, Oakland, Cal.

Dorris Motor Car Co.—729 S. Broad St., Philadelphia, Pa. (Dorris.)

Dorsch, H. S.—1030 Albany St., Schenectady, N. Y. Garage.

Dorset Co., L. P.—17th and U Sts., N. W., Washington, D. C. (Glide.)

Dorsey, A. H.—Vice-Pres. and Gen. Mgr. United Motor Car Co., Philadelphia, Pa.

Dos-a-dos.—In a motor vehicle an arrangement of seats back to back.

Dosson Carriage Co.—909 Jefferson Ave., Toledo, O. (Holsman.)

Doty, A. J.—Supt. Commercial Truck Co. of America, 1222 Arcade, Philadelphia, Pa.

Doty, Ed.—Andalusia, Ala. (Waltham.)

Double-acting Engine.—See Engine, Double-acting.

Double-acting Pump.—See Pump, Double-acting.

Double-chain Drive.—A transmission system in which the motor drives, through a clutch, to a change-speed gear, thence by bevel-gear to a jack-shaft, and finally to the rear wheels by two side-chains.

Doubleday Co., W. A.—340 S. Warren St., Syracuse, N. Y. Garage.

Double-Friction Coil Clutch Co.—45 Canal St., Chicago, Ill. Mfrs. clutches.

Dougherty & Colt Mfg. Co.—105 W. Bridge St., Columbus, O. Mfrs. miscellaneous wearing apparel

Douglas & Lomason Co.—302-310 Grand River Ave., Detroit, Mich. Mfrs. brass handles, brackets, rails, hinges, catches, turnings, monitor lathe work of all kinds, stamping and punching. Cap. \$50,000. Est 1902. A. G. Douglas, Pres.; A. J. Cloutier, Vice-Pres.; H. A. Lomason, Sec. and Treas.

Douglas, A. G.—Pres. Douglas & Lomason Co., 302-310 Grand River Ave., Detroit, Mich.

Dounds, J. W.—Barnesville, O. (Mitchell.)

Dover Co., Geo. W.—80 Clifford St., Providence, R. I. Mfrs. screw machine products.

Dover Garage Company.—74 E. Blackwell St., Dover, N. J. (Rambler, Jackson, Rapid, Holsman.) Est. December, 1904. Cap. \$10,000. R. A. Bennett, Pres.; Chas. S. Clark, Sec. and Treas.; R. A. Bennett, Mgr. Garage, 30 cars. Repairing.

Dover Stamping & Mfg. Co.—385 Putnam Ave., Cambridge, Mass. Mfrs. waste cans, dashes and fenders, drip pans, gasoline funnels, hoods, oil cans.

Dover, O. T.—Vice-Pres. Albaugh Bros., Dover & Co., Marshall Blvd. and 21st St., Chicago, Ill.

Dovetail.—See Joint. Dovetail.

Dow & Whitman.—113-115 Golden Gate Ave., San Francisco, Cal. (Rambler.) Est. Aug. 1, 1906. Garage, 70 cars. Repairing.

Dow, Alexander.—Pres. Dow Tire Co., 104 W. 42nd St., New York City.

Dow, Alva M.—Pres. Dow Portable Electric Co., Adams St., Braintree, Mass.

Dow Portable Electric Co.—Adams St., Braintree, Mass. Mfrs. spark coils. Est. in 1893. Inc. in 1896. Cap. \$100,000. Alva M. Dow, Pres.; Willard E. Dow, Treas. and Gen. Mgr. Garage, 40 cars. Repairing.

Dow Tire Company.—Office, 104 W. 42d St., New York City. Factory foot 39th St., S. Brooklyn, N. Y. Mfrs. non-deflating tubes. Cap. \$1,500,000. Est. 1906. Alexander Dow, Pres.; Harry D. Gue, Vice-Pres.; A. V. R. Barnewall, 2d Vice-Pres.; Sidney R. Perry, Sec. and Treas.

Dow, Willard E.—Treas. and Mgr. Dow Portable Electric Co., Adams St., Braintree, Mass.

Dowagiac Mfg. Co.—Dowagiac, Mich. (Maxwell, Mitchell.)

Dowel.—A pin used to connect adjacent pieces, and penetrating for part of its length into each piece at right angles with the plane of junction.

Dowling's Garage.—26-30 Forest Ave., Portland, Me. (Thomas Flyer, Royal.) Supplies; garage; repairs.

Downey & Bingham.—159 Jay St., Albany, N. Y. Garage.

Downey, H. T.—Calgary, Alta, Canada. (Maxwell.)

Downing, Chas. J.—54 Warren St., New York City. Selling agents and importers. Lamp burners, gas pliers, wire cutters and pinchers, battery connectors, tires, horns.

Downing Grease Co.—14 Waltham St., Boston, Mass. Mfrs. grease.

Downington Garage & Repair Co., Inc.—E. Lancaster Ave., East Downington, Pa. (Waltham.)

Downs, Merle Leach.—Sec'y National



Automobile Shows, Madison Square Garden. B. Downs-ville, Delaware Co., N. Y., July 17, 1875. Ed. Owego Free Academy, 1893, Sibley College, Cornell University 1897. Res. 559 Sanford Ave., Flushing, L. I. Office, 7 E. 42nd St., New York. In the trade Novem-

ber, 1899. Recreations, automobiling, tennis, photography.

Doxsee, A. S.—1414 Chestnut St., St. Louis, Mo. (Aerocar.)

Doyle Hose Union Co.—810 Ann St., Homestead, Pa. Mfrs. hose couplings.

Doyleston Auto & Motor Cycle Repair Shop.—18 Donaldson St., Doyleston, Pa. (Cadillac, Pierce-Arrow.)

Draft.—The depth of water which a boat displaces, or of a body of fluid necessary to float a vessel.

Drag.—The bottom flask of a mould. (2) The mechanical force experienced by a conductor in which the current is flowing, when moved so as to cut the lines of force. Such drag is at right angles to the conductor and tangential to the armature, and tends to rip the winding off the surface of the core.

Drag-link.—See Link, Drag.

Drag-surface.—The surface of the blade of a screw propeller, which is next to the vessel.

Dragon Agency.—North Ave. and Charles St., Baltimore, Md. (Dragon.)

Dragon Auto Co.—1337 Michigan Ave., Chicago, Ill. (Dragon.)

Dragon Auto Garage of Hudson Co.—1318 Park Ave., Hoboken, N. J. (Dragon.)

Dragon Automobile Agency.—37 Wybosset St., Providence, R. I. (Dragon.)

Dragon Automobile Co.—Kittery, Me. Garage.

Dragon Automobile Co.—524 Golden Gate Ave., San Francisco, Cal. (Dragon.)

Dragon Motor Car Co.—620 Maryland Ave., Pittsburg, Pa. (Dragon.)

Dragon Motor Car Co.—130 E. 9th St., Los Angeles, Cal. (Dragon.)

Dragon Motor Co.—117 Massachusetts Ave., Boston, Mass. (Dragon.)

Dragon Motor Co.—Successor to Dragon Automobile Co., 31st, 32d and Chestnut Sts., Philadelphia, Pa. Makers of the Dragon car; first marketed Feb. 16, 1906. Three models made since. Cap., \$1,000,000, divided into \$500,000 7 per cent. preferred and \$500,000 common. Officers: J. Edward Calhoun, Pres.; R. G. Kelsey,

Sec. and Treas. Directors: J. E. Calhoun, J. H. Gray, D. E. Crockett, C. A. Pickard, H. Rawle, A. L. Kull, R. G. Kelsey, L. C. Kenan, Designer; R. G. Kelsey, Gen. Mgr.; H. Rawle, Asst. Mgr.; J. H. O'Brien, Supt. and Purch. Agt.; A. L. Hall, Asst. Purch. Agt.; A. L. Kull, Sales Mgr.; John W. Haynes, Asst. Sales Mgr.; Hugh Henry, Cashier and Asst. Treas.; M. L. Myers, Asst. Cashier. Branches in New York City, Boston and Philadelphia, Pa. Agents and dealers: American Garage Company, 5123 Delmar Ave., St. Louis, Mo. Auto Exchange, 501 Broadway, Milwaukee, Wis. Babcock Hardware Co., A. L., Billings, Mont. Bishop, McCormick & Bishop, 28 Halsey St., Brooklyn, N. Y. Blenner, B. A., 508 W. Broad St., Richmond, Va. Bransetter Motor Co., 1337 Michigan Ave., Chicago, Ill. Camden Auto Exchange, 58-60 N. 2nd St., Camden, N. J. Carrington Auto Co., Carrington, N. Dak. Crescent City Auto Co.—217 S. Rampart St., New Orleans, La. Cronin Auto Co., 567 S. Clinton St., Syracuse, N. Y. D'Arcy Scott & Co., 524 Golden Gate Ave., San Francisco, Cal. Dragon Agency, North Ave. and Charles St., Baltimore, Md. Dragon Auto Garage of Hudson County, 1318 Park Ave., Hoboken, N. J. Dragon Automobile Co., 117 Massachusetts Ave., Boston, Mass. Dragon Car Co., 620 Maryland Ave., Pittsburg, Pa. Dragon Motor Car Co., 130 E. 9th St., Los Angeles, Cal. Ebby Mfg. Co., Lincoln, Neb. Erickson, Louis, 1520 Belmont Ave., Seattle, Wash. Franklin, Wm. H., Hightstown, N. J. Hammerstrom, care of Trenton Rubber Mfg. Co., Trenton, N. J. Gates City Motor Car Co., 708 Empire Bldg., Atlanta, Ga. Indianapolis Motor Car Co., 117 Kentucky Ave., Indianapolis, Ind. International Auto Co., 101 Burnside Pl., Montreal, Can. International Auto Co., 16 Temperance St., Toronto, Can. Jungclas Auto Co., Reading Rd. and June St., Cincinnati, O. Kull, A. L., Automobile Co., 1677 Broadway, New York City. Lyndon, A. S., Ann Arbor, Mich. Mohler & DeGress, La Independencia 12, Mexico City, Mex. Motor Livery Co., 249 3rd Ave., S. Minneapolis, Minn. Mulcahy, Dr. L. L., Batavia, N. Y. Neil House Garage, The, 34 W. Capitol St., Columbus, O. O. K. Machine Works, 887 Main St., Stroudsburg, Pa. Rabe-nold, W. F., 28 N. 11th St., Allentown, Pa. Swezy, G. L., Middletown, N. Y. United Motor Car Co., 620 Orange St., Newark, N. J.

Drain-cock.—See Cock, Drain.

Drake & Sons, Harry R.—122 East Union St., Newark, N. Y. (Reo.) Est. 1905. Not Incorporated. Garage, 15 to 20 cars. Repairing.

Drake Auto Station.—Suffolk, Va. (Cadillac.)

Drake, E. J.—Norfolk, Va. (Elmore, Cadillac.)

Drake, Francis E.—Cleveland, O. (Napier.)

Drake, Irving L.—Pres. Orient Mfg. Co., 537 Albany St., Boston, Mass.

Drake, Wilton E.—Treas. and Sec. Orient Mfg. Co., 537 Albany St., Boston, Mass.

Draper Bros. Co.—Canton, Mass. Mfrs. waterproof automobile robes. Cap. \$200,000. Est. 1889. Thomas B. Draper, Pres.; Wm. J. Williams, Vice-Pres.; Walter S. Draper, Treas.

Draper Co., Walter H.—120-126 South Railroad Ave., Mount Vernon, N. Y. Mfrs. lubricants, greases and oils. Cap. \$10,000. Est. 1904. W. H. Draper, Pres.; H. N. Draper, Treas.; Lena Strass, Sec.

Draper Garage, The.—Main St., Northampton, Mass. Garage.

Draper, H. N.—Treas. Walter H. Draper Co., 120-126 S. Railroad Ave., Mount Vernon, N. Y.

Draper, Jesse Sargeant.—Gen. Sales Mgr. Mora Motor Car Co., Newark, N. Y. B. Meadville, Pa., Oct. 6, 1872. Ed. Toledo, O. Mem. Cleveland Auto Club, N. Y. Motor Club, Question Club. Res., 94 Mott Ave., Detroit, Mich. In trade since 1890. Recreations, hunting, fishing.

Draper, Thomas B.—Pres. Draper Bros. Co., Canton, Mass.

Draper, Walter H.—Pres. Walter H. Draper Co., 120-126 S. Railroad Ave., Mount Vernon, N. Y.

Draper, Walter S.—Treas. Draper Bros. Co., Canton, Mass.

Dratz.—21 rue de l'Hospital, Brussels, Belgium. Mfrs. goggles.

Draw.—In pattern-making the taper given to a flange in order to enable it to be drawn from the sand.

Draw-plate.—A perforated hardened steel plate through which wire is drawn.

Drawsbaugh, W. N.—39 Dickinson Ave., Carlisle, Pa. (Winton, Cadillac, Pope-Waverley.)

Draz, Theodore.—Treas. Automobile Topics. B. Brooklyn, N. Y., June 22, 1847. Ed. commercial schooling in Nuremberg, Germany. Director Automobile Topics. Mem. Liederkranz Club. Res., 148 Claremont Ave., Mount Vernon, N. Y. Office, 402 Times Building, New York.

Dresse et Cie., J.—99 rue de la Republique, St. Mandé, Seine, France. Mfrs. differential gears, transmission gears.

Dressler, W.—Annenstrasse 14, Berlin, Germany. Mfrs. marine motors.

Dresser, S. R.—Bradford, Pa. Garage.

Dressler & Co., Chas. E.—143-47 E. 23rd St., New York City. Mfrs. models,

patterns, repair work of every description, timers.

Drevdal et Cie., Binoche.—30 rue Amelot, Paris, France. Mfrs. make and break plugs, spark plugs.

Dreves, R. A.—Office Mgr. Palmer & Singer Mfg. Co., 1620-24 Broadway, New York City.

Drewitz & Son, A.—White Plains Road and 225th St., New York City. Garage.

Driesmere, Jacob.—Sandwich, Ill. (National.)

Drift.—A tool for giving a final form to drilled or punched holes into which it is driven by a hammer.

Drill.—A tool for piercing small holes in wood or metal, by means of a "bit" driven by an alternating rotary motion. For holes of more than $\frac{1}{8}$ -inch diameter this tool is too weak, and a brace is therefore used. See Brace.

Drilling.—The act of boring or piercing a hole by means of a "drill" (q. v.), driven either by a brace or a drill-press.

Drill, Pin.—A drill or bit for making countersinks for the heads of screw bolts.

Drill, Twist.—A drill having a cylindrical body or shaft with two or more



grooves or helical or screw-shape running around it.

Driscoll, M. A.—Washington St. and Broadway, Long Branch, N. J. (Smith.)

Driscoll, Martin A.—Haverstraw, N. Y. (Smith.)

Drisko, Rossell.—Gen. Mgr., Pur. Agt., Sales and Advt. Mgr. Bay State Auto Co., 112 Norway St., Boston, Mass.

Driver.—Of two wheels in gear, the one that communicates motion to the other, called the "follower."

Driver, Walter.—700 W. Lehigh Ave., Philadelphia, Pa. Mfr. motorcycles.

Driving-axle.—A live axle on which the driving-wheels of a motor-vehicle are mounted or by which such wheels are driven.

Driving-belt.—See Belt.

Driving-chain.—See Chain, Driving.

Driving-gear.—The gearing through which the power is transmitted from one part of a machine to another, for example, from the motor of a car to the driving-axle.

Driving-horns.—Projections which overcome the drag on armature conductors and cause them to rotate with the shaft and core of the armature.

Driving-lever.—See Lever, Driving.

Driving-shaft.—The same as propeller shaft. See Shaft, Propeller.

Driving-side.—The tight side of a belt, that is to say, the side that is in tension, and therefore transmits the power. See Idle-side.

Driving-wheel.—See Wheel, Driving.

Drop-brake.—See Sprag.

Drop-forging.—See Forging, Drop.

Drop-oiler.—A lubricator in which the oil is fed drop by drop. See Lubricator, Sight-feed.

Drop-valve.—See Valve, Drop.

Dropped.—Having a downward curvature in the center; as a "dropped axle," "dropped frame."

Dross.—The impurities which collect on the surface of molten metal. See Sullage.

Drouillard, J. P.—Treas. Miami Cycle & Mfg. Co., Grand Ave., Middletown, O.

Drude, C. H.—Vice-Pres. and Mgr. of Engraving Dept. The Chandler Co., 31 Taylor St., Springfield, Mass.

Drumb, W. A.—Grand Rapids, Wis. (Waltham.)

Drum.—The large pulleys of steel in which or on which the brake-bands or segments act in order to stop or diminish the speed of the shaft that carries them. Some manufacturers, in order to prevent the drum from heating, provide a cooling system, consisting of a fall of water, drop by drop, or a circulation of water in the interior.

Drum-armature.—See Armature.

Drum-brake.—See Brake, Drum.

Drum, Mud.—A receptacle on a steam boiler for collecting the sediment deposited by the water.

Druen, B. D.—71 Hamilton St., New Haven, Conn. Mfr. top fixtures.

Drumbor, Chas. E.—6 W. 3d St., S. Bethlehem, Pa. (Ford.)

Dry Battery.—See Coil, Primary.

Dry Steam.—See Steam, Dry.

Dryden, Geo. B.—Mgr. Dryden Rubber Tire Co., 447 Wabash Ave., Chicago, Ill. repairs.

Dryden Rubber Tire Co.—449 Wabash Ave., Chicago, Ill. Vulcanizing and tire

Duane & Co., W. J.—304 W. 54th St., New York City. Mfrs. automobile tops, slip covers, baggage racks, wind shields, all kinds of iron and steel work. Cap. \$5,000. Est. 1903. W. J. Duane, Pres.; F. A. Phillips, Sec. and Treas.

Duane, W. J.—Pres. W. J. Duane & Co., 304 W. 54th St., New York City.

Dubarry, V.—25 rue Soyer, Neuilly-sur-Seine, France. Mfr. wooden wheels.

Dubied et Cie., Edouard.—Couvet, Switzerland. Mfrs. spark plugs.

Dubois Searchlight Co.—220 Broadway, New York City. Mfrs. lamps.

Dubruelle, Louis.—28 bis rue Villeneuve, Clichy-sur-Seine, France. Mfrs. circulating pumps, lubricators.

Duc.—An open single-seated car for two persons, generally carrying a spider seat in the rear for a servant. A "duc" usually has what is called a victoria-phaeton body and is commonly called a

"victoria-phaeton." It ordinarily carries a victoria top.

Ducasse, Jean Elie François.—Gen. Mgr. Lavalette & Co., Pres. and Gen. Mgr. Franco-American Taximeter Co., New York. B. Bordeaux, France, June 2nd, 1862. Res., 13 Lafayette Ave., New Brighton. S. I. Office, 112-114 W. 42nd St., New York.

Ducellier, G.—25 passage Dubail, Paris, France. Mfr. acetylene and oil lamps.

Duck, Frictioned.—Canvas impregnated with a rubber preparation and used in the manufacturing of tire-casings. See Frictioned.

Duck, W. L.—Mgr. London Branch Winton Motor Carriage Co.

Ducker, A. C.—Sumter, S. C. (Holman.)

Ducker Co.—New York City. Mfrs. portable houses.

Duckworth Chain & Mfg. Co.—Springfield, Mass. Mfrs. chains.

Ducomet.—11 rue d'Abbeville, Paris, France. Mfrs. gauges.

Ducommon, H. Emile.—Cleghorn, Ia. (Waltham.)

Ducro Mfg. Co.—1378 Niagara St., Buffalo, N. Y. Mfrs. gasoline and marine motors.

Ductility.—The property possessed by many metals and other substances of being drawn out in length without breaking. When a body can be readily extended in all directions under the hammer it is said to be "malleable," and when into sheets under the rolling press, it is said to be "laminable."

Dudley Auto School Co.—250 Main St., Marlboro, Mass. Garage.

Dudley Mfg. Co., A.—Menominee, Mich. Mfrs. wrenches.

Dudley, Fred. F.—55 Berkeley St., Boston, Mass. Garage.

Dudley, J. Bliss.—Los Angeles, Cal. (Crawford.)

Dudley, S. W.—108 E. Broadway, Butte, Mont. (White.)

Duenas, Jose M.—P. O. Box 344, Havana, Cuba. (Winton.)

Duer, Chas.—Designer and Supt. Chicago Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill.

Duerr & Co., Inc., C. A.—2182-86 Broadway, New York City. Royal Tourist.) Est. 1902. Cap. \$30,000. C. A. Duerr, Pres.; C. H. Hyde, Vice-Pres.; H. B. Phinny, Treas.; S. K. Kellock, Sec. Garage, 150 cars; repairing; supplies; renting and second-hand cars.

Duerr, Charles Alfred.—President C. A. Duerr & Co., Inc. B. Cleveland, O., Jan. 31, 1874. Ed. school and college. Mem. A. C. A., N. Y. Athletic. L. I. A. C., N. Y. Motor, Cleveland A. C. Res. 93rd St. and Riverside Drive, New York. Office, 2182-86 Broadway, New York. In trade Nov., 1901. First car, April.

1899. Formerly engaged in engineering and contracting business. Recreation, automobiling.

Duerr, J. J.—122 Northwest St., Bellevue, O. (Jackson.) Est. 1900. Not incorporated. Garage, 12 cars. Mfrs. motorcycles, motorcycle motors.

Dufaux et Cie, H. et A.—Geneva, Switzerland. Mfrs. motorcycles (La Motosacoche) and motorcycle motors.

Duff & Gregg.—Nebraska City, Neb. (Rapid.)

Duff Mfg. Co.—Pittsburg, Pa. Mfrs. jacks.

Duffield & Funk.—3 Love Lane, Eastheap, London, E., England. Mfrs. tire pumps.

Duffield, H.—Sec. Detroit White Lead Works, 532-60 E. Milwaukee Ave., Detroit, Mich.

Duffield, Maus & Co.—347-49 Wabash Ave., Chicago, Ill. (Logan.)

Duffke, Louis.—Officer and Head of Steel Castings Dept. Nortmann-Duffke Foundry Co., 26th St. and Layton Ave., Milwaukee, Wis.

Car Co., 1871-73 Broadway, New York. Sts., Harrison, N. J.

Dufour jeune et fils.—22 rue de la Cerisaie, Charenton, France. Mfrs. non-skids.

Dufour, Société Anonyme des Camions et Moteurs.—19 rue de la Republique, Marseilles, France. Mfrs. gasoline commercial automobiles (Dufour trucks).

Dugan, G. W.—Shop Supt. Nevada Auto & Supply Co., 115 Ramsey St., Goldfield, Nev.

Dugas.—10 bvd. Sevastopol, Paris, France. Mfrs. wearing apparel, coats.

Duggan, Frederick A.—Prop, with B. B. Dinsmore, Imperial Porcelain Works, Mulberry St. and New York Ave., Trenton, N. J.

Duginer, H.—Treas. Geen Electrical Mfg. Co., 180 Lake St., Chicago, Ill.

Duluth Auto Co.—Duluth, Minn. (White, Maxwell.)

Duluth Automobile Club.—W. W. Walker, Sec., Duluth, Minn.

Duluth Gas Engine Works.—Cor Vine and Minnesota Ave., Duluth, Minn. Mfrs. marine and stationary gasoline motors, reversible feathering, non-feathering propellers. Cap. \$50,000. Est. 1900. A. A. Williams, Pres., Mgr. and Supt.; Axel Zimmerman, Sec.

DuMars, C. O.—Pur. Agt. Banker Bros. Co., Baum and Beatty Sts., Pittsburgh, Pa.

Dumas Auto Exchange.—15 Prospect St., Manchester, N. H. Garage. usually provided with apertures for the attachment of the front ends of the springs. See Spring-iron.

Dunbar & Mansir.—302 High St., Holyoke, Mass. (Elmore.)

Dunbar Bros.—Bristol, Conn. Mfrs. machinery springs.

Dunbar, W.—Gen. Supt. Pennsylvania Rubber Co., Jeannette, Pa.

Duncan, J. H.—Mgr. D. K. Electric Co., 106-10 Locust St., St. Louis, Mo.

Duncan, W. A.—Rolla, N. D. Garage.

Dunham & Son, Inc., D. B.—Rahway, N. J. Mfrs. limousine, landaulet and touring bodies; slip covers; cape, semi-mousine and canopy tops. Cap. \$50,000. Est. 1863.

Dunham, G. J.—182-8 Columbus Ave., Boston, Mass. (Royal.) Est. 1898. Repairing cars represented only.

Dunham, George Willis.—Chief engineer Olds Motor Works. B. Cleveland, O., May 4, 1876. Ed. Kenyon College. Res. 738 Ionia St. West. Office. Olds Motor Works, Lansing, Mich. In trade since 1900.

Dunham, Geo. W.—Designer Olds Motor Works, Lansing, Mich.

Dunham, M. H.—Great Barrington, Mass. Garage.

Dunham, M. H.—Main St., Sheffield, Mass. (Pope-Toledo). Est. 1905. Garage. 20 cars. Repairing; electric charging.

Dunhill, Ltd., Alfred.—Euston Road, London, N. W., England. Wearing apparel, fur coats, hats and caps; goggles.

Dunhoelter et Schoelzel.—148 Faubourg St Denis, Paris, France. Mfrs. speed indicators.

Dunk, Alfred O.—Treas. Designer and Gen. Mgr. Puritan Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

Dunk, Thomas H.—Sec. Puritan Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

Dunlap Motor Car Co.—Canton, O. (Mitchell)

Dunlop Pneumatic Tire Co.—Hanau, Germany. Mfrs. pneumatic rubber tires.

Dunlop Rubber Co., Ltd.—Manor Mills, Birmingham, England. Mfrs. detachable rims.

Dunlop, Société Française des Pneumatiques.—Argenteuil (Seine-et-Oise), France. Mfrs. pneumatic rubber tires.

Dunlop Tyre Co., Ltd.—Aston, Birmingham, England. Mfrs. pneumatic tires.

Dunn, H. T.—Pres. The Fisk Rubber Co., Oak St., Chicopee Falls, Mass.

Dunn, J. E.—Pres. and Mfg. Mgr. The Semi-Dry Battery Co., Fifth and Essex Sts., Harrison, N. J.

Dunn, Walter E.—Ogdensburg, N. Y. Mfrs. gasoline marine motors.

Dunne, D. W.—143 Federal St., Boston, Mass. Supplies.

Dunnett, M. L.—Abilene, Kan. (Walsham.)

Dunton & Co., M. W.—65 Atlantic Ave., Providence, R. I. Mfr. soldering paste, cotton and linen armature tapes and sleeveings; insulating paper.

Duplex Automobile Works.—4212 State St., Chicago, Ill. Mfrs. gasoline automobiles.

Duplex Coil Co.—Fond-du-Lac, Wis. Mfrs. spark coils.

Duplex Folding Pail Co.—420 W. 14th St., New York City. Mfrs. collapsible buckets.

Duplex Ignition Co., Inc.—307 W. 36th St., New York City. Mfrs. spark plugs.

Duplex Roller Bushing Co.—Belfast, Me. Mfrs. motor boats, gasoline engines, tackle blocks and all products of iron, brass and bronze foundries and machine shop. Cap. \$300,000. Est. 1887. Chas. A. Horton, Pres.; H. Holton Wood, Vice-Pres.; E. W. Davenport, Treas.; E. B. Gilchrist, Sec. Boston office, 6 Beacon St.

Dupoirer, H.—48 rue Claude-Decaen, Paris, France. Mfr. clutches.

Dupont, A.—36 quai de Suresnes, Suresnes, France. Mfrs. siren horns.

Dupont Garage Co.—2020 M St. N. W., Washington, D. C. (Columbia, Rambler, Waltham, Cleveland.)

DuPuy, H. W.—Vice-Pres. and Treas. Pennsylvania Rubber Co., Jeannette, Pa.

Duquesne Cycle Co.—Pittsburg, Pa. (Indian)

Duquet, Louis G.—107 W. 36th St., New York City. Est. March 1, 1906. Importer automobile supplies.

Durant, W. C.—Gen. Mgr. Buick Motor Co., Flint, Mich.

Duray, Arthur.—Driver of racing cars. B. at Brussels, Feb. 9, 1882. Began racing in 1898, and participated in all the big events since 1901. His greatest triumph was the winning of the Ardennes Circuit in 1906, in a De Dietrich car, when he covered the 372.7 miles at an average speed of 66.12 miles per hour. Participated in the 1906 Vanderbilt cup race, finishing in third place.



Dumb-iron.—The extreme forward ends of the sills of a motor-car frame

Durbster, Ralph.—Sec. Eclipse Machine Co., Elmira, N. Y.

Dürkopp und Co., Action Gesellschaft.—Bielefeld, Germany. Mfrs. gasoline commercial automobiles, gasoline automobiles (Dürkopp), jacks.

Durin, A. E.—Cedar Rapids, Ia. (American.)

Duro Mfg. Co.—935 S. Los Angeles, Cal. (Durocar.)

Durocar Mfg. Co.—1130 S. Main St.,

Los Angeles, Cal. Mfrs. gasoline automobiles.

Durr, H. H.—Pres. The Victor Rubber Co., Springfield, O.

Durst, J. H.—Sec. Pioneer Auto Co., 901-25 Golden Gate Ave., San Francisco, Cal.

Duryea, Chas. E.—Reading, Pa. Mfr. carburetters.

Duryea, Charles Edgar.—Consulting engineer A. M. C. M. A. and Corbin



Motor Vehicle Corp. B. near Canton. Fulton Co., Ill., Dec. 15, 1861. Ed. District school, Wyoming school, Gitting Seminary, Ill. Mem. American Society of Automobile Engineers. 1st V. P. American Motor League.

Res., Reading, Pa. In trade (automobiles) since 1891, (motorboats) since 1896, (aeronautic motors) since 1903. Author of "Roadside Troubles," test book on "Automobiles" for American School of Correspondence, Armour Institute of Tech. Ed. Gasolene Query Dept. Automobile Trade Journal. Recreations, automobiling, boating, kite-flying, etc.

Duryea, J. Frank.—Vice-Pres. and Factory Mgr. Stevens-Duryea Co. B. Washburn, Woodford Co., Ill., Oct. 8, 1869. Ed. Wyoming (Ill.) High School. Mem. Springfield Automobile Club, Noyasset Club of Springfield. Res., 34 Federal St., Springfield, Mass. In the trade since 1891. User of car to limited extent from 1891-1896, regularly since then. Designed, built and drove the winner of the Times-Herald race at Chicago, Thanksgiving, 1895. Also built and drove winner Cosmopolitan race, New York, 1896.

Dusenbergh, A. S.—Garner, Ia. Mfrs. motorcycles.

Dusenbury, Louis.—86-88 Worth St., New York City. Mfr. automobile robes, cloth and carpet trimmings.

Dussault Auto Works.—63 Buffalo St., Lockport, N. Y. (Cadillac, Winton.)

Dust-apron.—See Apron, Dust.

Dust-pan.—A metal pan placed beneath the power-plant of a motor-car and designed to protect it from mud and dust.

Dutcher, Charles.—Supt. Unique Metal Co., 25 Illinois St., Buffalo, N. Y.

Dutcher Co., J. A. & P. E.—Milwaukee, Wis. Mfrs. steel castings.

Dutemple, A.—33 rue de Seine, Ivry-Port, France. Mfrs. motorcycles.

Dutrix - Lamelin.—Lequesnoy, Nord, France. Mfrs. non-skids, shock-absorbers.

Duttman C.—Amityville, L. I. N. Y. (Maxwell.)

Dutton Co., W. H.—24 Washington St., Morristown, N. J. (Oldsmobile, Royal.)

Dutton Engineering Co.—Perth Amboy, N. J. Mfrs. motorboats.

Dutton, W. H.—Sec., Treas. and Mgr. Tokheim Mfg. Co., 815 N. First St., W., Cedar Rapids, Ia.

Dutton, W. H.—Sec. and Treas. The Van Dorn & Dutton Co., 2714 E. 79th St., Cleveland, O.

Duty.—The old system of measuring the efficiency of an engine. It is the number of foot-pounds of work performed by the combustion of one bushel of coal.

Duval, W. S.—1319 L St., N. W., Washington, D. C. (Pullman Flyer.) Garage.

Duvinaige, Camille.—232 rue de Longues-Haies, Roubaix, France. Mfr. wood rims.

D-valve.—See Valve D.

Dwight, P. D.—Sec. and Treas. C. R. Wilson Body Co., Detroit, Mich.

Dyckmans Garage.—Harper St., Stamford, N. Y. Garage.

Dyde & Richards Auto Supply Co.—1691 Broadway, New York City. Supplies.

Dye, C. T.—Remington, Ind. (Glide.)

Dyer's Auto Depot.—Cor. Pine and Bennett Sts., Manchester, Mass. (Pope line.)

Dyle et Bacalan, Société Anonyme de Travaux.—15 Ave. Matignon, Paris, France. Mfrs. pressed steel frames.

Dynamics.—The theory of forces which are not in equilibrium.

Dynamo.—A mechanical generator of electricity based upon the electro-magnetic induction produced in the field of an electro-magnet. Dynamos furnish an alternating or continuous current. A dynamo gives a direct current when its armature is provided with a commutator, and an alternating current when its armature is fitted with rings connected to the windings. In the first case it is called an "alternating current dynamo" or "alternator," and, in the second, a "continuous current dynamo," or simply "dynamo."

A dynamo comprises two essential parts, viz. (1) an inductor designed to produce the magnetic field in which are developed the phenomena of induction, and (2) an armature consisting of the conductors in which are generated the induced electromotive forces. The inductor is generally stationary and the armature movable.

Of the two forms of mechanical gen-

erators of electricity used for ignition purposes, dynamos and magnetos, the latter, on account of their simplicity of construction and low cost, are more generally employed. See Magneto.

Dynamometer.—An apparatus employed for measuring the force transmitted or produced by a receiving apparatus or a motor.

There are two kinds of dynamometers—"absorption" and "transmission." The first in most cases absorb work by friction. The best known type is the "Prony brake," which is employed for measuring

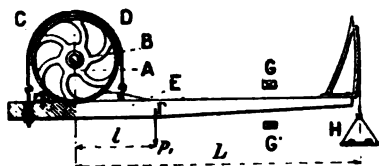


Fig. 1.

the effective power of a motor, that is to say, the power really furnished upon its shaft. It consists of a pulley, A (fig. 1), which is placed on the shaft of the motor the power of which it is desired to measure. The pulley, A, may be the fly-wheel of the motor. Upon this pulley are placed wooden shoes, C, held by an iron-plate strap, D, the extremities of which are connected to a wooden lever by means of hooked rods, a portion of which is threaded. This lever is provided at its upper part with a piece, F, upon which bears the pulley. The free extremity of the lever carries a pan, H, in which weights may be placed, or else the center

itself is provided with a weight that slides along it. The apparatus having been mounted, the motor is set in operation and allowed to attain its normal velocity and the shoes are then pressed against the fly-wheel. At this moment,

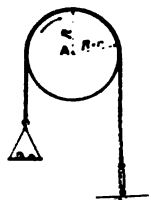


Fig. 2.

the lever-arm, E, has a tendency to be carried along in the direction of the revolution, but, in order to prevent this, two stops are arranged at G and G'. Weights are then placed in the pan, H, in order to keep the lever E horizontal.

The dynamometer measures the force by determining the path traversed by the point of application and the duration of the measurement. The work and power furnished are calculated by the force. Referring to the figure and designating by

F the force of friction of the circumference of the pulley;

R the radius of the pulley;

p the weight placed at H and keeping the lever horizontal for a power, P, produced upon the motor shaft;

p' the tare of the brake, balancing the unweighted lever;

ω the velocity of the shaft B in revolutions per minute

we have for the value of the power, when the beam, E, is horizontal:

$$P' = \frac{(p' + p') L x 2 \pi x \omega}{60} \text{ foot-pounds per sec.}$$

$$P = \frac{(p' + p') L x 2 \pi x \omega}{60 x 75} \text{ horse-power.}$$

The value of p' or "tare" of the brake, will be had by using marked weights for balancing the unweighted lever.

In order to make things plain, suppose that the following results have been found in the experiments:

Tare of the brake (p') 3.85 pounds.

Weight placed in the pan (p) 16 pounds.

Velocity in revolutions per minute (ω) 750.

Length of the lever-arm, 32 inches.

Then the result will be:

$$P = \frac{(p x p') L x 2 \pi x \omega}{60} = 4010 \text{ foot-pounds per second, or } 7.44 \text{ h. p.}$$

In order to obtain a serious result, it is necessary to continue the experiment for at least ten minutes. During such time it always happens that the force of friction diminishes in consequence of the variation in the tightness of the shoes. Now, it is necessary that this force shall remain constant, since, as the apparatus is weighted, the sum of the weights being greater than the force of friction, the lever would no longer be in equilibrium. This drawback is corrected by tightening the nuts. In order to prevent shocks, care is taken to place rubber disks under the washers. The stops G and G' prevent the lever, E, from taking dangerous positions when the equilibrium is broken. The friction of the shoes against the pulley naturally produces a certain amount of heat. As the mechanical work is here converted into heat, care must be taken, in order to prevent gripping, to lubricate the rubbing part with soap-suds.

The "rope brake" (fig. 2) is an absorption dynamometer, the measurements of which are effected by a transmission dynamometer.

If R be the radius of the fly-wheel keyed upon the motor shaft,

r the radius of the rope,

ω the velocity with which the shaft revolves per minute,

p the weight placed at D, sufficiently heavy to prevent it from being thrown off by the revolution of the fly-wheel,

p' the indication of equilibrium of the

transmission dynamometer corresponding to a power P .

$$P = \frac{(p-p')2\pi(R+r)\omega}{60} \text{ foot-pounds per sec.,}$$

and

$$P' = 0.001305(p-p')(R+r)\omega \text{ horse-power.}$$

A generating dynamo of which the efficiency η is known furnishes an excellent absorption dynamometer.

Let U be the difference of potential of the dynamo, and I the intensity of the current produced.

$$\text{Then } P' = \frac{UI}{736 + \eta} \text{ —horse-power.}$$

Transmission dynamometers are interposed, say between a motor and the shaft that it actuates, or between two contiguous pulleys having the same axis and the faces of which are in proximity. Such dynamometers make known, through the flexion of the spring, the intensity of the force that is traversing them. While the former take the place of apparatus actuated by the motor, the latter are capable of operating during the effective running.

These apparatus are graduated in pounds and are employed for measuring stresses of compression or traction, and also for measuring the force necessary to overcome the resistance of the running of a vehicle upon rails or upon roads.

What are called "spring balances" are dynamometers.

Among well-known dynamometers

may be mentioned those of Leroy, Rognier, Watt, Dollfus, Mieg, Hirn, Piguet and Morin. Those of the latter are either "curve-dynamometers," giving the work by plainmetrage, or "counter-dynamometers," giving the work by direct reading. For measuring the force of traction, or motor-couple exerted upon a vehicle there are also employed transmission dynamometers acting by the compression of water measured by a pressure-gauge or a dynamometric pendulum that automatically measures and inscribes the accelerations of vehicles in motion as a consequence of an external traction. From a knowledge of the acceleration is deduced the velocity and the motor stress.

In case of electric traction, an ammeter may be employed as a dynamometer.

From the standpoint of the C. G. S. system, the name dynamometer, that is to say, "measurer of dynes," is correctly applied only to transmission dynamometers, which measure forces, but is erroneously extended to those of absorption, which are rather measurers of power.

Dyne.—The name of the unit of the measurement of "force" in the C. G. S. System.]

It is the force necessary to give a mass of one gramme an acceleration of one centimetre per second. It is thus a little more than the force exerted by the earth on a mass of one milligramme.

E

e. m. f.—An abbreviation of "electromotive force." It is the difference of potential between any two given points in an electrical circuit.

Eadie Chain Co., Ltd.—Redditch, England. Mfrs. chains.

Eads, R. I.—Sales Mgr. Premier Motor Mfg. Co., Indianapolis, Ind.

Eagle Automobile Co.—Rahway, N. J. Mfrs. gasoline automobiles.

Eagle Auto Supply Co.—1780 Broadway, New York City. Supplies.

Eagle Garage & Machine Co.—1907-11 Cropsey St., Brooklyn, N. Y. Garage.

Eagle, J. H. & C. K.—Arch St., Shamokin, Pa. Garage.

Eagle Mfg. Co.—383 Prospect St., Cleveland, O. Mfrs. automobile body and metal polishes.

Eagle Motor Car Co.—Middletown, Conn. Mfrs. gasoline automobiles (Compound cars).

Eagle Oil & Supply Co.—104 Broad St., Boston, Mass. Mfrs. grease, oil, packing.

Eames & Co., A. M.—S. Framingham, Mass. Mfrs. wood wheels for automobiles. Est. 1870.

Eames, Hayden.—Gen. Mgr. Studebaker Automobile Co., Sales Mgr. The Garford Co. B. Shanghai, China, Dec. 19, 1863; ed. various tutors, and public and private schools and U. S. Naval Academy. Mem. Engineers' Club. N. Y.; University Club, Cleveland; Euclid Club, Cleveland; Indiana Club, South Bend. Res. Euclid Heights, Cleveland. Office 1372 E. 12th St., Cleveland, O. In trade since May 25, 1895. Used first car 1896. Recreations, various athletics.

Earl & Carpenter.—Worth, N. C. (Maxwell).

Earl, C. A.—Vice-Pres. The Corbin Screw Corp., New Britain, Conn.

Earl Motor Car Co., The.—Kenosha, Wis. Makers of the Earl car. Agents and dealers: Adams & Engs. 1712 Michigan Ave., Chicago, Ill. John Clayton, Huntington, Ind. Lee Richardson, Redlands, Cal. Schroeder Automobile Co., South Ave. and Hay St., Pittsburgh, Pa. F. Toepfer's Sons, 416 National Ave., Milwaukee, Wis. G. M. Townsend, Maryville, Mo. D. W. Kemp, 120 W. 15th St., Minneapolis, Minn. C. Howe & Co., Minden, Neb. De Lancey Garage, Philadelphia, Pa. A. S. Wilson 1548

Broadway, Denver, Colo. Migliavacca Co., 208 Second Ave., Seattle, Wash.

Earth.—The same as ground, q. v.

Earth-wax.—The same as ozokerite, q. v.

Earth-wire.—See Wire, Earth.

Easland, John N.—Main St., nr. Berkshire Inn, Great Barrington, Mass. Garage; repairs; supplies.

Eason Auto Co.—Wilson, N. C. (Cadillac).

East Hampton Bell Co.—East Hampton, Conn. Mfrs. bells.

East Liverpool Auto Co.—East Liverpool, O. (Maxwell, Mitchell).

East London Rubber Co., Ltd.—57 Arundel St., Sheffield, England. Mfrs. pneumatic tires.

East London Rubber Co.—2-8 Great Eastern St., London, England. Mfrs. spark plugs.

East London Rubber Co.—211 Shore-ditch, London, England. Mfrs. motorcycle motors.

East Side Auto Co.—Minneapolis, Minn. (Queen).

East Side Automobile Sta.—Westminster St., Providence, R. I. (Pennsylvania).

East Stroudsburg Auto Co.—East Stroudsburg, Pa. Garage.

Eastern Auto Co.—306 W. 52nd St., New York City. Garage.

Eastern Automobile Co.—326 N. Broad St., Philadelphia, Pa. (Lozier, Stevens-Duryea).

Eastern Carbon Works.—Jersey City, N. J. Mfrs. ammeters and voltmeters; primary batteries; wire terminals; carbon brushes and specialties.

Eastern Electric Cable Co.—61-63 Hampshire St., Boston, Mass. Mfrs. insulated wire.

Eastern Exchange.—87 Orange St., Newark, N. J. State agent for Gale automobiles and Merkel motorcycles. Est. 1905. Frederick Koch, Prop. Publishers of "Weekly List of Auto Bargains."

Eastern Forge Co.—70 Kilby St., Boston, Mass. Mfrs. drop forgings.

Eastern Motor Car Co.—Elm St. and Cumberland Ave., Portland, Me. (Rambler).

Eastern Oil Tank Co.—136 Fletcher St., Lowell, Mass. Mfrs. oil pumps and storage tanks.

Easternhouse Engine Co.—Taunton, Mass. Mfrs. gasoline and marine motors.

Eastman & Co., H. M.—521½ Main St., Melrose, Mass. (Cadillac, Buick). Est.

Eastman, A. A.—116 Milwaukee St., Oconomowoc, Wis. Garage.

May 1906. Garage, 15 cars. Repairing.

Eastman, H. D.—Framingham, Mass. Garage.

Easton Automobile Co.—41 Delaware St., Easton, Pa. (Franklin, Buick, Pope-Waverley.) Est. 1902. T. Fassitt, Mgr. Garage, 30 cars. Repairing.

Easton Machine Co.—S. Easton, Mass. Mfrs. gasoline automobiles.

Eastwood Wire Mfg. Co.—Belleville, N. J. Mfrs. brass pipe fittings; name plates.

Eaton & Prince.—76 Michigan St., Chicago, Ill. Mfrs. elevators for garages.

Eaton, C. A.—22 E. Concord St., Boston, Mass. (Lambert).

Eaton, Chas. H.—Vice-Pres. and Mgr. Kalamazoo Spring & Axle Co., Kalamazoo, Mich.

Eaton, Cole & Burnham Co., The.—Bridgeport, Conn. Mfrs. brass, iron and steel valves and cocks and fittings for all pressures. Pipe cutting and threading tools and machines. Capital, \$800,000. Est. 1876. F. J. Mulcahy, Pres.; Roger H. Williams, Treas.

Eaton, D. O.—236 N. Broad St., Philadelphia, Pa. (Rapid).

Eau Claire Motor Car Co.—Chase Bldg., Eau Claire, Wis. (Pope-Toledo, Waltham).

Eberhardt Bros. Machine Co.—66-68 Union St., Newark, N. J. Mfrs. metal gear wheels, special automobile machinery.

Eberhart & Son.—Bucyrus, O. Garage.

Ebonite.—A product composed of rubber treated with sulphur to a greater extent than ordinary vulcanized rubber. It is hard and slightly elastic, and capable of taking a durable polish. It is used in automobilism as an insulator in coils, magnetos, batteries, etc.

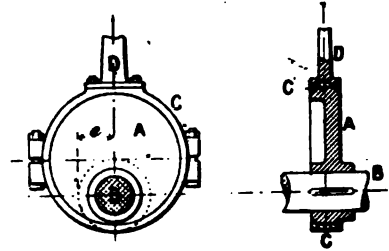
Ebullition.—A rapid evaporation of a liquid in which the vapor escapes in the form of bubbles, which are formed in the interior of the liquid, and, rising to the surface, collapse and permit the vapor to pass into the air. The cloudy vapor seen above the containing vessel, and commonly called "steam," is not steam, but minute globules of water, steam itself being invisible. The laws of ebullition are as follows: (1) The temperature of ebullition or the boiling point increases with the pressure. (2) For a given pressure, boiling begins at a certain temperature, which varies in different liquids, but which for equal pressures is always the same in the same liquid. (3) Whatever be the intensity of the source of

heat, as soon as boiling begins the temperature of the liquid remains stationary. The temperature at which a liquid boils is called its "boiling point." This is very different for different liquids. That of pure water is 212° F., when the pressure on its surface is equal to 30 inches of mercury, or, in other words, when the barometer stands at 30 inches. The nature of the containing vessel varies the boiling point. When the interior of the vessel is rough, the projecting points form centers for developing vapor, and the boiling point is lower than when the surface is smooth. Water boils at a lower temperature in iron than in glass vessels.

Ebullition Carburetter.—See Carburetter.

Eby Mfg. Co.—Lincoln, Neb. (Dragon).

Eccentric.—An arrangement for converting a continuous rotary into an alternate rectilinear motion without the use of a crank. An eccentric is irreversible,



i. e. it cannot produce reverse transformation. It is used for working the link in a link-motion or for operating oil and air pumps, etc., on automobiles. The disk, A, or eccentric sleeve, is secured to the shaft, B, by a key. It is confined by a strap or hoop, C, in which it moves with slight friction. This strap is provided with a groove into which the eccentric fits, while oil is run in between them. The strap is made in halves, the upper of which is fastened to the eccentric rod, D, and connected to the lower by bolts or set-screws. As the sleeve A turns, it gradually draws the rod D back and forth in a path equal to twice the eccentricity, e. The "eccentricity" or "throw of the eccentric" is the distance from the center of the sleeve to the center of the shaft, and equals half the distance which the end of the rod moves, that is, the travel of valve.

Eccentric, Backward.—The eccentric used when a steam-engine is reversed, that is to say, one of the pair always used with link-motion.

Eccentric, Fixed.—An eccentric keyed to its shaft; now almost universally used.

Eccentric, Forward.—The eccentric which drives the slide-valve of an engine while it is running in the forward direction.

Eccentric Pump.—See Pump, Eccentric.

Eccentric-rod.—A rod connected with the eccentric-strap. See Eccentric.

Eccentric-strap.—A metal band surrounding the eccentric and carrying the eccentric-rod. See Eccentric.

Eccles Co., Richard.—Clark and S. Division Sts., Auburn, N. Y. Mfrs. vehicle forgings. Cap. \$100,000. Est. 1880. Richard Eccles, Pres.; W. W. Eccles, Treas.; A. H. Johnson, Sec.

Eccles, Richard.—Pres. Richard Eccles Co.; Clark and S. Division Sts., Auburn, N. Y.

Eccles, W. W.—Treas. Richard Eccles Co., Clark and S. Division Sts., Auburn, N. Y.

Eccleston, J. B.—Pres. and Treas. Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y.

Echo Co.—Young and Delaware Sts., Tonawanda, N. Y. Mfrs. gasolene and marine motors. (Waltham).

Eck Dynamo Motor Co.—Belleville, N. J. Mfrs. electric generators.

Eckel, Andrew.—1080 3rd Ave., Brooklyn, N. Y. Mfrs. vaporizers.

Ecker, J. D.—Keokuk, Ia. (Holsman).

Eckert, Gus.—Supt. Pungs-Finch Auto and Gas Eng. Co., 1524 Jefferson Ave., Detroit, Mich.

Eckert, Hunter.—Vice-Pres. Reading Automobile Co., 26 S. 5th St., Reading, Pa.

Eckhardt, J. C.—Cannstadt, bei Stuttgart, Germany. Mfrs. gauges.

Eckhardt, P. O.—Office Mgr. Continental Caoutchouc Co., 43 Warren St., 2100 Broadway, New York City.

Eckhart, Chas.—Pres. Auburn Auto Co., Auburn, Ind.

Eckhart, F. E.—Vice-Pres. Auburn Auto Co., Auburn, Ind.

Eckhart, Morris.—Sec., Treas. and Gen. Mgr. Auburn Auto Co., Auburn, Ind.

Eckhoff, John.—Anthony St., Waterbury, Conn. Garage.

Eclipse Automobile Co.—955 S. High St., Columbus, O. (Haynes).

Eclipse Auto & Construction Co.—101-107 S. 6th St., Brooklyn, N. Y. (Smith).

Eclipse Auto Rubber Tire Repairing Co.—305 Clifton Pl., Brooklyn, N. Y. Vulcanizing.

Eclipse Engine Works.—Mancelona, Mich. Mfrs. gasolene and marine motors.

Eclipse Machine Co.—Elmira, N. Y. Mfr. coaster brakes for bicycles and motorcycles; full line of machine screw parts, including A. L. A. M. Standard cap screws, hex and castellated nuts on contract. Cap. \$1,000,000. Est. 1902. D. L. Whittier, Pres.; Ray Tompkins, Vice-Pres.; Ralph D. Webster, Sec.; J. E. Morrow, Supt.; G. H. Couper, Gen. Foreman; F. S. Ellett, Foreman Tool Dept.;

Geo. Patterson, Foreman Machine Dept.; Frank Linhart, Foreman Nickel Plating Dept.; Chas. McPherson, Foreman Inspection Dept.

Eco Mfg. Co.—53 State St., Boston, Mass. Mfrs. and dealers, Eco storage tank and generator combined, acetylene torch for firing steam automobiles, dashboard gas lamps, cabin lamps, searchlight brackets. Cap. \$30,000. Est. Dec. 1905. Richard P. Elliott, Pres. and Gen. Mgr.; J. S. Pishon, Treas.; H. C. Elliott, Sec.

Economy Oil & Compound Co.—442 Clark St., Chicago, Ill. Mfrs. grease, oil.

Ecret, Isaac.—Vice-Pres. and Pur. Agt. Geo. W. Nock Co., Inc., 126 N. 4th St., Philadelphia, Pa.

Edaburn, H. W.—110 N. Elm St., Creston, Ia. (Buick; Cadillac).

Eddy Currents.—Currents, called also "Foucault currents," produced entirely within a mass of metal through the movement or alteration in number of the magnetic lines of force passing through it. They tend to occur in the pole-pieces of the field-magnets of dynamos, etc.

Eddy Electric Mfg. Co.—Windsor, Conn. Mfrs. electric generators and motors.

Eddy, H. C.—Vice-Pres. American Motor Truck Co., Caledonia St., Lockport, N. Y.

Edelman, Wm.—914 Pelham Ave., New York City. Garage. Repairing.

Edenfield, R. J.—Sole owner Moore Edenfield Elec. & Mfg. Co., 1033 Broad St., Augusta, Ga.

Edge-cam.—See Cam, Edge.

Edge, Selwyn Francis.—14 New Burlington St., London. Born at Sidney in 1868. General Manager of the S. F. Edge Co. (Limited), Napier automobile. A former bicycle racer who has made numerous records on the road. Manager of the Dunlop Pneumatic Tire Co. in 1869. He won the Bennett cup race in 1902 upon a 40 h.p. Napier and ran the Bennett cup race in 1903 and 1904 upon Napier cars. He has won numerous motor-boat races.

Edge, Selwyn F., Ltd.—14 New Burlington St., London W., England. Mfrs. gasolene automobiles. (Regent cars).

Edgewater Garage.—Evanston Ave. and Winona St., Chicago, Ill. (Buick).

Edgewood Auto Co.—376 Smith St., Edgewood, R. I. (Northern).

Edgeworth Machine Co.—Meadow Road, Edgeworth, Allegheny Co., Pa. (Packard, Franklin, Waltham, Pope-Waverley). Est. 1901. Not inc. Owners, R. L. Anderson, D. C. Anderson. Garage, 30 cars. Repairing.

Edison Storage Battery Co.—Orange, N. J. Mfrs. primary and storage batteries.

Edison, Thomas Alva.—Inventor. B. Milan, O., Feb. 11, 1874. Became newsboy at 12 years of age on Grand Trunk Ry., learned telegraphy, worked as operator, and invented many telegraphic devices. Perfected the incandescent lamp and made electric lighting commercially practical. Invented the phonograph, megaphone, aerophone, kinoscope and scores of other devices. Was made Chevalier, Officer and afterward Commandant, Legion of Honor, by French Gov't. Has been working for several years to perfect a storage battery for vehicle usage that combines long life and great capacity with a minimum weight. Res., West Orange, N. J.

Edler, X.—Hirson, Aisne, France. Mfrs. automobile motors.

Edmunds & Jones Mfg. Co.—315 Riopelle St., Detroit, Mich. Mfrs. automobile lamps and generators, searchlights (marine and auto), launch whistles. Member M. & A. M. Cap. \$40,000. Est. Sept. 1, 1904. D. M. Ireland, Pres.; Geo. E. Edmunds, Sec. and Treas.; W. T. Jones, Supt. Factory; Charles Godley, Foreman Factory.

Edmunds, Geo. E.—Sec. and Treas. Edmunds & Jones Mfg. Co., 315 Riopelle St., Detroit, Mich.

Edmundson, J. W.—Sec. Standard Leather Co., 296 Spring Garden Ave., Allegheny, Pa.

Edsall, J. M.—Treas. E. R. Thomas Motor Co., 1200 Niagara St., Buffalo, N. Y.

Edstrom, A.—1474 W. Madison St., Chicago, Ill. Garage.

Eduction.—The same as exhaust.

Edwards & Co.—405 E. 144th St., New York City. Mfrs. bells.

Edwards & Peck.—Rye, N. Y. (Pope-Hartford).

Edwards, A. G.—534 N. High St., Columbus, O. (Indian.)

Edwards, A. J. M.—Mgr. N. Y. Branch, Electric Vehicle Co., 134 W. 39th St., New York City.

Edwards Bros.—London, England. (Monarch).

Edwards, H. J.—Chief Engineer Dayton Motor Car Co., Dayton, O.

Edwards, L. K.—Masonic Block, Escanaba, Mich. (Cadillac).

Edwards Non-Skid Syndicate.—Queen Anne's Chambers, Westminster, London S. W., England. Mfrs. non-skids.

Edwards, Ralph.—Malvern, Pa. Garage.

Eerste Amsterdamsche Bandenrijwielen & Motorrijwielen Fabriek.—27 Helmerstrasse, Amsterdam, Holland. Mfrs. motorcycles.

Eerste Nederlandsche Rijwiefabriek.—Deventer, Holland. Mfrs. motorcycles.

Efficiency.—As applied to a motor, the "efficiency" is the ratio between the actual work performed and heat-unit supplied. As applied to a motor-vehicle, efficiency is the ratio between the power developed by the engine and that delivered at the rear wheels. In general, efficiency is the ratio between the useful energy obtained from a particular machine and the energy put into it.

Efficiency at the Wheel-rim.—What is called the efficiency at the wheel-rim in a motor-vehicle is the ratio of the effective power capable of being collected upon the wheels or at the rim of the wheels to the power of the motor. Such ratio measures, in a manner, the perfection of the transmission, since the residue indicates the losses due to the gearings, shafts and intermediate cardan joints of the transmission. The efficiency at the rim of car wheels is quite low (0.50 to 0.65). In electric cars it is usually 0.80. Such difference is doubtless due to the regularity of the motor-couple and to the more favorable load of the gearings, electric vehicles being generally of restricted power. Efficiency of the rim is measured by the brake.

E. G. A. (Entrepot General d'Automobiles).—209 Blvd. Pereire, Paris, France. Mfrs. gasoline automobiles (E. G. A. cars).

Egan & Grinnell.—Seabreeze, Fla. Garage.

Egbers, Th.—Hertogstrasse 58, Nimeguen, Holland. Mfrs. bodies.

Egg & Co., R.—46 rue de Lyon, Paris, France. Mfrs. gasoline automobiles (Eleva cars).

Eggermont, M. E.—9 rue du Petit-Dock, Gand, Belgium. Mfrs. marine motors.

Egglesore, W. H.—Mgr. Warsaw Garage Co., 208 Indiana St., Warsaw, Ind.

Ehlbert, Chas. A.—Greenville, Miss. Garage.

Ehrhardt, Heinrich.—Düsseldorf, Germany. Mfrs. gasoline commercial and gasoline automobiles (Ehrhardt cars).

Ehrlich & Son, J.—1345 Broadway, New York City. Mfr. eye shields.

Eib, Calvin C.—Vice-Pres. Pioneer Auto Co., 901-25 Golden Gate Ave., San Francisco, Cal.

Eichberg, Benjamin.—Pres. Auto Import Co., 1786 Broadway, New York City.

Eichorn & Black.—9 Hill St., Newark, N. J. (Crawford).

Eickemeyer & Osterheld.—5 Neppershan St., Yonkers, N. Y. Garage.

Eidam, Adam.—15 N. Wyoming St., Hazleton, Pa. Garage.

Eidam, Dr. C. H.—Lawrence, Mass. (Jackson).

Eikenberry, A. L.—126 W. 4th St., Greenville, O. (Northern).

Eilers & Klierath.—241 W. 107th St., New York City. Garage.

Eisemann und Co., Ernst.—Stuttgart, Germany. Mfrs. high and low tension magnetos.

Eisendrath Glove Co.—Armitage and Elston Ave., Chicago, Ill. Mfrs. wearing apparel (gloves and gauntlets).

Eisenhardt, C. A.—Sales and Adv. Mgr. Sayers & Scovill, 2247-61 Colerain Ave., Cincinnati, O.

Eisner, Felix A.—Designer and Engineer, Gearless Transmission Co., Rochester, N. Y.

Ekstromer Accumulator Co.—13 Walbrook, London E. C., England. Mfrs. electric automobiles (Ekstrom cars).

Elastes.—rue Danton, Levallois-Perret, France. Tire filling.

Elastic Limit.—The extent to which a body may be deformed or strained and still retain the power of completely recovering its original shape when the stress is removed. If the elastic limit be exceeded, the body does not recover its previous form on the removal of the stress, but retains a permanent alteration of form or a "set."

Elasticity.—A general property of bodies, by virtue of which they are capable, within certain limits, of resuming their original form, when the external force which deformed them has ceased to act. So long as such external force is no greater than the internal force holding the molecules together the bodies will resume their form.

Elasticity: Hooke's Law.—If an "elastic" substance be strained or loaded in any way, then, within certain limits of load varying with the nature of the substance used, the strains produced are proportional to the loads. The law is now usually expressed in the form

$$\frac{\text{stress}}{\text{strain}} = \text{constant},$$

and this constant is known as the "elasticity" of the substance.

Elastic Tire Filling Co.—52 Church St., Boston, Mass. Tire filling.

Elastro Co., The.—256 Broadway, New York City. Mfrs. tire filling compound.

Elastro Mfg. Co., The.—26 State St., Hartford, Conn. Mfrs. tire fluid.

Elbow.—A short length of pipe making a joint between two pipes at an angle usually of ninety degrees. (2) A joint where two pipes meet at angle.

Elbow, Return.—An elbow in a pipe itself like a letter U. Used in connecting the pipes of condensers and the like.



Elbridge Electric Co.—Elbridge, N. Y. Mfrs. electric generators, magnetos and ignition dynamos, spark coils, spark plugs.

Elder & Co., G. B.—Buoxi, Miss. Garage.

Eldredge Electric Mfg. Co.—7 Post Office Square, Springfield, Mass. Mfrs. ammeters and voltmeters, electric switches.

Eldridge Beebe Auto Garage Co.—1st Main and State Sts., Marshalltown, Ia. (Rambler).

Electrical & Mechanical Development Co.—Asbury Park, N. J. Mfrs. soldering sticks, electric current rectifiers.

Electrical Construction & Supply Co.—537 S. Main St., Findlay, O. (Columbus).

Electrical Construction Co.—Racine, Wis. (Mitchell).

Electrical Construction Co.—1126 S. Main St., Los Angeles, Cal. (Baker, Columbus, Dolson, Mora, Pope-Waverley).

Electrical Review.—13 Park Row, New York City. Pub. weekly by Electrical Review Pub. Co.

Electrical World.—239 W. 39th St., New York City. Pub. Weekly by McGraw Pub. Co.

Electric Automobile Co.—14 Bryan St., Savannah, Ga. (Columbus).

Electric Cab Co.—238 W. 50th St., New York City. Garage.

Electric Charge.—A definite quantity of electricity or of electrification.

Electric Charging Station.—200 Pearl St., Buffalo, N. Y. Garage.

Electric Contract Co.—202 Centre St., New York City. Mfrs. primary batteries, spark coils.

Electric Discharge.—The dissipation of electricity or loss of charge from a body. It may be accompanied with visible phenomena, such as sparks, etc., or it may be of a nature not evident to the senses, and only to be detected by electrical means.

Electric Energy.—See Energy, Transformation of.

Electric Field.—See Field, Electric.

Electrical Ignition.—See Ignition.

Electric Ignition Co.—Sparkbrook, Birmingham, England. Mfrs. spark plugs, coils, storage batteries (E. I. C.).

Electricity.—A powerful physical agent, which manifests itself mainly by attraction and repulsion, but also by luminous and heating effects, by violent shocks, by chemical decomposition, and many other phenomena.

The study of the properties of bodies charged with electricity and the charges of which are supposed to be in equilibrium is termed "electrostatics;" and the study of the properties of bodies of which the potentials are different, and

between which is established a current, is called "electrodynamics."

Electricity, High-tension.—Electricity of high pressure, such as that produced by an induction coil. High-tension electricity will jump, in the form of a spark, across a gap between two live conductors; but low-tension electricity will not.

Electric Launch Co., The.—Ave. A and North St., Bayonne, N. J. Makers of Elco motor boats, first marketed in 1892. H. R. Sutphen, Gen. Mgr.; A. E. Luders, Designer; E. A. Conrad, Pur. Agt.; T. S. Hanson, Adv. Mgr.

Electric Power.—See Power, Electric.

Electric Rubber Mfg. Co.—Rutherford, N. J. Mfrs. inner tire tubes.

Electric Signs & Signals Co.—177½ E. 87th St., New York City. Mfrs. annunciators, automobile mirrors.

Electric Smelting & Aluminum Co.—W. Jackson St., Lockport, N. Y. Mfrs. aluminum, brass and copper metals.

Electric Storage Battery Co.—Allegheny Ave. and 19th St., Philadelphia, Pa. Mfrs. "Exide" storage batteries. Member M. & A. M. Cap. \$20,000,000. Est. 1888. Herbert Lloyd, Pres.; Grant B. Schley, 1st Vice-Pres.; John R. Williams, 2nd Vice-Pres.; Chas. Blizard, 3rd Vice-Pres.; W. G. Henderson, Sec. and Treas. Branches, New York, Chicago, Boston, Cleveland, Atlanta, St. Louis, San Francisco and Toronto, Can. Agent, Canadian General Electric Co., Ltd., Toronto, Can.

Electric Supply Co.—309 Bull St., Savannah, Ga. (Ford, Queen, Pope-Waverley).

Electric Vehicle & Garage Co.—621 Grand Ave., Milwaukee, Wis. (Waltham).

Electric Vehicle & Supply Co.—621 Grand Ave., Milwaukee, Wis. Mfrs. storage batteries and charging apparatus.

Electric Vehicle Co.—502 N. Broad St., Philadelphia, Pa. (Columbia.) Garage.

Electric Vehicle Co.—1 Laurel St., Hartford, Conn. Maker of the Columbia car, first marketed, 1897. Thirty-six models made since. Cap. \$20,000,000. Walter G. Henderson, Pres.; J. B. Entz, 1st Vice-Pres. and Designer; H. W. Kyte, 2nd Vice-Pres. and Sales Mgr.; E. G. Steinmetz, Supt.; W. A. McAneeny, Purch Agt.; F. E. Dayton, Advt. Mgr.; A. J. M. Edwards, Mgr. New York Branch; F. W. Nichols, Supt. New York Repair Station; W. F. Fischer, Mgr. Chicago Branch. J. H. MacAlman, Mgr. Boston Branch.

Electric Vehicle Co.—134 W. 39th St., New York City. (Columbia.) Garage 621 W. 42nd St. Repairing.

Electric Vehicle Co.—1332 Michigan Ave., Chicago, Ill. (Columbia).

Electric Vehicle Equipment Co.—20th St. and Montgomery Ave., Philadelphia, Pa. Mfrs. electric controllers, motors and automobiles.

Electric Welding.—See Welding, Electric.

Electrode.—The conductor by which a current enters and leaves an electrolyte. The positive electrode is the "anode" and the negative the "cathode." See Electrolyte, Anode and Cathode.

Electrodynamics.—The laws in general which govern the mechanical action of currents between themselves. A current develops a magnetic field of which the circular lines of force surround the conductor in which it circulates. The direction of these lines of force is given by Maxwell's law: "The direction of the lines of force is that in which a corkscrew must turn in order to move in the direction of the current. (Fig. 1.)"

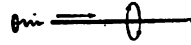


Fig. 1.



Fig. 2.

The field of a current is of the same nature as that of a magnet and has all its properties. The phenomena of attraction and repulsion are governed by Ampere's laws: "(1) Two parallel currents of the same direction attract each other; and, if of contrary direction, repel one another; (2) two currents forming an angle with each other attract each other and tend to place themselves parallel with each other when both recede from or approach the apex of the angle; (3) two rectilinear and parallel currents act upon each other with a force proportional to the product of their intensities by their lengths, divided by the square of their distance."

The mutual action of the circular and parallel currents of a solenoid (Fig. 2) modifies the field of each of them, so as to give a resultant field such as shown in the figure. A solenoid is therefore assimilable to a magnet. Its poles can be found by applying Maxwell's law.

Electro-Industrielle, Société Anonyme.—40 rue du Chemin-Vert, Paris, France. Mfrs. spark plugs.

Electrolysis.—The chemical decomposition of a body under the action of a current. The operation is usually performed upon a solution of the body to be decomposed called an "electrolyte."

The positive and negative conductors carrying the current are called respec-

tively the "anode" and "cathode." The liberated bodies or "ions" are "anions" at the anode, and "cations" at the cathode. The weight of electrolyte decomposed by the current is proportional to the quantity of electricity absorbed. The weights of anions and of cations set free are chemically equivalent.

Electrolyte.—A liquid having the property of conducting electricity by means of electrolysis, or the splitting up of its molecules into separate atoms or groups of atoms termed "ions." The ions themselves carry charges of electricity, and travel with a small but definite velocity through the liquid. See Ion.

Electro-magnet.—An apparatus consisting essentially of a coil wound around an iron core. The field due to the coil induces in the core a much greater flux than it would induce in the air, because of the great permeability of iron. When the current is shut off the greater part of the magnetism of the core vanishes. The residual magnetism or remanent magnetization depends on the nature of the core. It is minimum in soft iron and maximum in hard steel. A core of this last metal, magnetized by the passage of a current retains a notable proportion of its magnetism and constitutes a permanent magnet.

Electro-magnetism.—The study of the mutual actions of currents and magnets. A current develops a magnetic field of which the circular lines of force surround the conductor in which it circulates. As the currents may be assimilated to magnets, the attraction or repulsion of the lines of force, of parallel or inverse direction permits of deducing therefrom, a priori, the laws of the mutual action of magnets and currents, which laws are verified by experiment. The first of these laws, relative to the action of a current upon a magnetized needle, was discovered by Oersted. The calculation of the attractive and repulsive forces in play serves as a basis of all measuring apparatus, such as galvanometers and derived instruments. Finally, a category of electro-magnetic phenomena discovered by Faraday (the phenomena of electro-magnetic induction) forms the starting-point of all the industrial applications of electricity.

Electro-metallurgy.—Metallurgical processes carried on either by the heat of the electric furnace, or by the chemical action of an electric current. Aluminum and much of the pure copper used for electrical purposes is prepared in this way.

Electrometer.—An apparatus for measuring the difference of potential, and based upon electrostatic action. Other apparatus for the same purpose are: Gal-

vanometers, for electromagnetic action;

electrodynamometers, for electrodynamic action; thermic voltmeters, for thermic action. Electrometers consist essentially of fixed quadrants between which moves an armature. The quadrants and the armature are put in communication with the conductors of which it is a question of measuring the difference of

potential. The static charges of electricity which the quadrants and armature take exert between them an equivalent antagonistic effort, from which the difference of potential sought may be deduced.

The figure shows one of Lord Kelvin's direct-reading electrometers or electrostatic voltmeters adapted for measuring electromotive forces of from 40 to 800 volts. It is especially employed for alternating currents. It is formed of a series of superposed quadrants, *a*, between which moves a series of paddle-shaped needles; *b*, suspended at *c* by a wire that transmits the torsion effort and the current. The oscillations are absorbed by a disk, *d*, fixed to the movable portion and immersed in a liquid.

Electromobile.—A term used as a designation for an automobile driven by an electric motor. Electromobiles are divided into two classes: (1) accumulator vehicles, and (2) gasoline-electric vehicles (*a*, mixed; *b*, with electric transmission). The accumulator-vehicles are the most widely distributed and generally comprise a battery of 44 elements capable of being charged on a

110-volt circuit. Their motors are consequently supplied with about 88 volts. The modern cars are all provided with two motors or with one motor with two collectors.

Such an arrangement permits of regulating the speed by the coupling of the motors in series or in parallel, with or without resistance, without touching the battery. The old method of coupling the elements had the very serious disadvantage of causing them to work integrally. The motors are almost always of the series type, but sometimes of the compound type. The changes of coupling are effected by means of a controller (see Controller).

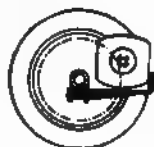
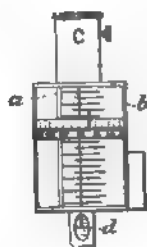


Fig. 1.

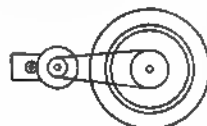


Fig. 2.

The drive is always through gearings.



Fig. 3.

The arrangements employed vary according as the carriage comprises two motors or one motor with two collectors. In the first case the differential is eliminated and each wheel, front and rear, is actuated by a motor. The suspension of the latter is always elastic (Fig. 1). In the second case chain drive is adopted (Fig. 2), or else the differential is controlled either by spur pinions (the motor being elastically mounted on the axle), or by bevel pinions and propeller shaft, the motor being fixed to the frame (Fig. 3). The arrangement shown in Fig. 3 is a rational one from several viewpoints. The motor is in a better place and better suspended than when attached to an axle, and the gearings run in the oil of the gear cases, a fact not always the case in other arrangements. The Milde arrangement, comprising a motor suspended from the rear axle, with a single inductor and two separate armatures actuating individually one driving-wheel is interesting and possesses the great advantage of doing away with the differential.

Electromobile Co., Ltd.—7 Curzon St., Mayfair, London W., England. Mfrs. electric automobiles (Electromobile cars).

Electromotive Force.—That which tends to cause the motion or flow of electricity. It is frequently termed "electric pressure," or simply "pressure" by electrical engineers.

Electron.—A term for the infinitely small particles of which bodies are composed, used in the recent theories as to matter and electric energy. A body in a neutral state is supposed to be formed of positive and negative "electrons" in equilibrium. Under the influence of external energies, the negative electrons detach themselves in order to communicate a negative charge to adjacent bodies, the body primitively neutral remaining charged positively. Universal attraction and chemical affinity are supposedly forms of electric action.

Electrostatics.—See Electricity.

Electrum.—An alloy of copper, zinc and nickel.

Elektrotechnischefabrik Lutz.—Hornergasse 12, Zürich, Switzerland. Mfrs. low tension magnetos.

Elevator Supply & Repair Co.—76 W. Monroe St., Chicago, Ill. Mfrs. lubricators.

Elgin Hardware Co.—Elgin, Ill. (Cartercar.)

Elliott-Blair Steel Co.—Taylor and Mercer Sts., New Castle, Pa. Mfrs. steel.

Elite Mfg. Co.—Ashland, O. Supplies. **Elizabeth Motor & Cycle Co.**—16 Julian Pl., Elizabeth, N. J. (Indian.)

Elizabeth Motor Car Co.—14 Westfield Ave., Elizabeth, N. J. (Maxwell, Rambler).

Elkhart Brass Mfg. Co.—Prospect St., Elkhart, Ind. Mfrs. primary batteries, brass, bronze, aluminum and copper castings, oil guns.

Elkhart Garage Co.—Elkhart, Ind. (White, Maxwell, Mitchell).

Ellas, Charles A.—Bath, N. Y. Garage.

Ellenberger, A. W.—Pres. Hydraulic Pressed Steel Co., E. 61st St., Cleveland, Ohio.

Ellerd Bros.—Plainview, Tex. (Acme).

Ellerd, J. J.—Vice-Pres. and Gen. Mgr. Union Automobile & Supply Co., Plainview, Tex.

Ellerd, Reuben M.—Pres. Union Automobile & Supply Co., Plainview, Tex.

Ellett, F. O.—Foreman Tool Dept., Eclipse Machine Co., Elmira, N. Y.

Elliot & Coleman.—339 Bush St., San Francisco, Cal. (American).

Elliott & Co., W. J.—185 Franklin St., Boston, Mass. Mfrs. tire irons.

Elliott, Allmand B.—Vice-Pres. and Elec. Engineer Witherbee Igniter Co., 541 W. 43rd St., New York City.

Elliott Bros.—Century Works, Lewisham, England. Mfrs. speed indicators.

Elliott, H. C.—Sec. Eco Mfg. Co., 53 State St., Boston, Mass.

Elliott, Richard P.—Pres. and Gen. Mgr. Eco Mfg. Co., 53 State St., Boston, Mass.

Elliptic Spring.—See Spring, Elliptic.

Ellis & Co., Jesse.—Maidstone, Kent, England. Mfrs. steam commercial automobiles.

Ellis & Edwards.—Rochester, Minn. Garage.

Ellis, Fred.—Methuen St., Lawrence, Mass. (Pope-Hartford).

Ellis, J. C.—210 Saginaw Ave., Flint, Mich. Garage.

Ellis Motor Car Co.—222 Halsey St., Newark, N. J. (Pierce-Arrow).

Ellisville Auto Co.—Ellisville, Ill. (Waltham).

Ellsworth & Thayer Mfg. Co.—Milwaukee, Wis. Mfrs. miscellaneous wearing apparel, gloves and gauntlets.

Ellsworth, F. V. P.—Hot Springs, Ark. (Waltham).

Ellsworth, J. M.—518 W. 22nd St., New York City. Mfrs. alloy steel automobile products.

Elm City Brass Co.—New Haven, Conn. Mfrs. brass, bronze, aluminum and copper castings.

Elmer Auto Co.—Hartford, Conn. (Ford, Rambler).

Elmira Automobile Club.—F. H. Richardson, Pres., Elmira, N. Y.

Elmore Auto Co.—1851 Broadway, New York City. (Elmore).

Elmore Mfg. Co.—Clyde, O. Makers of the Elmore car, first marketed, 1900. Fourteen models made since. H. V. Becker, Pres.; J. H. Becker, Sec.; B. A. Becker, Treas. Agents and dealers: Adams & Hart, 49 N. Division St., Grand Rapids, Mich. Atwood Automobile Co., 2815 Monroe St., Toledo, O. Berwin Auto Co., Allentown, Pa. Butts, A. M., Oneonta, N. Y. Carmichael-Bray Co., 370 Golden Gate Ave., San Francisco, Cal. Chabot, Chas. J., Dallas, Tex. Crowthers Co., Robert C., 117 E. 17th St., Cincinnati, O. Dunbar & Mansir, 302 High St., Holyoke, Mass. Elmore Motor Car Co., 1228 S. Figueroa St., Los Angeles, Cal. Fee-Bock Auto Co., The, 254 Jefferson St., Detroit, Mich. Gawthrop & Wister, 244 N. Broad St., Philadelphia, Pa. Gawthrop, W. W., Gen. Sales Agt., 244 N. Broad St., Philadelphia, Pa. Hamilton Motor Car Co., Hamilton, O. Haynes, C. E., Cadillac, Mich. Herrick, A. E. Pocono Lake, Pa. Hoffman Hardware Co., Jos., Sharon, Pa. Hoyt, A. H., Penacook, N. H. Hughes, Chas. C. Co., 643 Maryland Ave., Washington, D. C. Hughes, S. A., Kingston, N. Y. Lockwood & Co., F. E., 39 Wall St., Norwalk, Conn. Lorain Auto Co., Lorain, O. Manuel Bros., Richford, Vt. Megargel, Ralph G., Scranton, Pa. Mar-Del Mobile Co., Baltimore, Md. Newell, Jas. R., 819 Hay St., Wilkesburg, Pa. Parker & Co., F. R., 288 Columbus Ave., Boston, Mass. Porter, Walter R., Keene, N. H. Parker, Wm. A., Las Independencia 12, Mexico, Mex. Prindle, B. A., Barre, Vt. Pugh Bros., Providence, R. I. Ranney, A. E. & Co., 1851 Broadway, New York City. Robertson, J. W., Robertson Motor Car Co., Taunton, Mass. Robinson, Jas. E., Oil City, Pa. Shaler Co., C. A., Waupun, Wis. Smith, A. J., Gen. Sales Agt., 1228 S. Figueroa St., Los Angeles, Cal. Waite, Geo. W., Albany, N. Y. Walker, Mrs. W. K., Burlington, Vt. Hutts & Co., Jacksonville, Fla. Skehan, W. J., Augusta, Me. Wallace Buggy Co., Chattanooga, Tenn. Union Auto Co., Washington, D. C. Murphy, A. H., Erie, Pa.

Elmore Motor Car Co.—1228 S. Figueroa St., Los Angeles, Cal. (Elmore).

Elmwood Garage.—189 Cleveland Ave., Buffalo, N. Y. Garage.

Elongation.—The amplitude of the angle described by a measuring apparatus which starts from zero and ends at a maximum value. This word is employed especially with galvanometers where the value of the elongation shows exactly the value of the current passing in the galvanometer.

Elongation of Metals.—When a bar of metal is submitted to efforts of traction,

it either breaks (the effort exceeding the limit of elasticity of the metal), or elongates to a greater or less extent. Such elongation is proportional to its length and to the load that it supports, and is inversely proportional to its straight section. Tool steel, when hardened and drawn to straw color elongates but very slightly; aluminum has almost no elongation; cast iron elongates but very slightly; wrought iron elongates enormously; Bessemer steel of good quality shows a fairly good elongation, thirty-point carbon steel of good quality shows up fairly well; nickel steel in the normal state gives a good test. Chrome nickel steel of good quality in the normal state gives a good test; and chrome nickel steel of good quality in the normal state elongates considerably.

El Paso Foundry & Machine Co.—El Paso, Tex. (Cadillac).

Elsass Elektrizitätswerke, Otto Schulze.—10 bis rue de l'Arcen-Ciel, Strassbourg (Elsass), Germany. Mfrs. speed indicators.

Elton Automobile Co.—156 E. Main St., Waterbury, Conn. (Reo, Rambler).

Elvey, Frank O.—Douglas, Ariz. (Cadillac).

Elwell Parker Electric Co.—1076 Hamilton St., Cleveland, O. Mfrs. electric controllers and motors.

Elwood, Kinner.—Gen. Mgr. Ohio Valley Auto Co., 3 Main St., Greenup, Ky.

Elyria Automobile Club.—H. N. Address, Sec., Elyria, O.

Elyria Machine Parts Co., The.—Elyria, O. Mfrs. brass, bronze, aluminum and copper castings, screw machine products and steering apparatus. Selling agts., The American Distributing Co., Cleveland, O.

Embley & Co., W. W.—614 Main St., Asbury Park, N. J. Garage.

Embree Co., W. F.—McGarry Bldg., Union and Washington Sts., Lynn, Mass. Garage.

Emeny Co., G. J.—Hubbard St., Fulton, N. Y. Garage.

Emergency-brake.—See Brake. Emergency.

Emergency Spring Repairer Co.—80 Broad St., New York City. Mfrs. spring repairers.

Emergency Wheel & Novelty Co.—Port Huron, Mich. Mfrs. gasoline tank gauges.

Emerson, F. M.—118 William St., Manchester, N. H. Garage.

Emery.—A variety of "corundum" much used as an abrading agent. It is found in many places, especially on the Island of Naxos, at Cape Emeri; whence it is exported in large quantities. The mineral is crushed, brayed, and brought by levigation to the state of powder. In

commerce the fineness of emery is designated by numbers, running from 1 to 120. No. 120 is nearly impalpable.

Emery is used for the polishing of metals, glass, etc. In automobilism it is used for polishing the surface of motor valves and grinding them in their seats. See *Corundum*.

Emery-buff.—See *Emery-wheel*.

Emery-cloth.—Powdered emery attached to cotton cloth by glue. It is used for finishing metal surfaces.

Emery-paper.—Powdered emery attached to paper by glue.

Emery-wheel.—A wheel consisting of powdered emery made up into a solid mass, with some kind of cement, and used for grinding metal surfaces and sharpening tools. Wheels made of the finest emery are used for polishing and are termed "emery-buffs."

Emery Bros.—Kennebunkport, Me. Repairing.

Emery, E. H.—Mgr. Iowa Auto Co., Ottumwa, Ia.

Emery, John A.—Treas. Boston Steam Specialty Co., 170 Congress St., Boston, Mass.

Emery Mfg. Co.—Bradford, Pa. Mfrs. grease, oil.

Emmert Mfg. Co.—Waynesboro, Pa. Mfrs. gray iron castings; vises.

Emmetsburg Auto & Gas Engine Co.—Emmetsburg, Ia. (Jackson).

Emmons Co., E. Gerry.—Swampscott, Mass. Mfrs. motor boats.

Emond, J. P. & W. H.—474 Parker St., Boston, Mass. Mfrs. wood and metallic bodies.

Empire Auto Co.—Greenwich, Conn. (Maxwell).

Empire Automobile Tire Co.—Trenton, N. J. Mfrs. tire cases, tire pumps, tire irons, patches, repair kits, inner tubes and pneumatic tires. Branches: 292 Devonshire St., Boston, Mass.; 20 La Salle St., Chicago, Ill.; 1615 Wabash Ave., Chicago, Ill.; 148 Chambers St., and 2230 Broadway, New York City.

Empire Depth Gauge Co.—120 Liberty St., New York City. Mfrs. gauges.

Empire Garage.—97 North St., Middletown, N. Y. (Cadillac).

Empire Gear & Top Co.—413 N. 22nd St., Philadelphia, Pa. Mfrs. automobile covers, cushions, foot rests, robe rails, automobile seats and tops, glass wind shields.

Empire Mfg. Co.—Helena St., Birmingham, England. Mfrs. jacks, chains.

Empire Rubber Co.—115-117 Worth St., New York City. Mfrs. lamp covers.

Empire Rubber Mfg. Co.—Trenton, N. J. Mfrs. rubber mats, cloth and tubing.

Empire State Dry Battery Co.—70 Fulton St., New York City. Mfrs. primary and storage batteries.

Empire State Engineering Works.—555

E. 116th St., New York City. Mfrs. gasoline commercial automobiles.

Empire State Motor Car Co.—2148 Broadway, New York City. (Queen). Est. 1906. Cap. 100,000. Herman Raub, Pres.; Otto Trieb, Treas.; Leroy D. Ball, Sec.; William Arnold Malone, Supt. of Garage; Charles Coon, Head Mechanician. Garage, 250 cars. Repairing.

Empire State Tire Co.—Buffalo, N. Y. Mfrs. tire pumps, repair vulcanizers, jacks, pneumatic tires, non-skids.

Enamelling.—The operation of covering the surface of metals with non-metallic coatings similar in aspect to varnish.

The following kinds are distinguished: (1) Vitrified enamelling, which consists in covering, at a red heat, the surface of a metal (most usually cast-iron) with a coat of vitrifiable materials, somewhat analogous to glass; (2) varnish enamelling, consisting in covering the metal at moderate temperatures with a varnish having more or less color. This is the process used for enamelling the tubes of bicycles and the chassis of motor-cars, and also the bodies of carriages, etc. The material can be applied cold, or each coat be hardened in an oven before the next is applied. The base of this class of enamels is resin, amber, or asphalt, dissolved in turpentine or boiled oil.

Enders, August.—Oberhamed bei Ludenscherd, Westphalia, Germany. Mfr. chains.

Endothermics.—Bodies of which the decomposition absorbs a certain quantity of heat. This is the case with the majority of compound bodies, which disengage a certain number of heat units at the moment of their formation and which must be restored to them when the decomposition is effected by heat. For example, the formation of sulphide of iron disengages a certain quantity of heat, which will have to be absorbed, without a rise of temperature, in the roasting or decomposition of the sulphide by heat.

End-thrust.—See *Thrust, End*.

Eneas, A. G.—50 Congress St., Boston, Mass. Mfr. aprons and storm curtains.

Energy.—The equivalent of work done, and work stored up in one form or another. Energy is, therefore, capacity for doing work. "Potential energy" is the capacity for doing work which a body possesses in consequence of its position or condition. "Kinetic energy" (energy of motion) is the capacity for doing work which a body possesses in consequence of its mass and velocity, and is measured by its mass multiplied by its velocity squared, or rather by the amount of work which has been done to impart its velocity to its mass.

Energy, Transformation of.—Energy, the cause of every phenomenon, is, at the same time, the effect of such phenomenon. The principle of the conservation of energy shows us that the energy of a system is an invariable quantity which can neither be increased nor diminished.

We expend, then, a certain energy under a given form, only to find it again under another form. This is what is termed "transformation of energy." Energy is exhibited in the following forms: (1), thermic energy; (2) mechanical energy; (3), chemical energy; (4), electric energy.

Whatever be its form, it always possesses a mechanical equivalent, and is therefore homogeneous with a work.

Thermic energy is transformed: (1), into "chemical energy" in the various chemical combinations which are endothermic, i. e., which are formed with absorption of heat; (2), into "mechanical energy" in thermic steam, gas or gasolene, and hot air engines, the starting point of which is the transformation of calorific energy according to the methods peculiar to each type of motor in the phenomena of change of physical state; (3), into "electric energy" in thermic batteries (thermo-electricity), which utilize the differences in temperature between two junctions for producing differences in potential of the points considered.

"Chemical energy" can be transformed: (1), into "electric energy" in batteries, in which the chemical energy of the various bodies brought into the presence give rise to electric energy; (2), into "mechanical energy" in the various phenomena of slow or rapid dissociation of bodies; (3), into "thermic energy" in the combinations which are formed with the introduction of heat, and which are called exothermic combinations.

"Mechanical energy" is transformed: (1), into "chemical energy" in certain combinations produced, for example, by the compression of gases. In most cases mechanical energy is transformed into chemical energy only through the intermedium of thermic or electric energy; (2), into "thermic energy" in shocks, friction, slidings, etc., and in the phenomena of compression or expansion of gases. The friction of shafts in their bearings, in transmissions, absorbs mechanical energy and transforms it into thermic energy, which is shown by the rise in temperature of the parts in contact; (3), into "electric energy" in generators of electricity, as magneto-electric, dynamo-electric and electro-static machines, whatever the form of electric energy considered.

"Electric energy" is transformed: (1), into "chemical energy" in the phenomena of electrolytic or electrothermic chemistry; (2), into "mechanical energy" in electro-motors, electro-magnets and all their applications (control of apparatus at a distance, telegraphy and transmission of vibrations in telephony); (3), into "thermic energy" for the production of electric light and electric soldering, for the production of the high temperatures used in electrothermics, and the heating of conductors.

All the forms of energy may present themselves in the most diverse forms and the same transformation may give rise to many forms of energy. Thus, the transformation of mechanical into electric energy in dynamo-electric machines gives rise, along with electric energy, to thermic energy by the friction of revolving parts, the heating of conductors, the phenomena of hysteresis, and Foucault currents. These are the productions of energy under thermic form that reduce the efficiency of such transformation of energy, taken only from the viewpoint of the production of electric energy. But all the energy brought in play is found again in some form or another, according to the immutable principle of the conservatism of energy enunciated in various forms by Lavoisier, Rumfort, Meyer and others.

Enfield Autocar Co.—Redditch, England. Mfrs. gasolene automobiles (Enfield cars).

Enfield Cycle Co.—Redditch, England. Mfrs. motorcycles.

Engel, Louis, Jr.—437 Pearl St., Buffalo, N. Y. (Cartecar).

Englebert fils et Cie., O.—29 rue des Vennes, Liège, Belgium. Mfrs. non-skids, solid tires and pneumatic tires.

Engelhard, F.—Treas. Hercules Float Works, 200 Franklin St., Springfield, Mass.

Engelhard, F. H.—Sec. Hercules Float Works, 200 Franklin St., Springfield, Mass.

Engelhard, W. A.—Gen. Supt. Hercules Float Works, 200 Franklin St., Springfield, Mass.

Engelmann, Paul.—Delitzscherstrasse 15, Leipzig-Eutritzsch, Germany. Mfr. springs.

Engine.—A piece of mechanism used to convert heat, or some other form of energy into mechanical work; in other words, a machine for the development of power from some source of energy, such as coal, gas, oil, etc. See Motor.

Engine, Compound.—A steam-engine in which steam is partly expanded in one cylinder and then allowed to enter a second, or low-pressure, cylinder, in which it is further expanded.

Engine, Diesel.—See Cycle, Diesel.

Engine, Explosion.—Same as internal combustion motor.

Engine, Gas.—An internal combustion engine in which the fuel used is hydrocarbon gas.

Engine, Gasolene.—An internal combustion engine in which the fuel used is an inflammable vapor formed by a mixture of gasolene and air.

Engine, Naphtha.—See Motor, Naphtha.

Engine, Rotary.—An engine in which the chief moving parts have a rotary instead of reciprocating motion.

Engine, Steam.—See Steam-engine.

Engineer, The.—Pub. at London, England.

Engineer, The.—355 Dearborn St., Chicago, Ill. Pub. by Taylor Pub. Co., s. m.

Engineering.—Pub. at London, England.

Engineering Record, The.—239 W. 39th St., New York City. McGraw Pub. Co., weekly.

Engineering Specialty Co., Inc.—143 Liberty St., New York City. Mfrs. electric generators, magnetos and ignition dynamos, charging apparatus.

Engineers' Review.—Cleveland, O. The Engineers' Review Co., pubs., m.

England, G. W.—2210 Brooklyn Ave., Kansas City, Mo. (Dolson).

Engle, A.—1103 Carson St., Pittsburg, Pa. Garage.

Englewood Auto Livery.—639 W. 63rd St., Chicago, Ill. Garage.

Engley, W. A.—Treas. Attleboro Automobile Co., 74 Union St., Attleboro, Mass.

English & Mersick Co.—New Haven, Conn. Mfrs. watch holders, lamps, name plates, top fixtures, metal trimmings.

Englund, J. A.—Kenmare. N. D. (Buick).

Ennes, J. M.—Princeton, Ill. Garage and repairing.

Ennis & Gavin.—14 Martin Ave., White Plains, N. Y. (Reo).

Ennis Geo. H.—215 Currier Bldg., Los Angeles, Cal. (Moon.)

Enos & Titterington.—Jerseyville, Ill. (Holsman).

Enrico, Sig.—Engineer and Designer, with Sig. Fornaca, of the Fiat Automobile Co., Turin, Italy.

Enterprise Foundry Co.—Detroit, Mich. Mfrs. brass, bronze, copper, aluminum and gray iron castings.

Enterprise Garage.—316-20 Washington St., Easton, Pa. Garage.

Enterprise Machine Works.—Cor. Park St. and Valley Ave., Spring Valley, Minn. (Reo).

Enterprise Machine Works.—308 N. 5th St., Richmond, Va. Mfrs. braziers.

Enterprise Rubber Co.—110 Federal

St., Boston, Mass. Mfrs. tire patches, tire plugs, miscellaneous wearing apparel.

Entrained.—A term applied to water that has been carried along with steam into the cylinder. See Priming.

Entrepôt Général d'Automobiles.—211 bdv. Pereire, Paris, France. Mfrs. automobile motors.

Entropy.—That property of a body which remains constant when there is no communication of heat, but which increases when heat enters and diminishes when it leaves the body. It is sometimes called the "thermodynamic function." The term has been erroneously used with the meaning of available energy.

Entz, Justus Buckley.—1st Vice-Pres. Electric Vehicle Co., Hartford, Conn. B.

New York June 16, 1867. Ed. private and public schools. College of City of New York. Mem. Germantown Cricket Club, Philadelphia, Huntingdon Valley Country Club, Philadelphia, Hartford A. C. Res. 869 Farm-



ington Ave., Hartford. In trade since 1897.

Eperson, F.—114 N. 11th St., La Crosse, Wis. (Pope-Waverley.)

Epicyclic Gear.—See Gear, Epicyclic.

Epicycloid.—A curve generated by any point of a circumference rolling without sliding upon another circumference, externally or internally.

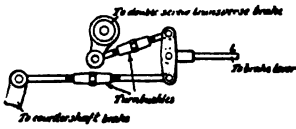
Eppelman, Geo. C.—Altoona Motor Car Co., 78 Green Ave., Altoona, Pa.

Equalizer.—A device for rendering uniform the pull on two levers, as on the hub-brakes of an automobile. It consists of a floating bar at each end of which is attached a cable or rod connecting with the hub-brake, and, in the cen-



ter, to the pull-rod from the hand-lever or brake-pedal. A pull on the rod will equalize that on each hub-brake. Another form has a tube connected at one end to the hub-brake, and to a rocker at the other. There is one tube to each side. A pull-rod is provided with a grooved roller over which passes a cable, each end going to the rocker at the end of the above-mentioned tube. A pull on the rod equalizes that on the tubes

through the intermedium of the cable running in the grooved pulley. The tubes



and bar may be dispensed with if the cables to the hub-brakes run over suitable rollers or grooves. Equalizing the pull on the brakes tends to prevent side-slip, etc.

Equilibration.—Same as balancing, q. v.

Equilibrium.—The condition of two or more forces which, when acting together on a body, produce no motion. "Neutral equilibrium" is the condition of a body when in equilibrium which is neither stable nor unstable.

Erb, John.—345 Bridge St., Phoenixville, Pa. Garage.

Erd Motor Co.—Saginaw, Mich. Mfrs. gasoline and marine motors.

Erg.—The C. G. S. unit of work. It is the amount of work done when a force of one dyne is overcome through a distance of one centimetre. Its synonym is the "dyne-centimetre."

As the "erg" is a very small quantity, the "megerg" (1,000,000 ergs) is most often employed. In practice the "kilogrammetre" (kgm.) is used.

The "erg per second" is the C. G. S. unit of power. It is the power produced by one dyne acting through a distance of 1 cm. in 1 second. The megerg per second is equal to 1,000,000 ergs per second.

Ericka Mfg. Co., Inc.—Springfield, Mass. Mfrs. hand soaps.

Erickson, Louis.—1520 Belmont Ave., Seattle, Wash. (Dragon.)

Erie Forge Co.—Erie, Pa. Mfrs. connecting rods, crank shafts.

Erie Foundry Co.—Erie, Pa. Mfrs. gray iron castings.

Erie Motor Club.—W. O. Davis, Sec., Erie, Pa.

Erie Stamping & Mfg. Co.—646 W. 12th St., Erie, Pa. Mfrs. oil and grease cups. Cap. \$50,000. Est. 1903. Alfred Thompson, Pres.; Arthur Thompson, Vice-Pres.; W. H. F. Nick, Sec. and Treas.

Erlin, Geo. E.—Vice-Pres. Reliance Automobile Co., 547-57 Fulton St., San Francisco, Cal.

Ernesto Ciocca del fu Giacinto.—22 via Parma, Turin, Italy. Mfrs. bodies.

Ernst's Sons, C. F.—75 Lathrop St., Buffalo, N. Y. Mfrs. turntables.

Erskine & Hall.—S. Orange, N. J. (Rambler).

Erste Amsterdamsche Bandenfabriek, W. de Koff.—3 Helmerstraat 25, Amsterdam, Holland. Mfrs. pneumatic tires.

Escalante é Hijo.—E. Calle 63 No.,

Merida, Yucatan, Mex. (Ford, Maxwell).

Escanaba Cycle Works.—1011 and 602 Ludington St., Escanaba, Mich. (Rambler).

Eschinger, E. A.—715 E. 13th St., N. W., Washington, D. C. Repairing.

Español-Suiza, Sociedad Anonima.—54 calle Florida blanca, Barcelona, Spain. Mfrs. gasoline automobiles (Birkigt cars); marine and automobile motors.

Essex Auto Co.—518 Broad St., Newark, N. J. (Jackson).

Essex Automobile Co.—Oxford Garage, 197 Broad St., Lynn, Mass. (Ford).

Essex Brass Co., G. B.—480-6 Franklin St., Detroit, Mich. Mfrs. lubricators, grease pumps and oil syringe. Cap. \$45,000. Est. 1901. G. Bert Essex, Pres., Treas. and Mgr. Mfg. Dept.; L. E. Essex, Vice-Pres.; R. T. Gray, Sec. Agents: Auto Supply Co., Chicago, Ill.; Chanslor & Lyon Motor Supply Co., Los Angeles, Cal.; Chas. E. Miller, New York City; Neustadt Auto & Supply Co., St. Louis, Mo.

Essex Engine Co.—416 Union St., Lynn, Mass. Mfrs. marine gasoline engines. W. J. Young, Treas. and Gen. Mgr. Agents: Burns Motor Exchange, Jersey City, N. J.; J. King & Co., 119-125 Three Colt St., Limehouse E., London, England.

Essex, G. Bert.—Pres., Treas. and Mgr. Mfg. Dept. G. B. Essex Brass Co., 480-86 Franklin St., Detroit, Mich.

Essex, L. E.—Vice-Pres. G. B. Essex Brass Co., 480-86 Franklin St., Detroit, Mich.

Essex Motor Car Co.—60 State St., Boston, Mass. Mfrs. steam automobiles.

Esswein, Sam. A.—24 W. Broad St., Columbus, O. Garage.

Etablie Frères et Louis Etablie.—13 quai Valmy, Paris, France. Mfrs. radiators.

Estep, Edwin Ralph.—Adv. Mgr. Packard Motor Car Co., Detroit. B. Rantoul, Ill., Aug. 16, 1876; ed. High school. Mem. Chicago A. C. Office, Detroit, Mich. In trade since 1897.

Esterbrook, Ernest.—Mgr. Sporting Goods Dept., S. L. Crosby Co., 186 Exchange, Bangor, Me.

Estes, J. D.—Treas. W. R. Demster Mch. Co., N. W. cor. 16th and Walnut Sts., Kansas City, Mo.

Esty & Page.—Amherst, Mass. Dist. for Commonwealth Rubber Co., for New England, Pennsylvania, Indiana and Michigan.

Esty, Wm.—59 Mill St., Laconia, N. H. Mfr. steam engines.

Etablissements Peltier et Thuault.—7 ave de Robinson, Sceaux-Robinson, Seine, France. Mfrs. elastic wheels.

Ether, Sulphuric.—The ethers of alco-

hol are numerous (nitric, hydrochloric, acetic, etc.) "Sulphuric ether" is ethyl oxide ($C_2H_5)_2O$, obtained by the action of sulphuric acid on alcohol at $284-293^{\circ}F$, or $140-145^{\circ}C$.

Sulphuric ether is used in automobilism as an adjuvant in solutions of rubber. It has been proposed as a carburant for internal combustion motors. It has a calorific value of 8000. It can be used in winter for obtaining the preliminary "explosions" for starting. It boils at about $93^{\circ}F$, or $34^{\circ}C$.

Ethyl Alcohol.—See Alcohol.

Ettwine Motor Car Co.—5701 Main St., Kansas City, Mo. (Aerocar, Stoddard-Dayton, Welch).

Euclid Auto Exchange & Livery.—5017 Euclid Ave., Cleveland, O. Garage.

Euclid Garage.—10636 Euclid Ave., Cleveland, O. (Pungs-Finch, Compound).

Euclid Garage Co.—Euclid Ave., Upland, Cal. (Gale, Jackson).

Eudelin, M.—Joinville le-pont, Paris, France. Mfrs. gasoline automobiles (Eudelin cars).

Eureka Auto Agency.—2285 8th Ave., New York City. Garage.

Eureka Motor Co.—1409-11 Broadway, Seattle, Wash. (Dolson, American Mors).

Eureka Mower Co.—Utica, N. Y. Mfrs. jacks.

Eureka Nut Lock Co.—32nd and Smallman Sts., Pittsburgh, Pa. Mfrs. patent nut locks.

Eureka Pneumatic Spray Co.—92 Lafayette Ave., New York City. Mfrs. air compressors.

Eureka Spring Co.—347 Broadway, New York City. Mfrs. machinery springs.

Eureka Supply Co.—230 Broadway, Buffalo, N. Y. Supplies.

Eureka Tempered Copper Works.—Northeast, Pa. Mfrs. brass, bronze, aluminum and copper castings.

Eustace, E. J., Jr.—46 119th St., Whiting, Ind. Repairing.

Eustia, J. R.—Adv. Mgr. Palmer & Singer Mfg. Co., 1620-24 Broadway, New York City.

Euston Motor Co., Ltd.—124 Euston Road, London, England. Mfrs. gasoline automobiles (Courier cars).

Evans Automobile Co.—63 Fay St., Columbus, O. Garage.

Evans, C. C.—Pres. Evans Motor Car Co., Minneapolis, Minn.

Evans, C. W.—Dixon, Ill. (Northern).

Evans, Ellicott.—Sec. E. R. Thomas Motor Co., 1200 Niagara St., Buffalo, N. Y.

Evans, Fred. F.—Pres. Puget Sound Auto Co., 1405-7 Broadway, Seattle, Wash.

Evans, F. T.—136 S. Pittsburg St., Conellsville, Pa. (Rambler).

Evans, M. E. H. O.—Head Draughtsman J. E. Lonergan & Co., 211-15 Race St., Philadelphia, Pa.

Evans, H. O.—Mech. Eng. and Head Draughtsman J. E. Lonergan & Co., 211-215 Race St., Philadelphia, Pa.

Evans, J. P.—Sec. MacFarland Powell Auto Co., Denver, Colo.

Evans Mfg. Co.—118 N. Brookline St., Boston, Mass. Mfrs. bow separators, top fixtures.

Evans Motor Car Co.—522 S. 10th St., Minneapolis, Minn. (Jewell, Wayne, Mitchell). Cap. \$50,000. Inc. C. C. Evans, Pres. and Treas.

Evans, O. J.—Foreman W. H. & L. C. Wolfe, 1011 Chestnut Ave., Altoona, Pa.

Evansville Automobile Co.—Evansville, Ind. Makers of the Simplicity car. J. C. Zutt, Pres.; A. F. Karges, Vice-Pres.; W. M. Copeland, Sec. and Treas. Agents and dealers: Fitch Auto Co., 410 S. Main St., Los Angeles, Cal. Pitman Nelson Auto Co., Berkeley, Cal.

Evansville Battery & Electrical Co.—Evansville, Ind. Mfrs. storage batteries, gasoline automobiles.

Evaporation.—The process by which a liquid changes into a gas or vapor. Evaporation takes place slowly in the open air, owing chiefly to atmospheric pressure. If the pressure be partially removed, it will occur instantaneously, like the flash of gunpowder, especially if the liquid is very volatile. The principal causes which influence the amount and rapidity of evaporation are: Pressure, increased surface, increased temperature diminished quantity of vapor in the air, and renewal or circulation of the air over the fluid.

Evarts, Chas. O.—Pres. Puncture Proof Tire Co., Schofield Bldg., Cleveland, O.

Eveland, Frank.—Automobile dealer. B. Newark, N. J., March 14, 1860. Mgr. A. G. Spalding & Bros., New York and Philadelphia. V. Pres. N. Y. Auto Trade Association. Mem. A. C. A. V. Pres. Jersey City A. C. Res. 220 W. 49th St., New York. Office 29 W. 42nd St., New York. In trade since 1898.

Eveland, Winsor F.—Mgr. A. G. Spalding & Bros., branch, 336 N. Broad St., Philadelphia, Pa.

Eveno, A.—22 ave. de Neuilly, Neuilly, Paris, France. Mfr. carburettors.

Everest, J. H.—Lee Bldg., Oklahoma City, Okla. Garage.



Everett Automobile Co.—148 N. Ionia St., Grand Rapids, Mich. (Gale).

Everett, B. F.—Detroit, Mich. Mfr. dashes and fenders, automobile tops, cloth and carpet trimmings.

Everhart, H. C.—Taylorsville, N. C. (Maxwell).

Everitt, B. F.—Pres., Gen. Mgr. and Director Wayne Automobile Co., Piquette and Brush Sts., Detroit, Mich.

Eves, J.—Millville, Pa. (Cadillac.)

Excelsior Auto Co.—133 W. 32nd St., New York City. Garage.

Excelsior Auto Repair Station.—3925 Michigan Ave., Chicago, Ill. Garage.

Excelsior Carriage Co.—Main St., White River Junction, Vt. (Cadillac, Buick, Stanley). Jobbers and dealers in automobile supplies. Est. 1889. Cap. \$50,000. Geo. B. Massey, Pres.; H. R. Miller, Vice-Pres.; John M. Carpenter, Sec. and Treas. Garage 10 to 15 cars. Repairing.

Excelsior Fahrradwerke Actien Gesellschaft.—Brandenburg, Germany. Mfrs. motorcycles.

Excelsior Motor & Mfg. Co.—233-237 Randolph St., Chicago, Ill. Auto-cycle.

Excelsior Poultry & Provision Co.—69 Franktown Ave., Pittsburg, Pa. (Walsham).

Excelsior Spark Plug Co.—Cleveland, O. Mfrs. spark plugs.

Excelsior Steel Ball Co.—Military Rd., Buffalo, N. Y. Supplies.

Excelsior Supply Co.—233-7 Randolph St., Chicago, Ill. Supply house.

Excitation.—The magnetizing of the field magnets of a dynamo or motor by the passage of a current through the coils of wire on the limbs or cores of the magnets. The current is obtained either from the machine itself in self-exciting dynamos or is supplied from a separate source in separately excited dynamos.

Exhaust.—The period in which the burnt gases are discharged from the cylinder of an internal combustion motor, the fourth stroke of a four-cycle motor. To eliminate the noise of this discharge it is carried to a muffler *q. v.* The exhaust-ports should be sufficiently large to avoid any possible back-pressure. (2) The burned gases or expanded steam discharged from an engine after performing their work in the cylinder.

Exhaust-box.—The same as Mufflers, *q. v.*

Exhaust-pipe.—See Pipe, Exhaust.

Exhaust-stroke.—In a gasoline motor, the stroke during which the discharge of burned gases takes place.

Exhaust-valve.—See Valve, Exhaust.

Exothermic.—A term applied to compounds in the formation of which, from their elements, heat is evolved.

Expander.—A tapering tool employed for expanding tubes.

Expanding Brake.—See Brake, Expanding.

Expanding Clutch.—See Clutch, Expanding.

Expanding Metal.—Alloys of bismuth, which have the property of expanding on solidifying. See Bismuth.

Expanding Pulley.—See Pulley, Expanding.

Expansion.—The expansion of a gas or vapor is the diminution in pressure accompanying its increase in volume. The consideration of expansion is of prime importance in the study of thermic motors, such as steam-engines, internal combustion-motors, etc. Up to a certain limit the increase of expansion is a cause of increase of efficiency.

In steam-engines, the calorific efficiency is, in fact, defined by the formula

$$\text{of the Carnot cycle, viz.: } R = \frac{T_1 - T_2}{273 + T_1}$$

The value of *R* is so much greater in proportion as the difference *T*₁*T*₂ between the temperatures of the steam at the entrance into and exit from the engine is greater. It is possible to increase such difference by diminishing *T*₂ or increasing *T*₁. Now, *T*₂, the temperature of the condenser, is scarcely capable of diminution. It is therefore necessary to augment *T*₁ by increasing the pressure and especially by superheating the steam employed; and, in order to utilize all the expansive force, to bring about a sufficient expansion to lower the final temperature in the cylinder to *T*₂ or thereabout. Practice has demonstrated, however, that the running of the engine is not so much the more economical in proportion as the pressure is higher and the expansion greater. The influence of dead and cooling spaces is the cause of this; and so, beyond a certain expansion, the consumption of steam increases. The use of engines with successive expansions in several cylinders permits of high pressures and great expansions, in reducing the difference between the initial and final temperatures in the same cylinders, and consequently the extent of the condensations at the admission. All things equal, moreover, the operation of such engines is more economical than that of single cylinder ones.

In internal combustion motors the expansion is generally sufficient to lower the pressure to a value bordering on that of the atmosphere. The efficiency will therefore be increased by the obtaining of a high initial temperature requiring a strong preliminary compression. Such preliminary compression, in fact, produces an increase of the temperature of the gases favoring the rapidity of ignition, which should be instantaneous, that is to say, under a constant volume, if it

is desired to obtain a maximum efficiency, and, on the other hand, increases the pressure and the temperature nearly proportionally, in the cycle of four-period operation, the expansion may be increased by diminishing the pressure of admission, which amounts to the same thing as diminishing the admission-stroke with respect to the expansion stroke, but without there resulting therefrom a lowering of the compression. This is essential. In the Diesel cycle the expansion is variable and may become considerable. It operates in a manner analogous to that of steam-engines. See Steam, Carnot and Diesel Cycles. Any increase in the dimensions of a body, particularly the increase in volume of steam or other gases in a cylinder after the admission of steam has ceased, or after the charge in a gasolene motor has been fired. The explosion in the latter is not instantaneous, but is practically continuous through the stroke. At the moment of ignition the pressure is greatest, but the gases formed expand under the influence of the heat until the exhaust-valve is opened, and expansion is continued in the muffler. Thus, a fairly large part of the force of the expansion is not utilized.

Expansion Gear.—See Gear, Expansion.

Expansion Joint.—See Joint, Expansion.

Expert-Bezançon.—17 rue du Chateau-des-Rentiers, Paris, France. Mfrs. storage batteries.

Explosion.—A generally accepted, but

erroneous term for the powerful expansion of heat in the cylinder of a gasolene motor following the quick combustion of the mixture of gas and air compressed therein. (2) The destruction of a boiler through the pressure of the steam becoming too high.

Explosion, Crank-case.—See Back-firing.

Explosion Engine.—Same as Internal Combustion Motor.

Explosion, Muffler.—See Back-fire.

Exponent.—A figure indicating the power to which a number is to be raised. This is written in small characters at the upper right hand of the number. Thus, $10^3 = 10 \times 10 \times 10 = 1000$, and $(45.3)^2 = 45.3 \times 45.3 = 2052.09$.

Express Fahrradwerke Actien Gesellschaft.—Neumarkt, Nürnberg, Germany. Mfrs. motorcycles, gasolene automobiles (Express cars).

Extra Current.—See Current, Extra.

Eye.—A hole in any mechanical device, such as a wheel, crank, hammer, etc., for the insertion of a shaft, pin, ring or handle.

Eyke, C. V.—Vice-Pres. and Sec. The W. R. Demster Machinery Co., 16th and Walnut Sts., Kansas City, Mo.

Eymard et Cie.—19 rue Copernic. Paris, France. Mfrs. pneumatic rubber tires.

Eyre & Co.—Grosvenor Gardens, St. Leonard, Sussex, England. Mfrs. non-skids.

Eysink, D. H.—Amersfoort, Holland. Mfr. gasolene automobiles.

Ezell Automobile Co.—Nashville, Tenn. Garage.

F

F.—Abbreviation of "farad" and "force."

Fe.—The symbol for "iron."

F. R. V. Auto Parts Co.—116 Nassau St., New York City. Shock absorbers.

Fabbrica Automobili Standard.—20 corso Siccardi, Turin, Italy. Mfrs. gasoline automobiles. (Standard cars.)

Fabbrica di Automobili Florentia.—Via Ponte al-l'Asse, Florence, Italy. Mfrs. gasoline automobiles and gasoline commercial vehicles. (Florentia cars); automobile motors.

Fabbrica Italiana Automobili di Torino.—35 corso Dante, Turin, Italy. Mfrs. gasoline and gasoline commercial automobiles and marine motors. (Fiat cars.)

Fabbrica ligure di Automobili di Genova.—2 piazzetta Corvetto, Genoa, Italy. Mfrs. gasoline automobiles, gasoline commercial vehicles. (F. L. A. G. cars); marine motors.

Fabbrica Riuniti di Carrozzeria, C. Castagna e Co.—19 via Montevideo, Milan, Italy. Mfrs. bodies.

Fabel, Aug.—First vice-pres. and treas. American Oak Leather Co., Kenner St. and Dalton Ave., Cincinnati, O.

Faber & Co., Wm.—Oshkosh, Wis. (Cartercar.)

Fabric.—The woven or interlaid threads commonly employed in the construction of pneumatic tires.

Fabrik Elektrischerapparate, Dr. Max Levy.—Chausseestrasse 2, Berlin, Germany. Mfrs. coils.

Fabrique de Moteurs Zedel, Société Anonyme.—Pontarlier (Doubs), France. Mfrs. automobile motors.

Fabrique Nationale d'Armes de Guerre.—Herstal-lez-Liege, Belgium. Mfrs. gasoline automobiles. (F. N. cars.)

Face.—The working surface of a gear-tooth beyond the pitch-line; the striking surface of a hammer; the edge of a cutting-tool, etc.

Face-mask.—A mask worn by automobilists for protecting the face and eyes from dust and wind.

Face-plate Coupling.—See Coupling. Face-plate.

Fagoting.—In forging, the consolidation, under a power hammer, of several bars of iron, hooped together and raised to a welding heat; a method of work adopted for the production of a very

fibrous iron of great tensile strength for the manufacture of spindles, shafts, and other parts of ordinary machinery.

Fahrig Metal Co.—316 Hudson St., New York City. Mfrs. babbitt metal.

Fahrzeug, Das.—Published at Eisenach, Germany.

Fahrzeugfabrik Eisenach.—Eisenach, Germany. Mfrs. gasoline commercial automobiles. (Dixi delivery wagons); gasoline automobiles. (Eisenach and Dixi cars.)

Fair Bros.—1908 7th Ave., Beaver Falls, Pa. (Jackson.)

Fairbank, Dexter.—Sec. and treas. Casady Fairbank Mfg. Co., 6106-30 La Salle St., Chicago, Ill.

Fairbanks-Grant Mfg. Co.—Ithaca, N. Y. Mfrs. gasoline automobile and marine motors; motor boats; garage.

Fairbanks, Morse & Co.—Franklin and Monroe Sts., Chicago, Ill. Mfrs. Fairbanks-Morse motor boats, first marketed in 1900. Over 20 different models made since. Capital, \$1,000,000. C. H. Morse, pres.; W. E. Miller, first vice-pres. and gen. mgr.; H. C. McClary, second vice-pres.; H. M. Hollister, treas.; F. M. Boughey, sec. and auditor; S. F. Forbes, pur. agt.; A. G. Langworthy, adv. mgr.

Fairchild & Bro., M. H.—119 Michigan St., Chicago, Ill. Mfrs. metal polishes and automobile body soaps.

Fairchild, Frank.—Sherburne, N. Y. Garage.

Fairchild, H. Coulson.—Passaic, N. J. Garage.

Fairfield Motor Co.—172 Cannon St., Bridgeport, Conn. Mfrs. electric and gasoline marine motors.

Fairfield Rubber Co.—Fairfield, Conn. Mfrs. rubber cloth.

Fair-leader.—A thimble used on vessels for guiding a rope. See Thimble.

Fair Oak Garage.—Pasadena, Cal. (Rambler.)

Fake, Ed. D.—18 E. Clark St., Ilion, N. Y. Garage.

Falcon Motor Works.—114 Wick Ave., Youngstown, O. (Baker.)

Falconnet-Perodeaud.—Choisy-le-Roi (Seine), France. Mfrs. solid and pneumatic rubber tires.

Fall.—
which power is applied. See Pulley.

Fall River Auto Co.—345 Durfee St., Fall River, Mass. (Stanley.)

False Frame.—Same as Sub-frame. See Frame (1).

Fan.—A rotary apparatus consisting of from four to twelve helical blades of a light metal mounted on a boss, running on ball bearings, and driven by the

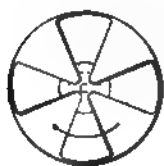


Fig. 1

motor through spur-gear, a wire belt, or a V-shaped, round or flat leather belt. (Fig. 1). It is used for cooling an air-cooled motor by increasing the circulation of air around the cylinders and, in a water-cooled motor, by drawing air through the radiator.



Fig. 2.

In another system, the fly-wheel arms are cast in such a shape (Fig. 2) as to form the blades of a fan; and, in still another, vanes, heli-

cally arranged, are secured to the periphery of the wheel.

Fancher & Morris.—Salt Lake City, Utah. (Maxwell.)

Fancher, Sayer.—21 Cottage St., Middletown, N. Y. (Lambert.)

Fang-bolt.—See Bolt, Fang.

Fanning Tire Co.—1470 Michigan Ave., Chicago, Ill. Tires and tire repairing.

Farad.—The electromagnetic unit of capacity. The practical unit adopted is the one millionth part of a farad, and is termed a "microfarad." This is about the capacity of three nautical miles of submarine cable.

Farcot Frères et Cie.—St. Ouen, France. Mfrs. automobile motors.

Fargo Auto Brokerage & Garage Co.—302 Broadway, Fargo, N. D. Garage.

Farhsworth & Glidden.—25 Euclid St., Rochester, N. Y. (Welch.)

Farout, Charles Ernest.—16 Rue Bachaumont, Paris. Born at Noyon, December 20, 1873. Editor of L'Auto. Educated at the Polytechnic School. Doctor of Mathematical Sciences. Formerly engineer to the Compagnie Générale des Omnibus; chemist at the Sacramento gold mines; engineer of the Milwaukee street railways, and consulting engineer, etc.



Farr, F. G.—Vice-pres. and mgr. Hydraulic Oil Storage Co., 820 Penobscot Bldg., Detroit, Mich.

Farr, H. G.—Sec. and supt. Knox Automobile Co., Springfield, Mass.

Farré, J.—179 calle Aragon, Barcelona, Spain. Mfrs. bodies.

Farrington, B. W.—Perth Amboy, N. J. (Waltham.)

Farrington, C. A. W.—Vice-pres. Automobile Owners' Supply Depot, 1655 Broadway, New York City.

Farrington, George Edward.—Treasurer A. A. A. and banker. B. Boston, Mass., April

6, 1871. Ed. Boston High School. Member Clubs: Union League (N. Y.), Lawyers (N. Y.), Essex Co. (Mass.), Country, Orange (N. J.) Res., 17 New England Terrace, Orange, N. J. Office, 36 Nassau St., New York. Used first



car 1900. Recreations, all outdoor sports, fishing and shooting.

Farry, A. J. G.—216 W. Main St., Madison, Ind. Garage.

Farson, John.—Lawyer. B. Union City, Ind., Oct. 8, 1855. Ed. public schools and Univ. of Ill., '76. Studied law in Chicago, admitted to bar 1880.

Org. firm of Farson, Leach & Co. in 1889, since changed 1906, to Farson Son & Co. Director Rockford and Interurban Ry. Co., Rockford & Freeport Ry. Co., Evansville Gas & Elec. Co. Pres. American Automobile Association. Vice-Pres.



Nat. Good Roads Ass'n. Mem. clubs: Chicago, Chicago Athletic, Chicago A. C. (Pres.), Chicago Yacht, Midday, Bankers. Illinois, Union League, Glen View Golf, Lawyers (Y. Y.), Oak Park. Res., Oak Park, Ill. Office, First Nat. Bank Bldg., Chicago, Ill., and 34 Pine St., New York City.

Farwell, F. O.—Gen supt. The Adams Co., Dubuque, Ia.

Fashion Auto Station.—4612 Cottage Grove St., Chicago, Ill. Garage.

Fashionable House.—16 bd. Montmartre, Paris, France. Mfrs. wearing apparel; coats.

Fashion-pieces.—The hindmost tim-

bers in the run of a vessel which terminate the breadth, and form the shape of the stern.

Fassitt, T.—Mgr. Easton Auto Co., 41 Delaware St., Easton, Pa.

Fast, Otto.—Greenfield and 25th Sts., Milwaukee, Wis. Mfrs. carburetters.

Fast Pulley.—See Pulley.

Fastener.—A device for fastening together the ends of driving-belts.

Fathom.—A measure used by sailors, and equal, approximately, to 6 feet.

Fatigue, Elastic.—A falling off in value of the elasticity of a body after it has been subjected to a long continued stress.

Faulkner & Bowers.—Troy, O. (Reo.)

Fault.—A weak spot in the insulation of the wires or other part of an electric circuit allowing leakage, or a broken connection preventing the passage of electricity.

Faurax et Cie.—La Jonction, Geneva, Switzerland. Mfrs. bodies.

Faure, Jacques.—32 Rue Washington, Paris. Born at Bellevue in 1873. After a residence in England, where he developed a taste for athletic sports (yachting and motor-boating), of which he was a brilliant champion, he gained, as an aeronaut, a well deserved celebrity. He obtained magnificent results in the competition at the Exposition of 1900, where he succeeded in classing himself third in the tests as a whole. He made four balloon trips from England to France (three in 1905), the most remarkable of which was from London to Paris in 6h. 30m. (Feb. 10, 1905). He won the first Grand Prix of the Aero Club of France, Paris-Kirchdrauf (Hungary), 1,314 kilometres, in 18h. 6m., on Oct. 15 and 16, 1905. By his boldness, his coolness, and his technical skill, M. Faure is one of the most brilliant representatives of the French school of aerostation.

Faurote, Fay Leone.—Advertising manager E. R. Thomas Motor Co. B. Terre coupe, Ind., July 26, 1881. Ed.

Niles High School (graduate 1899). Received degree B. S. (M. E.) at the University of Michigan, 1908. Mem. Aircraft Club of Detroit. Employed by Olds Motor Works July, 1903, to Jan. 1, 1908. Author of "A Busy Man's Text Book on Automobiles," "The

Howland Why of the Automobile," and "A Boy's Text Book on Gas Engines."

Fawcett, C. E.—119-121 3d Ave., Cedar Rapids, Ia. (National.) Est. 1886. C.

E. Fawcett, sole owner. Garage; 20 cars; repairing; supplies.

Fawkes Auto Co.—202-6 W. 6th St., St. Paul, Minn. (Holsman, National, Rambler, Glide.)

Fawkes Auto Co.—111 S. 6th St., Minneapolis, Minn. (Holsman, National, Rambler, Glide.)

Fawn River Mfg. Co.—Constantine, Mich. Mfrs. magnetos and ignition dynamos.

Faxon, E. R.—Sec. The Mutual Machine Co., 25 Wells St., Hartford, Conn.

Fay & Bowen Engine Co.—92 Lake St., Geneva, N. Y. Mfrs. gasoline marine motors, kerosene motors and motor boats.

Fay & Scott.—Dexter, Me. (Reo, Maxwell.) Machine tool builders; garage, 10 cars; repairing.

Fay, C. A.—210 6th Ave., Clinton, Ia. (Reo.)

Fay, Owen H.—243 Michigan Bvd., Chicago, Ill. (Elmore.)

Fayette Automobile Co.—76 E. Fayette St., Uniontown, Pa. (White, Peerless, Reo, Holsman, Winton.) Est. 1902. Garage, 50 cars; repairing.

Feather.—A slip inserted longitudinally into a shaft and projecting as a fin so as to fit a groove in the eye of a wheel, which may thus have a longitudinal, but not a rotary motion. (2) A longitudinal rib formed on a shaft or on the arm of a gear-wheel in order to strengthen it (3) The angular adjustment of a propeller-blade.

Feather, Sliding.—A feather formed integral with a wheel and sliding into a slot in the shaft.

Featherstone, J. E.—Aurora, Mo. (Holsman.)

Fedders Mfg. Co.—57-59 Tonawanda St., Buffalo, N. Y. Mfrs. auto radiators, tanks, hoods, etc. Est. 1897. Theo. C. Fedders, proprietor.

Fedders, Theo.—Proprietor Fedders Mfg. Co., 57-59 Tonawanda St., Buffalo, N. Y.

Federation Aeronautique Internationale.—84 Faubourg St., Honoré, Paris, France. Georges Besancon, sec. An association composed of the following clubs: Aero Club of America, Aero Club de France, Deutscher Luftschiffer-Verband, Aero Club de Belgique, Real Aero Club de Espana, Aero Club of the United Kingdom, Societa Aeronautica Italiana, Aero Club Suisse.

Federation of American Motorcyclists.—R. G. Betts, pres., 154 Nassau St., New York City. Organized Sept. 7, 1903. Objects: "To encourage the use of motorcycles and to promote the general interests of motorcycling; to ascertain, defend and protect the rights of motorcyclists; to facilitate touring; to assist in the good roads movement, and to govern and ad-

minister the sport of motorcycle racing and other competitions in which motorcycles engage." Henry J. Wehman, sec., 108 Park Row, New York City; G. B. Gibson, treas., 24 Main St., Westboro, Mass. Vice-presidents: For Eastern District, Theodore K. Hastings, 118 Nassau St., New York City; for Southern District, Howard A. French, 304 W. Baltimore St., Baltimore, Md.; for Western District, Irving R. Hall, 200 S. Oak Park Ave., Oak Park, Ill.; for Pacific District, Frank M. Byrne, 901 Eddy St., San Francisco, Cal.

Fee & Stewart Co.—Ft. Pierce, Fla. (Waltham.)

Fee-Bock Auto Co.—254 Jefferson Ave., Detroit, Mich. (Elmore, Woods.)

Fee Motor Car Co.—Detroit Mich. Mfrs. gasoline automobiles.

Feed.—In a motor-car, the supply of gasoline to the motor. (2) In a steam-car, the supply of water to the boiler, or of fuel to the burner.

Feed, Float.—See Float, Feed.

Feed-pipe.—The pipe which conveys water to a steam boiler.

Feed-pump.—A small pump, called a "force" or "plunger-pump," which forces water into a steam boiler.

Feed, Sight.—A lubricator in which oil is fed drop by drop in a transparent portion of the apparatus. See Lubricator, Sight-feed.

Feed-tank.—See Tank.

Feed-water.—The water supplied to a steam boiler. By measuring its amount, the quantity of steam generated in a given time may be found.

Feed, Water.—A term applied to acetylene generators in which water is dripped on the carbide.

Feed-water Heater.—A device for warming feed-water, usually by means of the exhaust steam or by the condenser.

Feick, Wm. G.—Garage. Mgr. Parkway Garage Co., Central Park West and 110th St., New York City.

Feine, August.—152 Terrace St., Buffalo, N. Y. Mfr. bolts and rods.

Feld, Carl.—Wald, Rheinland, Germany. Mfr. non-skids.

Feldmeir, Harvey.—Little Falls, N. Y. (Franklin.)

Felker Automobile Co.—1535 Tremont St., Denver, Colo. (Stevens-Duryea, Waltham, Pope-Waverley.) Est. Jan., 1900. Garage, 65 cars; repairing.

Felloe or Felly.—A segment of the rim of a wooden wheel; also, in familiar language, the entire rim.

Fellows & Fay.—126 Central Ave., Dunkirk, N. Y. Garage.

Fellwock Automobile & Mfg. Co.—Evansville, Ind. Office, salesroom and garage, 320-322 Upper 4th St. Factory, 210 E. Pa. St. (Maxwell, Mitchell, Stoddard-

Dayton, National, Baker, Ford.) Mfrs. wood and metallic bodies, automobile seats, tops, turntables, glass windshields. Est. 1906. Capital, \$20,000 authorized; \$12,000 paid in. W. E. Fellwock, pres and sales mgr.; J. F. Fellwock, vice-pres. and head of mfg. dept.; P. B. Fellwock, sec. treas. and gen. mgr. Garage, 30 cars; repairing.

Fellwock, J. F.—Vice-pres. Fellwock Auto & Mfg. Co., 320-322 Upper 4th St., Evansville, Ind.

Fellwock, P. B.—Sec. and treas. Fellwock Auto & Mfg. Co., 320-322 Upper 4th St., Evansville, Ind.

Fellwock, W. E.—Pres. and sales mgr. Fellwock Auto & Mfg. Co., 320-322 Upper 4th St., Evansville, Ind.

Felske, Chas.—Supt. Apperson Bros Automobile Co., Kokomo, Ind.

Felt.—A thick woolen fabric made without weaving; used in some motors as a wrapping for certain members in order to deaden the sound made by their vibrations; or as a lining for gear-boxes, in certain electric vehicles, for suppressing the noise made by the gearing. It is also used for making washers for the spring separators which hold apart the balls in the races of ball bearings.

Feltham, Arthur J.—Providence, R. I. (Cadillac.)

Felton, Sibley & Co.—136-140 N. 4th St., Philadelphia, Pa. Mfrs. enamel, paints, varnishes.

Female Screw.—The same as Nut, q. v.

Fend, R. S.—Supt. Electric Automobile Department Columbus Buggy Co., Dublin Ave. W., Columbus, O.

Fender.—A metal or other guard fixed to the sides of a car in order to prevent mud picked up by the road-wheels from being splashed over the car and its occupants. It is suspended by specially shaped brackets or hangers at a sufficient distance above the wheel to allow for the rise of the axle. The fenders are



connected to the foot-board of the car, in order to further prevent

the splashing of mud. (2) A device consisting of a rope plaiting, a bag stuffed with ground cork, etc., hung against a boat's side in order to prevent injury due to striking against a pier, another vessel, etc.

Fenker, Richard H.—Sec. and treas. Parkway Garage Co., Central Park W. and 110th St., New York City.

Fenn Bros.—122-124 E. 10th St., Sioux Falls, S. D. (Packard, Autocar, Buick.)

Fenner, F. H.—The Ridotto, 1009 Washington St., Bay City, Mich. (Jackson, Mitchell, Franklin.)

Fenner, F. N.—Marquette, Mich. (Caddillac.)

Fenske, H., Wagenbau-Anstalt.—Reinickendorferstrasse 78, Berlin, Germany. Mfrs. bodies.

Ferguson, August Lincoln.—Automobile designer and constructor. B. Boston, Mass., Aug. 27, 1865. Ed. Boston Grammar and High schools. Contributor to automobile publications from 1896 on. Founding editor of Motor Vehicle Review in Cleveland, O., Sept. 5, 1899.

Ferguson, B.—Orion, Ill. (Waltham.)

Ferguson, C. W.—Pres and treas. Connecticut Steel & Wire Co., 308 Pearl St., Hartford, Conn.

Fergusson, David.—Mechanical Engineer with G. N. Pierce Co., Buffalo, N. Y. B. Bradford, Eng., May 27, 1869. Ed. Bradford Grammar School and Bradford Technical College, graduating in 1888. From 1889 to 1896 occupied position as draughtsman and designer with prominent English engineering firms. Member A. C., of Buffalo; Society of



Automobile Engineers. Res., 286 Pennsylvania St., Buffalo, N. Y. In trade since 1897.

Ferguson Implement Co.—2105 E. 15th St., Kansas City, Mo. (Haynes, Gale.)

Ferguson, James.—Supt. The Safety Insulated Wire & Cable Co., 114 Liberty St., New York City. Factory, Bayonne, N. J.

Fernald Auto Co.—1548 Broadway Denver, Colo. (Maxwell, Auburn.)

Fernald, Geo. H.—North East, Pa. (Maxwell.)

Fernandez Smollera & Stevens.—Gualajajara, Mexico. (Compound.)

Fero, M. S.—Sec. Berkshire Cycle & Automobile Co., 95 Main St., North Adams, Mass.

Ferodowill Mfg. Co.—St. Paul, Minn. Mfrs. air compressors, jacks, tire pumps.

Ferre, E. E.—379 Washington, St., Buffalo, N. Y. Supplies.

Ferre, E. H.—Market St., Lockport, N. Y. Aluminum.

Ferrell, A. M.—Colby and California Sts., Everett, Wash. (Mason, Ford, National.) Est. March, 1907. Garage, 25 cars.

Ferres, John G.—118 W. Main St., Johnstown, N. Y. (Reo.) Supplies.

Ferretti, Alfredo.—151 via dei Fiori, Turin, Italy. Mfrs. circulating pumps.

Ferris, W. M.—Sales Dept., Park Sq. Auto Station, 43 Columbus Ave., Boston, Mass.

Ferro-aluminum.—An alloy of iron and aluminum, employed in metallurgy, for the refining of iron.

Ferro-chromium.—A ferro-metallic compound containing from 10 to 60 per cent. of chromium. Chromium, like tungsten, increases the elasticity and mechanical resistance of steel. Chromium-steels, obtained by the addition of ferro-chromium, have a tensile strength of 171,600 lbs. per square inch (120 kilogrammes per square millimetre).

Ferro-manganese.—The alloys of iron and manganese are special castings called "spiegels," when the content in manganese is not over 30 per cent.; "silico-spiegels" when the content of silicon and manganese is not over 36 per cent; and "ferro-manganese" when the content of manganese reaches 85 per cent. Ferro-manganese plays an important part in the metallurgy of iron. Manganese is, in fact, more oxidizable than iron and permits of the refining of it. It also prevents the formation of blow-holes. Manganese introduced into steel gives it special electrical and mechanical properties. Small quantities increase its resistance to traction, but the content in carbon must diminish. With more than 1 per cent. of manganese, steel becomes hard and "short," and with 4 to 5 per cent. this property is greatly increased. With 8 to 15 per cent. of manganese, steel behaves quite differently. A manganese steel containing 12 per cent. of manganese and 1 per cent. of carbon acquires, according to the process of forging and tempering, very great strength, its breaking load varying from 81,510 to 254,000 pounds per square inch. The same steel with 12 per cent. of manganese has a magnetic permeability equal to that of air. The presence of this metal in steel, therefore, diminishes its permeability and increases its resistivity, which in the case of 12 per cent. steel reaches 67 micro-centimetres, while the resistivity of iron varies from 9 to 10 microhm-centimetres.

Ferro-nickel.—An alloy of iron and nickel, frequently employed in the construction of rheostats. Its resistivity increases with the content of nickel. A nickel steel with 4.5 per cent. nickel has a resistivity of 29.5 microhm-centimetres. Ferro-nickels are manufactured having resistivities of 86 (rheostatic B) and 78 microhm-centimetres (type HX). This latter breaks under a load of 193,000 pounds to the square inch.

Ferro-silicium.—An alloy of iron and silicium employed in the metallurgy of iron.

Ferro Machine & Foundry Co.—115 Wade Bldg., Cleveland, O. Mfrs. brass, bronze, aluminum, copper and gray iron castings; machine work to order; gaso-

lene automobile motors; piston rings; patternmakers.

Ferry Cap & Set Screw Co.—2151 Scranton Rd., Cleveland, O. Mfrs. screws.

Fessoirat, E.—5 rue des Marais, Versailles, France. Mfrs. non-skids.

Fetch.—To prime a pump. See Prime.

Fetchonsen, E. G.—Prop, Acme Steel & Malleable Iron Works, Military Rd., Buffalo, N. Y.

Fewless-Leen Brass & Iron Co.—Cincinnati, O. Mfrs. pipe and brass fittings.

Fiat Automobile Co. (Fabbrica Italiana Automobili Torino.)—Corso-Dante, Turin, Italy. Makers of the Fiat car, first marketed June, 1897. From 35 to 40 models made since. Cap. \$2,250,000. Avv. Scarfioiti, Pres.; Giovanni Angelli, Managing Director; Enrico Marchesi, Gen. Mgr.; Sig. Enrico and Sig. Fornaca, Designers; Sig. Scachi, Supt. Branches: Teixeira Bros., Lisbon, Portugal; Fiat America, Latina, South America; Fiat Automobile Co., New York City; Fiat Co. of India, Calcutta, B. I.; Fiat Ltd., Melbourne and Sydney, Australia; Fiat Motors, Ltd., London, Eng.; Garages Reunis, Turin, Italy; Her. Mathis, Strassburg, Germany; Lamberjack, E. Paris, France.

Fiat Automobile Co.—1789 Broadway, New York City. U. S. Branch of the Fabbrica Italiana Automobili Torino, Turin, Italy, and importers of Fiat cars and parts.

Fiat, Lange & Cia.—Paseo de la Reforma, Mexico City, Mex. (Fiat.)

Fiber, Cocoa.—A fiber, called also "coir," obtained from the outside of the husk of the fruit of the cocoa-palm, and used for making floor-mats.

Fiber, Vulcanized.—A substance formed of vegetable fiber chemically treated and then strongly compressed and vulcanized. It is produced in two grades, hard and elastic, and of two colors. Both are insoluble in ordinary solvents. Hard fiber, which bears a close resemblance to horn, is very tough and strong, resists compression and maintains its elasticity under all ordinary conditions. Flexible fiber resembles close-grained leather, but is not so flexible. Hard fiber comes in the form of sheets, tubes, and square rods, and the elastic variety in the form of sheets. Vulcanized fiber, which is easily machined, is used as a lining for clutches and brake-bands, and for making noiseless cam-gears, the insulating parts of contact-makers and distributors, washers for steam-joints and gas-pipes, and for many other purposes.

Fich, H. Chr.—Copenhagen, Denmark. (Wayne.)

Fichtel und Cachs.—Schweinfürth, Germany. Mfrs. ball bearings.

Fickling & Co., Inc.—154 E. 57th St., New York City. Factory, New Haven, Conn. Mfrs. and agents for limousine, landaulette and runabout bodies, cape cart, Victoria and canopy tops, slip covers, motor boat tops, wind shields, tops recovered, extra and folding seats, foot rests and coat rails, lamp covers, dust shields, tire covers, painting bodies, upholstering, iron and steel work, trunk carriers, tire irons, lamp brackets, wheels repaired, battery and tool boxes, auto fenders, auto relief springs, "Fickling" ignition and lighting system. Capital, \$15,000. Est. 1905. Successors to Auto Cover & Top Co., September, 1906. W. Irvine Fickling, pres. and treas.; W. W. Fickling, sec.; Henry F. Holbrook, mgr.; C. J. Donovan, head of trimming dept.; W. C. Clark, head of paint shop; G. Smith, head of woodworking dept.; S. Hainpold, head of upholstery dept.; Mr. Byrnes, head of blacksmith dept.

Fickling, W. Irvine.—Pres. and treas. Fickling & Co., Inc., 154 E. 57th St., New York City.

Fickling, Wm. Webb.—Sec. Fickling & Co., Inc., 154 E. 57th St., New York City.

Fiedler, E.—Director Neer Air Cooled Engine Co., Plain City, O.

Field.—An "electric field" is the space in the vicinity of an electrified body, or bodies, in which electrical phenomena are produced by the body. A "magnetic field" is a space having the same relation to a magnetized body.

Field & Co.—Augusta, Ga. (Rambler, Pope-Waverley.)

Field Auto Co.—103 Pryor St., Atlanta, Ga. (Stoddard-Dayton.)

Field Co., Chas. H.—230 Chestnut St., Providence, R. I. Mfrs. special automobile machinery.

Field, C. W.—Pres. Fouch Disk Wheel Co., room 11, Tribune Bldg., Minneapolis, Minn.

Field, Frank C.—605 N. St. Clair St., Toledo, O. Mfr. monograms.

Field, Russell Ambler.—Secretary Long Island Automobile Club, automobile editor Brooklyn Daily Eagle. B. Taunton, Mass., Sept. 4, 1876. Ed. public schools, Taunton. Res., 641 St. Marks Ave., Brooklyn, N. Y. Office, Brooklyn Daily Eagle, Washington and Johnson Sts.,



Brooklyn, N. Y. Recreations, all outdoor sports.

Fieldhouse, J. W.—Elkhart, Ind. Garage.

Fifer, Chas.—Salem, O. (Mitchell.)

Fifield Bros.—Augusta, Me. (Maxwell.)

Fifield, Geo. W.—Pres. New England Motor Co., 82-88 Fletcher St., Lowell, Mass.

Fifth Avenue Garage.—45 W. 44th St., New York City. Garage.

Fifth Wheel.—A horizontal wheel-like bearing, called also a "circle-iron," placed on the front axle of a vehicle to permit of steering by turning the axle in a horizontal plane. Used on horse-drawn but seldom on motor-vehicles.

Fifty-first Street Auto Station.—51st St. and Beaumont Ave., Philadelphia, Pa. Garage.

Fifty-third St. Auto Co.—87 E. 53d St., Chicago, Ill. Garage.

File.—A strip of bar steel, the surface of which is cut into fine points or teeth that act by a species of cutting closely allied to abrasion. Files are made in endless variety, and many that are in all other respects alike differ in the forms and sizes of their teeth, three forms of which are made, viz., those of "double cut" files, those of "single cut" or "floats," and those of "rasps." Floats and rasps are used mostly for woods and soft material. The double-cut are used for metals and general purposes. These are made of several gradations of coarseness, named, respectively: "Rough," "bastard," "second cut," "smooth" and "dead smooth." Very heavy square files used for smooth work are called "rubbers."

After use it will be found that fragments of metal have lodged in the spaces between the teeth, to remove which a "scratch-brush" is employed. (See Pin.) Files should be kept separated by rags or waste to prevent nicking, which if it occurs causes rapid deterioration.

File-brush.—See Brush, File.

File-card.—A thick fabric studded with short fine steel wires, used for cleaning files.

Filiatrault, E. J.—Duluth, Minn. (Thomas Flyer.)

Fillet.—A filling for the sharp corners on pattern work.

Filley, F. B.—Pres. Mound City Oil & Supply Co., 204 N. Commercial St., St. Louis, Mo.

Filley, F. H.—Vice-pres. Mound City Oil & Supply Co., 204 N. Commercial St., St. Louis, Mo.

Fillingham, J. P.—Supt. Reo Motor Car Co., Lansing, Mich.

Fillow Garage, A. H.—87 West St., Danbury, Conn. Special cars built to order. Garage and repair shop. Est. 1890.

Fillegamo e Ca., D.—24 via Mille, Turin, Italy. Mfrs. non-skids, make-and-break plugs.

Filtering Carburetter.—See Carburetter.

Filtz, J.—13 ave. du Roule, Neuilly, France. Mfrs. automobile motors.

Fin.—A projection called also a "feather edge," on a drop forging due to the joints of the dies. (2) Flanges arranged along the piping of a tubular radiator in order to facilitate the cooling. See, Radiator, Fin, Gill and Flange.

Findlater Hardware Co.—San Angelo, Tex. (Holsman.)

Findlay Motor Car Co., The.—301 W. Crawford St., Findlay, O. Garage.

Fine, Horace E.—19 E. State St., Trenton, N. J. Mfr. automobile monograms, lamp numbers, license numbers, markers, straps and Fine's patented removable lamp numbers. Est. 1892. Horace E. Fine, sole prop.

Fine, Horace E.—Sole prop. Horace E. Fine, 19 E. State St., Trenton, N. J.

Finger.—A small projecting piece; a rod to stop a piece or limit its motion; a tappet.

Finger-nut.—The same as Wing-nut. See Nut, Wing.

Finger-screw.—See Screw, Finger.

Finger-tube Boiler.—See Boiler.

Finished Steel Co.—1623 Wilson Ave., Youngstown, O. Mfrs. steel.

Fink, August D.—58 Palmetto St., Brooklyn, N. Y. (Haynes.)

Finks, H. P.—Ft. Smith, Ark. (Holsman.)

Finsterwald, J. J.—Foreman Ohio Electric Works, Cleveland, O.

Fire-extinguisher.—Portable apparatus of one form or another, such, for example, as that of a small glass vessel containing carbon dioxide under pressure, which is broken by contact and liberates its contents, and which is called a "grenade;" or that of a cylinder containing sodium carbonate and in which is liberated a dilute solution of sulphuric acid, forming carbon-dioxide, which is squirted on the fire from a hose connected to the cylinder. The sulphuric acid is kept in a glass bottle, which is broken in order to start the formation of carbon dioxide.

Garages and other places where oil and gasoline are used should be provided with buckets or boxes of sand, which when thrown on a fire caused by the ignition of such combustibles will extinguish it before it has a chance to spread.

Fire-tube Boiler.—See Boiler.

Fireman's Fund Insurance Co.—California & Sansome Sts., San Francisco, Cal. Wm. M. Klinger, Mgr. Automobile fire insurance.

Fire-Proof Garage.—170th St. and Jerome Ave., New York City. Garage.

Fire-Proof Garage, The.—1061-2 Main St., North Adams, Mass. Garage; repairs; supplies.

Firestone, C. D.—Pres. Columbus Buggy Co., Dublin Ave., W. Columbus, O.

Firestone, C. E.—Sec. Columbus Buggy Co., Dublin Ave., Columbus, O.

Firestone, H. S.—Rubber tire manufacturer. B. Columbiana Co., Ohio, 1868. Ed. at Columbiana and Cleveland, Ohio. Res., Akron, O. Address, Firestone Tire & Rubber Co., Akron, O.

Firestone, J. F.—Vice-Pres. Columbus Buggy Co., Dublin Ave. W., Columbus, O.

Firestone Tire & Rubber Co.—Miller St. and Sweitzer Ave., Akron, O. Mfrs. solid and pneumatic tires. Branches: Ellicott & Tupper Sts., Buffalo, N. Y.; 5904 Penn Ave., Pittsburg, Pa.; 240-42 Jefferson Ave., Detroit, Mich.; 2226 Olive St., St. Louis, Mo.; 1442 Michigan Ave., Chicago, Ill.; 9 Park Sq., Boston, Mass.; 211 N. Broad St., Philadelphia, Pa.; 233 W. 58th St., near Broadway, New York City.

Firing.—A general term for ignition, especially ignition of the charge in internal combustion motors.

Fischbeck, Fred.—Pasadena, Cal. (Deere.)

Fischer, J. G.—Saginaw, Mich. (Monarch.)

Fischer, L. A.—Pres. Buffalo Gasolene Motor Co., 280-90 Niagara St., Buffalo, N. Y.

Fischer Special Mfg. Co.—2076-8 Reading Road, Cincinnati, O. Mfrs. spark coils and plugs.

Fischerre et Cie., Martin.—Spitzkekre, Zürich, Switzerland. Mfrs. gasolene automobiles.

Fish Automobile Co.—Bloomington, Ill. Mfrs. gasolene automobiles.

Fishback, R. W.—Supt. Waterman Marine Motor Co., 1506-12 Fort St. W., Detroit, Mich.

Fishbeck, Fred.—Tonopah, Nev. (Chadwick.)

Fish-plate.—A term for a tie-plate used for connecting the ends of rails; also sometimes employed as a synonym for fitch-plate q. v. From old French ficher, "to fix." "Fish," in nautical language, is a name for a splint used to repair a damaged spar.

Fisher, A.—310 Fort St., W., Detroit, Mich. Mfr. auto tops. Garage.

Fisher Auto Storage Co.—219 Ferry St., Easton, Pa. Garage.

Fisher Automobile Co.—330 N. Illinois St., Indianapolis, Ind. (National, Stoddard-Dayton, Mitchell, Maxwell.) Est. 1898. Cap. \$7,500. H. L. Hewitt, Pres.; F. L. Moore, Vice-Pres. and Sales Mgr.; F. B. Willis, Sec. and Head of Sundries Dept.; Carl G. Fisher, Treas.; M. E. Haywood, Head of Repairs Dept. Garage, 150 cars; repairing.

Fisher, Carl G.—Treas. Fisher Auto Co., 330 N. Illinois St., and Pres. Prest-O-Lite Co., 20 S. East St., Indianapolis, Ind.

Fisher Co., A. W.—South Bend, Ind. Mfrs. magnetos and ignition dynamos.

Fisher, F. J.—Vicksburg, Miss. (Reo.)

Fisher, Henry.—Vice-Pres. and Mgr. Diezemann Shock Absorber Co., 1311-13 Hudson St., Hoboken, N. J.

Fisher, J. L.—Maryville, Mo. (Waltham.)

Fisher, O. P.—Pres. The Broc Co., 1665-9 E. 40th St., 4021-3 Payne Ave., Cleveland, O.

Fisher, Peter J.—57 W. 66th St., New York City. Garage.

Fisher, Sam.—Pres. Diezemann Shock Absorber Co., 1311-13 Hudson St., Hoboken, N. J.

Fisk, Albert J.—Gen. Mgr. Witherbee Igniter Co., 541 W. 43rd St., New York City.

Fisk, Geo. C.—Pres. Fisk Mfg. Co., Walker St., Springfield, Mass.

Fisk, H. G.—Sec. The Fisk Rubber Co., Oak St., Chicopee Falls, Mass.

Fisk Mfg. Co.—Walker St., Springfield, Mass. Mfrs. automobile body soap. Cap. \$50,000. Est. 1857. Geo. C. Fisk, Pres.; W. S. L. Hawkins, Treas. and Gen. Mgr.

Fisk Rubber Co., The.—Oak St., Chicopee Falls, Mass. Mfrs. mechanically fastened and standard clincher automobile tires; single tube bicycle tires. Mem. M. & A. M. Cap. \$600,000. Est. 1897. H. T. Dunn, Pres.; E. H. Broadwell and J. C. Cole, Vice-Pres.; A. N. Mayo, Treas.; H. G. Fisk, Sec.; G. N. Carpenter, Head of Accounting Dept.; G. A. Ludington, Head of Factory. Branches: Atlanta, 103 N. Pryor St.; Boston, 239 Columbus Ave.; Buffalo, 718 Main St.; Chicago, 1440 Michigan Ave.; Cleveland, 318 Euclid Ave.; Denver, 1555 Tremont St.; Detroit, 262 Jefferson Ave.; Kansas City, 1330 Main St.; Los Angeles, 1034 S. Main St.; Minneapolis, 704 Hennepin Ave.; New York, 754 7th Ave.; Philadelphia, 140 N. Broad St.; San Francisco, 1036 Golden Gate Ave.; Seattle, 719 E. Pike St.; Springfield, 135 Bridge St. Agencies: F. O. Sawyer, 3908 Olive St.; St. Louis, Mo.; Rubber Tire Wheel Co., Toronto and Montreal; South British Trading Co., 13 Wilson St., London.

Fiske Auto Co.—167 Pine St., Providence, R. I. (Buick.)

Fiske Bros. Refining Co.—13-15 Oldslip, New York City. Mfrs. grease and oils.

Fiske, L. D.—43 Wells St., Hartford, Conn. (Fiat, Panhard, Locomobile.)

Fiss, Doerr & Carroll Co.—153 E. 24th St., New York City. (Reliance, American.) Est. 1895. Fred Wagner, Pres.; J. B. Carroll, Treas. and Sec.; L. B. Sanders, Gen. Mgr.; E. E. Haskins, M. E.

Fitch, L. M.—Pres. The Maxwell & Fitch Co., 218 S. Washington St., Rome, N. Y.

Fissures.—Cracks caused by the freeze-

ing of the circulating water in the jackets of a water-cooled motor or in the explosion-chamber. If the fissure is not too wide it can be "rusted over" by means of sal-ammoniac, etc.

Fitch Auto Co.—410 S. Main St., Los Angeles, Cal. (Simplicity.)

Fitch, L. M.—Pres. The Maxwell & Fitch Co., 218 S. Washington St., Rome, N. Y.

Fitchard & Co., H. T.—9 Columbia St., Utica, N. Y. (Maxwell.)

Fitchburg Auto School & Garage Co.—841 Elm St., Manchester, N. H. Garage.

Fitchburg Auto Transit Co.—Fitchburg, Mass. Garage.

Fitchburg Machine Works.—Fitchburg, Mass. Mfrs. special automobile machinery.

Fitt, James.—106 Commercial St., Rochester, N. Y. Repairing.

Fittings.—The smaller parts of a machine, etc., constructed separately and afterward added to the main part.

Fitts, E. A.—Sec. and Treas. The Auto-car Co., Ardmore, Pa.

Fitz, Chas. R.—Southampton, L. I., N. Y. (Maxwell.)

Fitzgibbon & Crisp Carriage & Auto Body Co.—Trenton, N. J. Mfrs. wood and metallic bodies and auto tops.

Fitzgibbon, John Edward.—Advertising manager and automobile editor of Milwaukee Sentinel. B. Neenah, Wis., Feb. 7, 1885. Ed. High School, Milwaukee. Office, Milwaukee Sentinel, Milwaukee, Wis.

Fixit Shop, The.—Moyer St., Canajoharie, N. Y. Est. Dec. 6, 1905. Willis Bullock, Jr., Mgr. Repairing.

Flaccus, G. E.—Sec. The J. Kowalsky Engine Co., Grant St. and Railroad Ave., Verona, Pa.

Flagg & Co., Stanley G.—Philadelphia, Pa. Mfrs. malleable iron and steel castings.

Flagler Co.—Brooklyn, N. Y. Garage. Cap. \$25,000. Incorporators: A. R. Pardington, F. W. Flagler, L. K. Israel, H. C. Umland, C. F. Hart, C. H. Bowden, P. J. Zimmerman.

Flagler, Henry M.—Capitalist. B. Canandaigua, N. Y., 1830. Ed. public schools. With Messrs. Rockefeller and Andrews organized firm of Rockefeller, Andrews and Flagler, which was succeeded by the Standard Oil Co., with which he is prominently identified. Director: Chicago, Rock Island & Pacific Ry., Minnesota Iron Co., Duluth & Iron Range R. R., Western Union Telegraph Co., International Bank Note Co., Jacksonville, Tampa & Key West Ry. Mem. New England Society, Union League, Metropolitan, New York, City, Larchmont, Am. Yacht, Knollwood Golf and Automobile Club of America. Has been prominent in the development of Florida as a winter resort, has built a number of hotels

and about 600 miles of railway in that State and has fathered the annual automobile race meets held by the Florida East Coast Automobile Ass'n. on the Ormond-Daytona beach. Address, 26 Broadway, New York City.

Flagler, John Haldane.—Capitalist. Officer and director in many corporations, including Nat. Tube Co., Am. Union Life Ins. Co., Nat. Bank of North America, Assurance Co. of America, Crocker-Wheeler Elec. Co., etc. Mem. S. A. R., A. C. A., Chamber of Commerce, Am. Inst. of Mining Eng., Am. Museum of Natural History, Met. Museum of Art, N. Y. Yacht, Lotos, Lawyers, Am. Yacht, Larchmont Yacht. Res., 15 Park Ave. Office, 196 Broadway, New York City.

Flame Ignition.—See Ignition.

Flammer, L.—28 rue des Prairies, Paris, France. Mfrs. goggles.

Flanders, W. E.—Factory Mgr. Ford Motor Co., Detroit, Mich.

Flange.—Any flat projecting rim used for strengthening a part, or for providing for its junction to another part. (2) A thin copper or cast iron ring imbedded in the external walls of an internal combustion cylinder in order to facilitate cooling. See Fin and Gill.

Flange-coupling.—See Coupling, Face-plate.

Flanigan, Thos. J.—Pres. and Sec. Aetna Brass Mfg. Co., 4800 Hamilton Ave., Cleveland, O.

Flank.—The lower part of the teeth of a spur-gear.

Flanner, D. D.—Pres. Milne Auto-Start Co., Toledo, O.

Flap-valve.—See Valve, Flap.

Flash Boiler.—See Boiler, Flash.

Flash-point.—A term used to indicate the temperature at which a mineral oil, on being slowly heated, will give off inflammable vapor in sufficient quantity to "flash" or ignite on the application of a light.

Flash Chemical Specialty Co.—7-9 Fulton Pl., Boston, Mass. Mfrs. automobile body soaps.

Flask.—The iron or wooden frame used in foundries to support and contain the sand used in moulding.

Flatbush Automobile Co.—50 Tilden Ave., Brooklyn, N. Y. (Deere.)

Flatbush Motor Car Co.—448 Snyder Ave., Brooklyn, N. Y. (Corbin, Columbus.) Est. July 1906. Cap. \$6,000. Louis Ruprecht, Treas. and Gen. Mgr. Garage, 100 cars; repairing.

Flat Rock Automobile Co., The.—Flat Rock, Ind. Est. June 1905. M. M. Nading, Pres.; H. M. Wright, Sec. and Treas. Garage, 15 cars; repairing; supplies.

Fleischmann, M.—Titania Werke, Vienna, Austria. Mfrs. primary batteries.

Fleischmann, Max C.—Vice-president

The Fleischman Co. B. Cincinnati, O., Feb. 26, 1877. Ed. Cincinnati and College Hill, O. Director of Fleischmann Co., Market National Bank, Riverside



Malting & Elevator Co., Cincinnati Exhibition Co., American Diamalt Co., Union Grain & Hay Co., all of Cincinnati, and Illinois - Vinegar Mfg. Co., Chicago, Ill. Mem. of N. Y. Yacht Club. Atlantic Yacht Club, Royal Nova Scotia

Yacht Club. Automobile Club of America, Queen City Club (Cinn.), Cinn. Country Club. Arctic Club, Explorers' Club, Aero Club Res. 3850 Clifton Ave., Cincinnati, O. Office, 419 Plum St., Cincinnati, O. Used first automobile 1897; balloon, 1907; boat, 1908. Recreations. outdoor sports, motoring, yachting, aeronautics.

Fleming & Brown.—Station St., Kankakee, Ill. (Rambler.)

Fleming, T. R.—Treas. and Mgr. Temple Pump Co., 15th St. and 15th Pl. near Canal St., Chicago, Ill.

Fleming, Institut Cartographique Carl.—Glogau, Germany. Pubs. maps.

Flescher, Louis.—1622 Capitol Ave., Omaha, Neb. (Indian.)

Fletcher, A. C.—Owner and Mgr. Ohio Electric Works, Cleveland, O.

Fletcher, H. M.—Sec. Long Arm System Co., Lakeside Ave. and E. 38th St. Cleveland, O.

Fletcher, R. L.—Mgr. Garage, Nashville Motor Car Co., Church and 9th Sts. Nashville, Tenn.

Flewelin, M. C.—Mendon, Mich. Garage.

Flexibility.—By the term "flexibility," as applied to a gasoline car, is meant that characteristic which permits of a motor being run at widely different velocities and which allows of such changes being realized with the utmost promptness.

Flexible Shaft.—See Shaft, Flexible.

Flexure.—The act, process, or mode of bending; specifically, in mechanics, the bending of planes into cones or cylinders

In the calculation of flexure, the moment of inertia of the body's profile and its neutral fiber are brought in, and the fibers of the body which work the most during flexure are considered.

Flick, W. C.—Ransom, Ill. Garage.

Flint Garage Co.—402 N. Saginaw St., Flint, Mich. Garage.

Flint Motor Car Co.—212 Union St., Providence, R. I. (Packard.)

Flitch-plate.—A metal plate bolted to a wooden beam in order to strengthen it.

Float.—In a carburetter, a cork or hollow metal cylinder, F (see figure), to which is fastened a needle-valve, B, of which the point enters a seat in the supply-pipe, A. When the level of the li-



quid becomes low, the valve opens the orifice of the supply-pipe and the gasoline enters. When the proper level is reached, the needle-valve closes the orifice and prevents any inflow of fuel until the level again descends.

(2) A file with but one series of teeth, which do not cross, as in an ordinary file. See File

Float-chamber.—The part of a float-feed-carburetter which encloses the float. See Float.

Float-feed.—A term for the type of carburetter in which the level of the gasoline is maintained by a float. See Carburetter.

Floating Axle.—See Axle, Floating.

Flock & McBee.—Mobile, Ala. (Buick.)

Flock, H. J.—Sterling, Ill. (Rambler, Premier.)

Flood & Conklin Co.—136 Chestnut St., Newark, N. J. Mfrs. varnishes.

Flooding.—A carburetter is said to be "flooded" when, through a leak in the float, the latter does not close the needle-valve and the chamber consequently becomes filled with gasoline. When such a leak occurs it can be easily stopped by a touch of solder after the gasoline enclosed in the float has been driven out.

Florida Automobile Association.—Dr. F. P. Hoover, Sec., Stockton-Budd Bldg., Jacksonville, Fla.

Florida East Coast Automobile Association.—Daytona, Fla. A. B. Foster, Cleveland, O., Pres.; Geo. E. Sebring, Sebring, O., 1st Vice-Pres.; S. H. Gove, Daytona, Fla., 2nd Vice Pres.; T. E. Fitzgerald, Daytona, Fla., Sec.; F. N. Conrad, Treas. Organized to promote international races, to be held each January on the Ormond-Daytona Beach.

Flower & Co., Walter L.—St. Louis, Mo. Mfrs. flexible tubings.

Flower, A. R.—Vice-Pres. H. H. Babcock Co., Factory Sq., Watertown, N. Y.

Flowers, W. H.—Pur. Agt. American Motor Car Co., Indianapolis, Ind.

Floyd, Robert M.—Gen. Mgr. General Vehicle Co., Broadway and 62nd St., New York City.

Flue.—One of the tubes of a steam boiler through which the hot gases of combustion pass.

Fluid.—A body which flows, which has no definite form and assumes that of the vessel which contains it. Gases come un-

der this definition, and, besides, possess the property of having no definite volume, since they always occupy the largest volume possible.

Fluids, which consequently comprise liquids and gases, are therefore characterized by the mobility of their molecules. Such mobility, moreover, is of the most variable character, and it is impossible to establish an absolute nomenclature of fluids from the fact that there are intermediate bodies which have no determinate form, and which nevertheless could not be termed fluids, such, for example, as syrups, pastes, etc.. Moreover, it is generally possible to bring a body to a fluid state under the effect of an increase of temperature or pressure. The mobility of liquid fluids is characterized by viscosity. It is possible to measure this by counting the number of drops which make their exit in a unit of time from a given orifice and under given conditions. See Viscosity.

Fluke.—The part of an anchor that engages the bottom.

Fluke, F. S.—6036 Woodlawn Ave., Chicago, Ill. Mfrs. lock nuts and washers.

Flurkey Carriage & Trimming Co.—566 Wabash Ave., Chicago, Ill. Mfrs. automobile tops.

Flush.—To clear out a space by passing a liquid through it. The valves of motors are "flushed" with gasoline to wash grit or deposit from the seats. (2) At the same level, forming part of the same surface.

Flush-bolt.—See Bolt. Flush.

Flusher.—A small plunger fitted in the float-chamber of a carburetter for the purpose of ensuring an adequate supply of gasoline vapor. See Ticker.

Flushing Auto Garage.—107 Broadway, Flushing, N. Y. Garage; repairing.

Flutcher, Joe T.—(Gadsden Garage), Gadsden Ala. (Cadillac.) Garage.

Flux.—The total number of lines of force which pass through any given space or cross any given area. (2) A chemical product capable, by its fusibility and reducing oxidizing properties, of acting like borax in the operation of soldering and brazing, or the fusion of metals. Among fluxes are zinc chloride, resin, stearine, borax, cream of tartar, the alkaline fluorides, silicic acid, ground glass, etc. See Zinc, Chloride.

Flying-machine.—See Machine, Flying.

Flynn, James J.—Sole Owner Capitol Hill Garage, 615 B. St., S. E., Washington, D. C.

Flynn, Roger L.—Mgr. Capitol Hill Garage, 615 B St., S. E., Washington, D. C.

Flynn, Walter F.—110 Market St., Youngstown, O. Garage.

Fly-nut.—The same as "wing-nut." See Nut, Wing.

Fly-wheel.—A heavy wheel, called also a "balance-wheel," usually of cast iron, attached to the end of the crank-shaft, and acting as an accumulator of energy, in the form of live power, to carry the piston over the dead-point, and adding also to the smooth running of the car by its tendency to reduce vibration. See Force, Centrifugal.

Foaming.—A technical term for the frothing in a steam boiler due to greasy or dirty water, etc.

Foley & Smith.—Greenburg. Ind. (Jackson. Rambler, Logan.)

Foley, E. T.—Supt. Greene Motor Car Co., 88-90 Washington St., Newark, N. J.

Foley, J. C.—Jerome Ave. and 162nd St., New York City. Garage.

Folitz, M.—Head of Mechanical Dept. E. M. Benford, 497 W. Lincoln Ave., Mt. Vernon, N. Y.

Follower.—Of two wheels in gear, the one to which motion is communicated by the other called the "driver."

Folsom Mfg. Co., C. G.—South Bend, Ind. Mfrs. fenders, tanks, hoods.

Fontaine, Emil.—Treas. Michelin Tire Co., Milltown, N. J.

Foot-brake.—See Brake, Foot.

Foot-pedal.—See Pedal, Foot.

Foot-valve.—See Valve, Foot.

Foot Bros. Gear & Machine Co.—24 S. Clinton St., Chicago, Ill. Mfrs. transmission gears.

Foote, H. L.—Adv. Mgr. Peerless Motor Car Co., 93rd and Quincy Ave., Cleveland, O.

Footstep Bearing.—See Bearing, Step.

Forbes, Allen H.—Amherst, Mass. (Waltham.)

Forbes, Geo.—Union St., Olean, N. Y. (Ford.)

Forbes, J. B.—Forbes Bldg., Coshocton, O. (Winton, Stoddard-Dayton.)

Forbes, S. F.—Pur. Agt. Fairbanks, Morse & Co., Franklin and Monroe Sts., Chicago, Ill.

Force.—In mechanics any cause that produces motion or modifies motion in material bodies. In this sense all known forces have their origin in three causes: (1) gravitation; (3), the unknown cause of heat, light and electricity; and (3), life or the mysterious agency producing motion of animals.

Force, Centrifugal.—The force by which a body revolving about a center, or about another body, has a tendency to recede from it. The centrifugal force of a body describing a circle with a uniform velocity is directly proportional to the square of the velocity, and inversely as the radius of the circle. In the case of a fly-wheel,

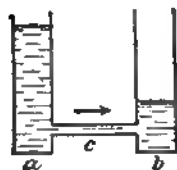
$$\frac{\text{velocity}^2 \times \text{weight}}{\text{radius} \times 32} = \text{centrifugal force.}$$

Force, Centripetal.—The force which tends to attract the material points of a revolving system toward the center of rotation.



Let us consider a point revolving about O as a center. It tends to fly off according to the tangent F, but is held back by the cohesion of the revolving body. It must be granted, then, that a force F attracts the point A toward the center; this is centripetal force.

Force, Electromotive.—The electric force which determines the passage of a current in a circuit. An analogy furnished by hydraulics explains the mode of action of the electromotive force.



If we take two communicating vessels, a and b (see figure), a current of water will be set up in the direction shown by the arrow, and the intensity will be directly proportional to the difference in level, and inversely proportional to the resistance offered by the pipe c—a resistance which, in order to be overcome, will absorb a certain quantity of energy.

In like manner, in the case of the electric current, the e. m. f. generates a current; the intensity of which depends on the "difference of potential" between two points and on the electric resistance between such points. This resistance occasions a fall or loss of volts equal to the product of the resistance by the intensity. The e. m. f. and the difference of potential is estimated in volts.

Force, Live.—What is called "live force" or "live power" of a body in motion is the product of its mass by the square of its velocity, say mv^2 .

Force, Magnetizing.—The force necessary to create a given induction in a magnetic circuit.

This magnetic force is so much the greater in proportion as the medium is less permeable, that is to say, opposes itself more to the passage of the lines of force.

Soft iron is very permeable, and cast iron much less so. The air and non-magnetic materials are very slightly permeable.

Force, Magnetomotive.—The magnetic force necessary to cause the passage, in a magnetic circuit of given length, of a flux of induction of given value. The magnetomotive force per unit of length, that is to say, per centimetre, is called the "magnetizing force." Theoretically,

magnetizing forces are estimated in "gilberts," and, practically, in ampere-turns. See Ampere-Turns.

Force, Moment of.—The product of the amount of a force by its perpendicular distance from a given point is called the "moment of the force" about such point. This product is called also "turning moment" and "torque."

Force-pump.—See Pump, Force.

Ford Agency.—127 Franklin St., Norwich, Conn. (Ford.)

Ford Auto Co.—Jefferson Ave., Detroit, Mich. (Ford.)

Ford Auto Co.—688 N. High St., Columbus, O. (Ford.)

Ford, Henry.—Automobile mfr. Pres., Gen Mgr. and Designer Ford Motor



Co. B. Greenfield, Mich., July 30, 1863. Ed. public school President Ford Motor Co., Member A. A. A. Res., 66 Edison Ave., Detroit, Mich. Office, Piquette and Beauvillien Sts., Detroit, Mich. In trade

since 1898. Used first car 1891.

Ford, H. N.—Jamestown, N. D. (Dolson.)

Ford Motor Co.—Detroit, Mich. Makers of the Ford car, first marketed in 1903. Eight models made since. Cap. \$100,000. Henry Ford, Pres., Gen. Mgr. and Designer; John F. Dodge, Vice-Pres.; Jas. Couzens, Sec. Treas.; Thos. Walburn, Supt.; H. Limbach, Purch. Agt.; W. E. Flanders, Factory Mgr.; N. A. Hawkins, Commercial Mgr.

Ford Motor Co.—445-51 N. Broad St., Philadelphia, Pa. (Ford.)

Ford Motor Co.—Kansas City, Mo. (Ford.)

Ford Motor Co.—147 Columbus Ave., Boston, Mass. (Ford.)

Ford Motor Co.—1444 Michigan Ave., Chicago, Ill. (Ford.)

Ford Motor Co.—1913 Euclid Ave., Cleveland, O. (Ford.)

Ford Motor Co.—1721 Broadway, New York City (Ford)

Ford Motor Co.—318 E. 11th St., Kansas City, Mo. (Ford.)

Ford Motor Co.—727 Main St., Buffalo, N. Y. (Ford.)

Ford Motor Co. of Canada, Ltd.—Walkerville, Ont., Canada. (Ford.) Garage.

Ford, S. N.—Pres. Humphreys Mfg. Co., 201 E. 5th St., Mansfield, O.

Ford, W. M.—1227 N. Washington Ave., Scranton, Pa. (Jackson.)

Forefoot.—The foremost piece of the keel of a boat.

Fore 'N' Aft.—Chicago, Ill. Pub. monthly by Howard I. Shaw.

Forest & Malone.—10 Norcross Ave., Rochester, N. Y. (Merkel.)

Forest & Monk.—115 Central Ave., Great Falls, Mont. Garage.

Forest Automobile Co.—St. Louis, Mo. Mfrs. gasoline automobiles. (Oldsmobile.) Garage.

Forest City Brass Works.—Cleveland, O. Mfrs. brass, bronze, aluminum and copper castings.

Forest City Motor Car Co.—101-149 Walnut St., Massillon, O. Makers of the Jewel car; first marketed December, 1904. Five models made since. Cap. \$50,000. H. A. Croxton, Pres. and Treas.; O. P. Bernhardt, Vice-Pres. and Gen Mgr.; W. E. N. Hemperly, Sec.; Chas. Kline, Designer; Chas. Stevens, Supt.; Mark C. O'Connor, Purch. Agt.; J. N. Merwin, Sales Mgr. and Advt. Mgr. Agents and dealers: Andrews & Fite, Georgetown, O. R. S. Anthony, Fresno, Cal. Asay, J. E., Rock Island, Ill. Banfil, W. H., 78 Portland St., Boston, Mass. Beauman, Frank, Lampassas, Tex. Bonney Motor Car Co., 1112 Locust St., Kansas City, Mo. British Columbia Auto Co., Vancouver, B. C. Brown, Chas. A., Woodfield, O. Brown, J. M., Mansfield, O. Bulger, W. J., Oswego, N. Y. Burgener, W. H., Canton, O. Burton, Reeves, Freeport, Ill. Cavin, I. H., McComb, O. Clanton, W. H., Montgomery, Ala. Cox, J. W., Kensington, O. Craig Garage, Toledo, O. Cushman, A. T., Caribou, Me. Davis, W. B., 92 Ontario St., Cleveland, O. De Voe, Ralph, Lima, O. Evans Motor Car Co., Minneapolis, Minn. Fellwock Auto & Mfg. Co., Evansville, Ind. Freese, A. D., Nellie, O. Giesey, 2142 N. Walnut St., Wheeling, W. Va. Gould & Son, A. R., Scranton, Pa. Groth, Geo. H., Hillsboro, O. Hagmann & Hammerly, 1305 Michigan Ave., Chicago, Ill. Hamilton, Paul H., Youngstown, O. Hanley, I. E., Huntington, W. Va. Hannon, Geo. E., 1441 Welton St., Denver Colo. Hays, Walter, 1116 Main St., Buffalo, N. Y. Heald, J. Frank, 130 N. Main St., Sheridan, Wyo. Hearsey Vehicle Co., H. T., Indianapolis, Ind. Heath, C. H., Fort Dodge, Ia. Levi Jarvis, Pingree, N. Dak. Jewel Auto Co., 645 Maryland Ave., Washington, D. C. Warren, C. Johnson, Independence, Kas. Karback Auto & Vehicle Co., Omaha, Neb. Kitzmiller & Voorhees, Flora, Ind. Kriner, J. J., Chambersburg, Pa. Lappe, J. H., Sabina, O. Latta, L. M., Akron Water Works, Akron, O. McIrwin & Walker, Kensington, O. McLaughlin, W. A., Zanesville, O. Miller, E. H., Canal, Dover, O. Chas. Mills, 21 E. Church St., Newark, O. Orlando, J. A., Columbus, O. Palis, F. W., Spring St., Shreveport, La. Park Hardware Co.,

Warren, O. Pfeiffer, T. S., York, Pa. Philadelphia Auto Sales Co., 332 N. Broad St., Philadelphia, Pa. Pixley, O. C., Des Moines Clay Mfg. Co., Des Moines, Ia. Richmond-Jarvis Co., Grand Rapids, Mich. Seligman, A. F., Troy, Ill. Shipper Bros., London, Eng. Siegfried, J. B., Cambridge, O. Steger, H. B., Douglas, Ariz. Tanner, W. A., St. Johns, Kas. Thiessen, Fred., Huntington, Chilton, Wis. Thorpe, B. E., Los Angeles, Cal.; 117 W. 16th St., San Francisco, Cal. Tolerton, I. G., Alliance, O. Torgler, E. R., Braun-Torgler Co., Toledo, O. Warwick, J. G., & Co., 5971 Center Ave., Pittsburg, Pa. White, Chas., Monet, Mo. Western Motor Car Co., Sacramento, Cal. Williams, J. H., Monroe, Wis. Wolfe, F. D., San Jose, Cal. Wood, Harry care of Dayton Auto Co., Dayton, O. Woodman Sons, C. R., Westbrook, Me.

Forest City Spring Work.—Cleveland, O. Mfrs. leaf springs.

Forest et Cie., G.—32 bvd. Henri IV, Paris, France. Mfrs. acetylene lamps and radiators.

Forest Hill Garage.—Verona and Clinton Ave., Newark, N. J. Repairing.

Foresti Terzo.—4 via Chiaravalle, Milan, Italy. Mfrs. coils.

Forg, Peter.—Park St., Somerville, Mass. Mfr. body irons, gasoline and kerosene burners, sprockets, stampings, tube expanders.

Forge.—A hearth or fireplace, consisting of a cavity lined with fire-clay or brick upon which the ignited fuel is placed and upon the back and sides of which a powerful blast of air is driven by bellows. Forges, constructed so as to be portable, are made for use in garages and automobile repair shops.

Forges de Douai.—52 bvd. Haussmann, Paris, France. Mfrs. pressed steel frames and metallic wheels.

Forges et Ateliers du Nord.—Turcoing, France. Mfrs. pressed steel frames.

Forging.—A metallurgical operation, principally applied to iron and based upon the malleability of metals at appropriate temperatures. The work is effected by means of a tool (anvil) acting as a support for the piece to be forged, and by a tool (hammer) operating as a heavy weight for compressing the piece on the anvil.

Forging, Drop.—A steel or other metallic object forged while hot between dies which are pressed together by means of a drop-hammer.

Fork.—A device for shifting a belt from one pulley to another or for sliding gears into engagement. (2) In a motor-cycle, the part of the machine in which the front wheel revolves.

Forman Motor Mfg. Co.—Dayslane,

Coventry, England. Mfrs. automobile motors.

Formed.—The accumulator plates of the Planté variety are said to be "formed" after they have assumed a spongy character due to a process of repeated charging and discharging the cells. See Cell, Secondary.

Formetal.—A new alloy which is beginning to be used in the automobile industry for the construction of parts which must be able to resist great pulling or twisting strains.

The alloy contains, besides the normal elements of bronzes and brasses, other metals of high mechanical resistance. It can be cast, rolled and drawn in bars of any outline desired. Its resistance to breakage is 43 kilogrammes per square millimetre, or 617 pounds per square inch; its elastic limit, 27 to 28 kilometres per square millimetre, or 386 to 390 pounds per square inch, and its elongation 40 per cent.

Fornaca, Sig.—Engineer and designer, with Sig. Enrico, of the Fiat Automobile Co. (Fabbrica Italiana Automobili Torino), Turin, Italy.

Forry, Ed. S.—120 S. Meridian St., Portland, Ind. (Jewel.)

Forster, C. G.—Vice-Pres. A. O. Smith Co., Milwaukee, Wis.

Forsyth & Davis.—777 Broadway, Kingston, N. Y. Garage. Repairing.

Forsythe Mfg. Co.—308 Terrace, Buffalo, N. Y. Mfrs. stampings.

Forsyth, W. H.—Sec. and Gen. Mgr. Curtain Supply Co., 85-93 Ohio St., Chicago, Ill.

Fort Dodge Automobile Co.—Fort Dodge, Ia. (Cadillac. Pope-Hartford.)

Fortier-Beaulieu jeune.—Roanne, France. Mfrs. non-skids.

Fontin, Geo.—237 Court St., Kankakee, Ill. (Maxwell.)

Fortin Tool Co., B. P.—227 N. Main St., Woonsocket, R. I. Mfrs. special automobile machinery.

Fort Pitt Automobile Co.—Baum St. and Euclid Ave., Pittsburg, Pa. (Stearns, Locomobile, Oldsmobile.) Est. April, 1906. Cap. \$50,000. H. O. Evans, Pres.; Robt. M. Straub, Treas.; Thos. L. McGovern, Sec.; John H. Stubbe, Vice-Pres. Garage, 50 cars; repairing.

Fort Pitt Motor Mfg. Co.—New Kensington, Pa. Mfrs. gasoline automobiles, "Pittsburg Sixes." 4 models, 50 h. p.

Fort Wayne Electric Works.—Fort Wayne, Ind. Mfrs. electric motors.

Fort Wayne Gear Co.—North American Bldg., Fort Wayne, Ind. Mfrs. and jobbers transmission gearing, friction clutches. Cap. \$10,000. Est. 1905. Maurice I. Rosenthal, Pres.; Joseph Fueburger, Vice-Pres.; W. H. Olds, Sec. and Treas.

Fort Wayne Motor Car Co.—Fort Wayne, Ind. (Cadillac.)

Fort Worth Auto Co.—1422 Penn Ave., Fort Worth, Tex. (Elmore, Haynes, Franklin.)

Fosdick Co., Harry.—55 Stanhope St., Boston, Mass. (Atlas.)

Foss, E. N.—Pres. Becker-Brainard Milling Machine Co., 110 Business St., Hyde Park, Mass.

Foss-Hughes Motor Car Co.—221 N. Broad St., Philadelphia, Pa.; 512 Industrial Trust Bldg., Providence, R. I.; Wilmington, Del. (Great Arrow, Cadillac, Baker, Knox.) Storing and general garage work, electrical charging and repairing.

Fossil Wax.—The same as ozokerite, q. v.

Foster & Brown.—Main St., Westbrook, Me. Repairing. Mfrs. torch heaters.

Foster, A. B.—Pres. Nungesser Electric Battery Co., 3519 King Ave. N. E., Cleveland, O.

Foster, C. H.—Mgr. Gabriel Horn Mfg. Co., Cleveland, O.

Foster, Herbert.—Asst. Treas. Franklin H. Kalbfleisch Co., Broadway and 16th St., New York City.

Foster James H.—Vice-Pres. and Gen. Mgr. Hydraulic Pressed Steel Co., E. 61st St., Cleveland, O.

Foster, J. A.—Pres. Davis Automobile Co., Inc.—7 Dorrance St., Providence, R. I.

Fostoria Auto Machine Co.—McDougal and Poplar Sts., Fostoria, O. (Pope-Toledo.)

Forstoria Garage & Motor Co.—123 E. Tiffin St., Fostoria, O. (Franklin, Elmore, Pope-Hartford, Pope-Waverley.)

Foucalt Currents.—See Eddy Currents.

Fouch Disc Wheel Co.—Room 11, Tribune Bldg., Minneapolis, Minn. Mfrs. pressed steel automobile wheels, made in two halves forming the groove for the tire at the rim and complete with the exception of the hub. Cap. \$100,000. C. W. Field, Pres.; F. I. Whitney, Vice-Pres.; James R. Fouch, Sec., Treas. and Mgr.

Fouch, James R.—Sec., Treas. and Gen. Mgr. Fouch Disc Wheel Co., Room 11, Tribune Bldg., Minneapolis, Minn.

Fouche, Ira.—E. 4th St., Ashland, O. (Cameron.)

Fougerat, J. S.—Neuvy-sur-Loire (Nièvre), France. Mfrs. pneumatic rubber and leather tires.

Foullaron, G.—54 rue de Villers, Levallois-Perret (Seine), France. Mfrs. gasoline automobiles.

Founding.—The process of forming an object, such as a motor-cylinder, by casting it in a mould.

Foundry.—Browning Bldg., Cleveland, O. Penton Pub. Co., monthly.

Four-cycle Motor.—A common abbreviation of the expression "four-stroke cycle motor." See Cycle.

Fournier, A.—New London, Conn. (Atlas.)

Fournier, Edouard.—67 rue de Chabrol, Paris, France. Mfr. motorcycles.

Fournier et Pionchon.—42 bis rue de Sevastopol, Lyons, France. Mfrs. steering gears.

Fournier, Henry.—1 Rue du Midi, Neuilly-sur-Seine. Born at Mans, April 13, 1871. He is the celebrated winner of the Paris-Bordeaux and Paris-Berlin races. Fournier was first a mechanic, in



his father's shop at Mans. After many successes gained in cycling Charron took him to Paris and put him in the Clement establishment. This was the starting point of a long series of successes, which are familiar to all. He twice visited

the United States, and on his return thence from his second trip he, in conjunction with Messrs. Civet and Ra-bourdin, organized the Société et Garage Paris-Automobile, which has become one of the best known centers of the automobile industry of the present time. It may be added that Fournier has taken part in motor-boat races, and gained the victory at the Lucerne meeting in 1904, and became this same year the holder of the Gaston Menier Cup.

Fourth St. Automobile Co.—323 E. 4th St., Long Beach, Cal. (Maxwell.)

Four Traction Auto Co.—Mankato, Minn. Mfrs. gasoline commercial automobiles.

Four-way Cock.—See Cock.

Foust & Foust.—Warren, Ind. (Holman.)

Fowler Bros.—Putnam Ave., Greenwich, Conn. (Ford.)

Fowler, C. W.—Pueblo, Colo. (Reo.)

Fowler, Frank.—Springfield, Mass. Garage.

Fowler & Co., John.—Madgeburg, Germany. Mfrs. steam commercial automobiles (Tractors).

Fowler Machine Co.—1781 Middlesex St., Lowell, Mass. Mfrs. gasoline automobile and marine motors.

Fowler-Manson-Sherman Cycle Mfg. Co.—45-7 Fulton St., Chicago, Ill. Mfrs. motorcycles.

Fox, Fred.—Stronghurst, Ill. (Wal-tham.)

Fox Reversible Gasoline Engine Co.—Covington, Ky. Mfrs. gasoline marine motors.

Fox, W. A.—249 3rd Ave. S., Minneapolis, Minn. (Cartercar.)

Fraenkel.—28 rue du Quatre Septem-bre, Paris, France. Mfr. wearing apparel; coats.

Fraleigh Bros.—W. Market St., Rhinebeck, N. Y. Garage.

Frame.—That part of a motor-vehicle which supports the carriage body, motor, and transmission, and to which, beneath, are attached the wheel-axes. Frames are constructed in numerous ways, but, whatever be their material, are usually quadrilateral in contour. In early construction the material employed was drawn steel tubes brazed together, the arrangement being similar to that found in bicycles, but frames built in this manner, having for various reasons been found unsuitable for general automobile use, are scarcely employed at present except for light carriages and motorcycles. Subsequently, greater rigidity and strength was secured by the use of angle-steel, or that of "armored wood," that is to say, wood encased in steel or strengthened by steel fitch-plates, or steel plates bolted to the side-members. Although some manufacturers still adhere to the use of angle-steel and armored wood, the material now almost universally employed is pressed steel, which possesses strength and lightness, in addition to many other advantages. Frames are pressed (sometimes in an entire piece) between dies, from blanks of sheet-steel or hard sheet-steel. Although usually pressed cold, they are sometimes also hot pressed, a method that renders it possible to give them more intricate shapes. The accepted designs at present are those of the pressed steel channel of full width (Fig. 1) at the center and tapering at the front for the purpose of giving a wider range of move-

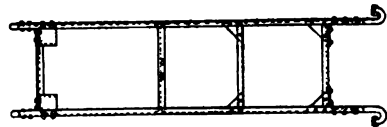


Fig. 1.

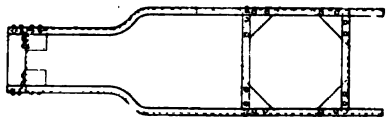


Fig. 2.

ment for the steering wheels and to permit of sharp turning (Fig. 2).

Some leading manufacturers have adopted the practice of dropping the

frame just forward of the rear axle with a view to lowering the center of gravity of the car and bringing the transmission and power shaft in a direct line with the motor; and such practice has recently been carried still farther by giving the frame a double drop, so that the entire center part is at a lower level than the forward and rear end. Some frames are provided with what is termed a "sub-frame," which is usually constructed somewhat lower than the main frame and is designed as a support for the power-plant. See Chassis. (2) Of a boat, the timbers that form the bottom and sides. (3) Of a dynamo, the bed-piece. (4) The supporting parts of a steam engine. (5) A term applied by some manufacturers to one of the side-members of a motor-vehicle frame.

Frame, Cambered.—A motor-vehicle frame, narrowed at the front in order to give the steering wheels wider range of motion and to permit of sharp turning. See Frame (Fig. 2).

Frame, Dropped.—See Frame.

Frame, False.—Same as Sub-frame. See Frame (Fig. 2.)

Frame-hangers.—The same as spring-hangers, q. v.

Frame, Midship.—The traverse section of the maximum width of a motor-boat. The submerged midship frame is that portion of it limited by the plane of the water. In the running of a boat it does not coincide with the midship frame of the hull, but is situated more to the rear, in consequence of a more or less pronounced tendency that a boat has to "squat" at the stern.

Frame, Pedestal.—A motor-car frame provided beneath with U-shaped guides, which embrace the axles, and prevent them from moving in any other than a vertical direction.

Frame, Sub.—See Frame.

Francis, H. M.—Sec. and Treas. General Vehicle Co., Broadway and 62nd St., New York City.

Franco-American Auto Supply Co.—1404-6 Michigan Ave., Chicago, Ill. (Clement-Bayard.) Supply house.

Franco-American Automobile Co.—417 Guy St., Montreal, Canada. Garage.

Franeau, Société Anonyme des Établissements.—15 rue Veyt, Brussels, Belgium. Mfrs. bodies.

Frank, Albert.—Beierfeld, Germany. Mfrs. metallic rims, electric lamps, horns.

Frank, Charles A.—Lawrence, Mass. (Compound.)

Frankfurter Gummiwarenfabrik, Carl Stoeckich.—Frankfurt-Niederror, Germany. Mfrs. pneumatic rubber tires.

Fränkischer Verein für Luftschiffahrt.—(Würzburg Aero Club), Würzburg, Germany.

Franklin Auto Co.—Franklin, Neb. (Holsman.)

Franklin Automobile Co.—Broadway and 73rd St., New York City. (Franklin.)

Franklin Automobile Co.—1450 Michigan Ave., Chicago, Ill. (Franklin.)

Franklin Garage.—1024 Sprague St., Spokane, Wash. (Franklin.)

Franklin Garage.—163 Johns St., Bridgeport, Conn. (Holsman, Crawford.)

Franklin Garage.—Hartford, Conn. Garage.

Franklin Garage.—347 Franklin St., Buffalo, N. Y. Garage.

Franklin, H. H.—Pres. and Gen. Mgr. H. H. Franklin Mfg. Co., 302 S. Geddes St., Syracuse, N. Y.

Franklin, Judge.—Norwalk, Conn. Garage.

Franklin Mfg. Co., H. H.—302 S. Geddes St., Syracuse, N. Y. Makers of the Franklin car; first marketed in 1903. H. H. Franklin, Pres. and Gen. Mgr.; C. H. Stilwell, Vice-Pres.; F. A. Barton, Sec.; H. B. Webb, Treas.; J. Wilkinson, Designer; F. J. Haynes, Supt.; W. G. Lindsey, Purch. Agt.; F. R. Bump, Sales Mgr.; J. E. Walker, Advt. Mgr.

Franklin Moore Co.—Winsted, Conn. Mfrs. bolts and nuts, aluminum, brass, bronze, copper and grey iron castings.

Franklin Motor Co.—Franklin, Pa. (Pope-Toledo.)

Franklin Portable Crane & Hoist Co.—Franklin, Pa. Mfrs. special automobile machinery; portable cranes and hoists.

Franklin, Wm. H.—Hightstown, N. J. (Dragon.)

Frankquist, Edward.—Designer and Supt. Simplex Automobile Co., 614 E. 83rd St., New York City.

Franskin, Felix.—35 rue Memling, Cureghem, Brussels, Belgium. Mfrs. tire pumps.

Frantz Auto Co.—Cherryville, Pa. Mfrs. body rions.

Frantz Body Co., The.—Stanton Ave. and Getz St., Akron, O. Mfrs. automobile bodies and seats. Cap. \$60,000. Est. 1898. J. T. Diehon, Pres.; Louis May, Sec. and Treas.; A. C. Loomis, Gen. Mgr.

Fraser & Reynolds.—214 S. 23rd St., Philadelphia, Pa. (Wayne, American Mercedes.)

Fraser, Charles.—Partner Rittenhouse Garage, 214-20 S. 23rd St., Philadelphia, Pa.

Fraser, H. A.—1010 Broadway, Bay City, Mich. (Waltham.)

Fraser-Hollow Spar & Boat Co.—Greenport, L. I. Mfrs. motor boats.

Frasse & Co., Peter A.—92-4 Fulton St., New York City. Importer tools, machinery, supplies, lubricators.

Frayer-Miller Co.—62nd St. and Broadway, New York City. (Frayer-Miller.) Est. September 1905. H. H. Knepper, Mgr. Repairing Frayer-Miller cars only.

Fraser & Jones Co.—Syracuse, N. Y. Mfrs. malleable iron and steel castings.

Frazier & Frazier.—South Bend, Ind. (Rambler.)

Frederick Co. W. A.—Motor Mart, 16 Columbus Ave., Boston, Mass. (American.)

Frederickson, H. E.—2046-48 Farnham St., Omaha, Neb. (Pierce-Arrow, Buick, Haynes, Wood.)

Fredericksen, Herman-Carl.—39 Roskildevej, Copenhagen, Denmark. Mfrs. motorcycles.

Freeboard.—That part of a boat's side between the water-line and the top of the deck.

Freed, A.—1507 Market St., San Francisco, Cal. (Gale, Merkel, Model.)

Freed & Branford.—Salt Lake City, Utah. (Wayne.)

Freeland Sons Co., B. F.—Sturgis, Mich. Mfrs. gasoline marine motors, tanks, storage tanks.

Freel & Trumpour.—4th and Johnson Sts., Bay City, Mich. (Ford.)

Freeman, A. E.—Pres. Trident Tire Co., 1539 Broadway, New York City.

Freeman, Brewster & McCabe, Inc.—455 Golden Gate Ave., San Francisco, Cal. (Aerocar.)

Freeman, E. J.—Reno, Nev. (National.)

Freeman, F. N.—Gouverneur, N. Y. (Maxwell.)

Freeman, F. P.—Irving St. and Elizabeth Ave., Rahway, N. J. (Ford, Crawford.)

Freeman, Joseph Edwin.—Lawyer. B. Unity, Me., Feb. 14, 1876. Ed. University of Chicago, Ph.B. 1898; Georgetown Law School, L. L. B. 1901, Harvard Law School 1902. President Martini Import Co., Seashore Municipal Railroad Co., director Link Chain Belt Co., Land & Lake Association, Van Ritter Construction Co. Mem. Harvard Club, Bar Association of New York City. Res., 82 Washington Pl., New York. Office, 60 Wall St., New York. Became president of the Martini Import Co. in 1907. Recreations, automobiling, tennis, golf.

Freeman, W. N.—Sec., treas., sales mgr. Mora Motor Car Co., Newark, N. Y.

Freer Gauge Co.—Everett Bldg., Akron, O. Mfrs. gasoline tank gauges.

Freese, A. D.—Nellie, O. (Jewel.)

Freezing.—A term occasionally used in the sense of "seizing." See Seizing.

Fremont Novelty Works.—507 W. State St., Fremont, O. (Pope-Waverley.)

Fremy, E.—57 bvd. du Hainaut, Brussels, Belgium. Mfrs. spark plugs.

French-American Motor Car Co.—40th

St. and Payne Ave., Cleveland, O. Mfrs. gasoline automobiles.

French Battery Co.—Madison, Wis. Mfrs primary batteries.

French Carriage Co.—92 Summer St., Boston, Mass. (Clement-Bayard.)

French Chalk.—See Soapstone.

French, L. E.—205 N. Broad St., Philadelphia, Pa. (Pullman.)

French Mfg. Co.—Grand View Ave. and Robbins St., Waterbury, Conn. Mfrs. brass and copper tubings.

French, O. J.—Concord, N. H. (Waltham.)

French, Warren.—Supt. Badger Brass Mfg. Co., 11th Ave., 36th to 37th Sts., New York City, and Kenosha, Wis.

Frenier & Son, J. H.—Rutland, Vt. (Rambler, Ford.)

Frequency.—The number of periods per second of an alternating current. The form of such current is well known. The "period" consists of two alternances of contrary direction. At low frequencies, lamps, such as arc ones, exhibit luminous fluctuations which are very disagreeable to the eye. In order to prevent these it is necessary to have a frequency of more than 50 periods per second.

Frera, Societa Anonima.—33 via Carlo Alberto, Milan, Italy. Mfrs. motorcycles. (Frera motorcycles.)

Fresche, A.—Pres. New Haven Button Co., New Haven, Conn., and Pres. The F. A. Nieder Co., Inc., Augusta, Ky.

Fréteilliere.—49 rue de Lorraine, Lavallois (Seine), France. Mfrs. elastic wheels.

Fretz, E. S.—Treas. Chadwick Engineering Works, 3207 Spring Garden St., Philadelphia, Pa.

Fretz, E. S.—Sec., treas. and gen. mgr. Light Mfg. & Foundry Co., 509 Queen St., Pottstown, Pa.

Freund, Gustav.—10 Georgenstrasse, Berlin, Germany. Mfrs. radiators.

Freyer, Chas. H.—Marietta, Ga. (Reo.)

Friction.—The resistance offered to the motion of a body when pressed upon the surface of another body, which does not partake of its motion. Friction is of two kinds: (1), "sliding," as when one body glides over another, as in the motion of an axle in its bearing; and (2), "rolling" friction, which occurs when one body rolls over another, as in the case of an ordinary wheel.

Friction is directly proportional to the pressure of the two surfaces against each other. The ratio of the force which must act merely to overcome friction to the pressure is called the "co-efficient of friction."

Friction-brake Contact.—See Ignition.

Friction-clutch.—See Clutch, Friction.

Friction-coupling.—See Coupling, Friction.

Friction-drive.—A system of transmission in which a wheel engages the flat surface of a disk and transmits power by pressure being brought to bear upon the contact surfaces (Fig. 1).



Fig. 2.

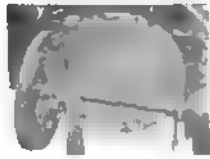


Fig. 1.

Another form of friction drive (Fig. 2) consists of two driving disks, the wheel bearing against both, so that its movement is more positive and there is less danger of slipping.

Friction-gear.—See Gear, Friction.

Friction-rollers.—Small wheels used to support the axle of a larger wheel.

Friction, Rolling.—See Friction.

Friction, Sliding.—See Friction.

Friction-wheel.—See Wheel, Friction.

Frictioned.—A term applied in the rubber tire industry to a fabric which has been impregnated with rubber.

Fridenstine, Fred.—Supt. rep. dept. of H. M. Leonard, 625 Broad St., Elyria, O.

Fried-Krupp Aktien Gesellschaft Germania Werft.—Kiel, Germany. Mfrs. steam commercial automobiles. (Krupp trucks)

Friedlander & Bro., Joseph.—8 Maiden Lane, New York City. Mfrs. eye shields.

Friedrichs und Engelking.—Brackwede, bei Bielefeld, Germany. Mfrs. metallic rims

Friedrich Wilhelm Bertram Söhne.—Remscheid, Germany. Mfrs. tops.

Friel, W. J.—Portsmouth, O. (Ford.)

Fries & Co.—89-93 Main St., Buffalo, N. Y. Mfrs. brass couplings, brass pipe, fittings, brass and copper metals, aluminum and brass castings.

Friet, Otto.—Treas. Empire State Motor Co., 2148 Broadway, New York City.

Frisbie Motor & Machine Works.—Middletown, Conn. Mfrs. gasoline automobile and marine motors.

Fritton, Edward J.—Supt. Covert Motor Vehicle Co., 57-61 Richmond Ave., Lockport, N. Y.

Fritts Hardware Co., T.—Chattanooga, Tenn. (Waltham.)

Fritts, W. H.—Vice-Pres. Kirchdorfer Auto Co., 1700-2 Baxter Ave., Louisville, Ky

Fritz Bros.—19 N. 6th St., Zanesville, O. (Winton, Cadillac.)

Fritz, J. S.—Cambridge, O. Est. July, 1906. Garage, 10 cars. Repairing.

Froelich, Jesse.—Treas. and sec. Times Square Auto Co., 1599-1601 Broadway, New York City.

Froelich, Morris.—Pres. Times Square Auto Co., 1599-1601 Broadway, New York City.

Frohman, Harry.—Sec. The Cincinnati Electric Tool Co., 650-652 Evans St., Cincinnati, O.

Frohman, Sidney.—Sec. Sandusky Foundry & Machine Co., Sandusky O.

Frolicher, John.—Supt. Reliance Automobile Co., 547-57 Fulton St., San Francisco, Cal.

Frommeyer, R. E.—Officer in Schaeffer & Budenburg, Mfg. Co., Foxboro, Mass.

Frontier Automobile Service Co.—437 Pearl St., Buffalo, N. Y. Garage.

Frontier Brass Foundry Co.—Whitney Lane, Niagara Falls, N. Y. Mfrs. brass castings.

Frost, F. E.—505 Main St., Worcester, Mass. (Pierce Racine.)

Froussart, G.—Charleville (Ardennes), France. Mfrs. jacks

Früs, Jul.—6 Osterfarimagsgade, Copenhagen, Denmark. Mfr. tire pumps.

Fry, John E.—1562 Broadway, Denver, Colo. (Apperson.)

Fry, Thomas C.—Sec. and treas. T. C. & W. L. Fry Co., 201 Brighton Ave., Rochester, Pa. (Haynes.)

Fry Co., T. C. & W. L.—201 Brighton Ave., Rochester, Pa. Mfrs. spark plugs. Cap. \$10,000. Est. 1907. John A. Miller, pres.; Thos. C. Fry, sec. and treas.; W. L. Fry, mgr

Fry, W. L.—Mgr. T. C. & W. L. Fry Co., 201 Brighton Ave., Rochester, Pa.

Fudge, Chas. B.—Vice-pres. Muncie Auto Parts Co., Elliott St. and L. E. & W. Yards, Muncie, Ind. (Columbus.)

Fudge, L.—Farmersville, O. (Holman)

Fueburger, Jos.—Vice-pres. Fort Wayne Gear Co., North American Bldg., Fort Wayne, Ind.

Fuhrman & Schmidt.—Commerce St., Shamokin, Pa. Garage.

Fulcrum.—The prop. support, or fixed point upon which a lever is sustained and about which it is supposed to turn freely.

Fuller & Thornton.—2028 Sansom St., Philadelphia, Pa. (Simplex.)

Fuller, Alvan T.—Motor Mart, Park Sq., Boston, Mass. (Packard, Cadillac.)

Fuller & Sullivan.—19 E. Elliott St., Boston, Mass. Mfrs. miscellaneous wearing apparel.

Fuller Co., The G. W.—182 Asylum St., Hartford, Conn. Mfrs. auto trunks and auto racks.

Fuller Co., The.—1619 Broadway, Detroit, Mich. Mfrs. gasoline commercial automobiles.

Fuller, E. B.—Sec. Haverhill Fire Appliance Co., office 40 Merrimack St., factory Island Park, Haverhill, Mass.

Fuller, E. D.—St. Albans, Vt. Garage.

Fuller & Son, John C.—Woodland Works, Wick Lane, Bow, London, England. Mfrs. coils and storage batteries.

Fuller's Earth.—A kind of clay which readily absorbs grease. It is employed for dressing clutch-leathers to prevent them from slipping, particularly if there is any oil upon them.

Fulgarus Gjuleri & Mekineriverk-stadsaktiebolag.—Upsala, Sweden. Mfrs. automobile motors.

Fulmen, Société Nouvelle de l'Accumulateur.—18 quai de Clichy, Clichy, France. Mfrs. storage batteries.

Fulmer, C. F.—Plainfield, N. J. Mfrs. air compressors, spark plugs and spark timing devices.

Fußer, W. H.—Flemington, N. J. (Dolson.)

Fultcher, Joe T.—Gadsden, Ala. Gadsden Garage. (Cadillac.)

Fulton Automobile Co.—103 N. Pryor St., Atlanta, Ga. Garage.

Fulton Foundry & Machine Works.—25 Furman St., Brooklyn, N. Y. Mfrs. gray iron castings. Pattern makers.

Fulton St., Garage Co.—Toledo, O. Garage.

Fulton, Thomas.—Washingtonville, N. Y. Garage.

Funnel.—A conical vessel terminating below in a spout and used for pouring liquid into a vessel which has a small opening. See Tun Dish.

A funnel for gasoline should have an involute rim and a strainer of fine gauze for preventing the entrance of dirt, pebbles, etc., into the vessel to be filled. The involute rim tends to prevent the liquid from spattering over the part of the body that contains the funnel.

Funk Engineering Co.—39-45 14th St., Hoboken, N. J. Mfrs. automobile forgings, crankshafts, gearblanks, German chrome nickel steels, axles, steering knuckles, Bischoff steel connecting rods, etc. Cap., \$100,000. R. W. Funk, pres. and gen. mgr.; Hans Bockhacker, sec. and treas.

Funk, R. W.—Pres. and gen. mgr. Funk Engineering Co., 39-45 14th St., Hoboken, N. J.

Funk, Upton.—Shippensburg, Pa. (Monarch.)

Fur.—The same as boiler "scale." See Scale.

Furan, Société des Ateliers du.—4 rue Barrouin, St. Étienne, Paris, France. Mfrs. transmission gears, automobile motors.

Furbish, Fred A.—28-34 River St., Rumford Falls, Me. Garage.

Furnace, Electric.—An arrangement whereby materials can be submitted to the heat of an electric arc.

Furnish, Ed.—Asst. Supt. Gilbert Mfg. Co., New Haven, Conn.

Fuse.—A piece of metal or wire, called also a "safety fuse," inserted in an electric circuit, of smaller section, or of lower melting point than the connecting wires, so that in case of an excessive current passing, the fuse melts before any damage has been done to the other wires, or to the apparatus.

Fuse-wire.—See Fuse.

Fusibility.—The property by which solids assume a fluid state. The following are the fusing points of some of the metals: Steel, 2550° F. or 1400° C.; aluminum, 1110° F., or 600° C.; bronze, 1650° F., or 900° C.; copper, 1930° F., or 1054° C.; brass, 1860° F., or 1015° C.; soft iron, 2912° F., or 1600° C.; gray iron, 2228° F., or 1220° C.; tin, 443° F., or 226° C.; lead, 635° F., or 335° C.; platinum, 3247° F., or 1775° C.; zinc, 773° F., or 412° C.

Fusible Plug.—See Plug, Fusible.

Futer, B. Franklin.—213 N. Duke St., Lancaster, Pa. (Maxwell, Acme.) Est. Jan., 1904. Garage, 50 cars. Repairing.

Futtocks.—The timbers between the floor timbers and top timbers of a boat.

Fyke, C. V.—Vice-Pres. and Sec. W. R. Demster Machinery Co., N. W. cor. 16th and Walnut Sts., Kansas City, Mo.

G

g.—Symbol for the acceleration produced by gravity, i. e., about 32.2 feet per second.

G. & J. Tire Co., The.—549-625 E. Georgia St., Indianapolis, Ind. Mfrs. automobile, bicycle and motorcycle tires. Member M. & A. M. J. D. Anderson, Pres.; E. S. Benson, Sec. and Treas.; G. H. Hamilton, Sales Mgr. Branches: Boston, Chicago, Cleveland, Detroit, New York, San Francisco. Distributing Agencies: G. & J. Tire Agency, 1528 Court Pl., Denver, Colo.; G. & J. Tire Co., 912 Main St., Buffalo, N. Y.; G. & J. Tire Agency, 711 N. Broad St., Philadelphia, Pa.; Western Rubber and Supply Co., 1010 S. Main St., Los Angeles, Cal.; Omaha Rubber Shoe Co., 11th and Farnum Sts., Omaha, Neb.; Pittsburg Rubber Co., 913-915 Liberty Ave., Pittsburg, Pa.; Enterprise Rubber Co., 110 Federal St., Boston, Mass.; Alexander Elyea Co., 35 N. Pryor St., Atlanta, Ga.; C. H. Mead Supply Co., Portland, Ore.; Plant Bros., 21 S. 2d St., Minneapolis, Minn.; Central Rubber Co., 84 Lake St., Chicago, Ill.; Syracuse Rubber Co., 212-14 S. Clinton St., Syracuse, N. Y.; Rochester Rubber Co., 55 Main St., E., Rochester, N. Y.; Jerome P. Parker Co., 181-3 Madison St., Memphis, Tenn.

Gab.—In a steam-engine, the hook on an eccentric-rod catching on the rock-shaft pin, in a valve-motion.

Gabillon, Jules-Ernst.—218 Chausée de Mons, Brussels, Belgium. Mfrs. radiators.

Gable, A. M.—18 E. Independent St., Shamokin, Pa. (Stanley.)

Gable, Frank.—Box 143, Alamosa, Colo. Est. 1903. Frank H. Gable, Prop. Garage to house 20 cars; repairing.

Gabriel Horn Mfg. Co.—1407 E. 40th St., N. E., Cleveland, Ohio. Mfrs. exhaust horns, shock absorbers and muffler cut-out valves. Member M. & A. M.

Gaeth Automobile Co., Inc., The.—2553 W. 25th St., Cleveland, O. Makers of the Gaeth car; first marketed in 1901. Eleven models made since. Cap. \$100,000. Paul Gaeth, Pres., Gen. Mgr. and Designer; R. E. Hawkins, Vice-Pres. and Sales Mgr.; Frank L. Pierce, Sec. and Treas.

Gadot, A.—90 route de la Révolte, Levallois, France. Mfr storage batteries.

Gaeth, Paul.—Pres., Gen. Mgr. and Designer The Gaeth Automobile Co., Inc., 2553 W. 25th St., Cleveland, Ohio.

Gaffney, E. P.—Pres. Pacific Coast Auto Co., 1416 Broadway, Seattle, Wash.

Gage Bros.—Lakefield, Minn. (Monarch.)

Gagemobile Co.—Saratoga Springs, N. Y. (White.)

Gaggenau, Süddeutsche Automobifabrik.—Gaggenau, Baden, Germany. Mfrs. gasolene automobiles. (Gaggenau cars.)

Gailey Bros.—Cardiff, Md. (Waltham.)

Gaillard's Auto Repair Sta.—265 Havemeyer St., Brooklyn, N. Y. Garage.

Gaines & Whitesell.—1207 Main St., Richmond, Ind. (Stoddard-Dayton, Maxwell, Holsman, White, Pope-Waverley.)

Gainsville Automobile Co.—Gainsville, Fla. Garage.

Gaiser's Garage.—103 Main St., Niagara Falls, N. Y. Garage.

Gaither-Owen Co.—40 W. 60th St., New York City. Mfrs. carbureters.

Gaiter.—See Sleeve. Tire.

Gaither, Wm.—28-30 N. Fountain Ave., Springfield, Ohio. (Franklin, Mitchell.)

Galalith.—A non-inflammable substitute for celluloid, made from casein (or albumin of milk), mixed with chalk or metallic bases. The mixture, made insoluble with formol and then laminated and compressed, can be bored, turned, sawed and polished. It has the appearance of celluloid or horn and can be used for the manufacture of various automobile accessories.

Gale Auto Co.—Prairie St., Galesburg, Ill. (Gale.)

Gale Garage.—1915 S. Hoover St., Los Angeles, Cal. (Gale.)

Gale, John A.—Pres. White Agency, 176 State St., Binghamton, N. Y.

Galena Auto & Garage Co.—Cor. 9th and Main Sts., Galena, Kan. (Pope-Toledo, Pope-Hartford, Northern, Reo.) Est. June 1, 1907. Cap. \$20,000. B. Cooley, Pres. and Treas.; O. W. Sparks, Vice-Pres.; G. H. Cooley, Sec. Garage, 100 cars; repairing.

Gall and Inglis.—Edinburgh, Scotland. Maps.

Gallagher, F. L.—Gen. Mgr. Modern Tool Co., 4th and State St., Erie, Pa.

Gallaher, Edward Beach.—Manager American Branch of the Maja Company, Ltd. B. Paris, France. April 28, 1873.

Ed. New York private schools, Stevens' Institute of Technology (degree of M. E., class 1894). Mem. Touring C. of France (Délégue a New York), Touring C. of Suisse (Délégue pour U. S.), American Society Electrical Engineers, N. Y. Athletic, A. C. A., Larchmont Yacht, N. Y. Press, The Hermit (Cleveland, O.), Aero C. A. Res., Hotel Regent, 70th St. and Broadway; Office, 228-230 W. 58th St., New York City.

Gallagher, J. C.—The Rathburn House, Elmira, N. Y. (Haynes.)

Galloway, G. W.—322 Pearl St., New York City. Mfrs. grease, oils.

Gallerand, H.—Nogent-le-Rotrou, Eure-et-Loire, France. Mfrs. tops.

Galley.—The cooking room on board a boat.

Gallia Electric Co.—43 E. 52nd St., New York City. Garage.

Galloway & Co., W.—Gateshead, England. (Stanley.)

Galloway Co., Wm.—Waterloo, Iowa. (Cadillac.)

Galoisy, Emile.—6 passage d'Isly, Levallois, Seine, France. Mfrs. pressed steel frames.

Galt, C. H.—Agent and Mgr. Carter-car Co., 7 W. 66th St., New York City.

Galvanized Iron.—See Iron, Galvanized.

Galvanizing Co.—525 N. Front St., Philadelphia, Pa. Mfrs. bolts and nuts, carburettors; galvanizing, angle, channel and tee iron and steel; bar iron and steel; washers.

Galvanometer.—An instrument for detecting an electric current, or, within certain limits, for measuring its value. It consists, in principle, of a magnet performing the part of a magnetized needle and a coil through which the current passes. The more intense the current, the greater the deflection or elongation of the needle.

Galveston Motor Car Co.—Galveston, Tex. (Rapid.)

Galvin Co., The J. F.—74-8 Fort St. E., Detroit, Mich. Mfrs. brass, bronze, aluminum and copper castings, gasoline strainers.

Game, Ltd., A. W.—Holborn, London, E. C., England. Mfrs. wearing apparel, coats, hats and caps, fur coats, fur hats and caps; goggles.

Gangloff Fils.—10 bdv. Helvetique, Geneva, Switzerland. Mfrs. bodies.

Gans, E. W.—Treas. and Gen. Mgr. Reliance Motor Car Co., 89 Fort St., E., Detroit, Mich.

Gap, Air.—See Air-gap.

Gap, External.—The same as spark intensified or spark-gap.

Gap, Spark.—See Spark-gap.

Garage.—A depot for the storage (and sometimes repair) of motor vehicles.

Like the terms "chauffeur" and "chassis," "garage" is a loan-word from the French.

Garage Anglo-Mexicano.—Calle de Providencio, Mexico City, Mex. Garage.

Garage Equipment Co.—Milwaukee, Wis. Mfrs. brake locks, brakes, muffler cut-out valves.

Garage Italiano.—Calle de San Diego y Colon, Mexico City, Mex. Repairing.

Garage Metropolitano.—Avenida Patoni y Calle Iturbide, Mexico City, Mex. (Darracq. Brasier, Itala, Cameron, Royal, Stearns, Triumph.)

Garboard.—One of the planks of a vessel's bottom next to the keel.

Garboard-strake.—The row of planks nearest to the keel on the outside of a vessel's bottom.

Garcia, Gomez.—22 Uyvalencia, Barcelona, Spain. Mfr. pneumatic tires.

Gardam & Son, Wm.—45-51 Rose St., New York City. Mfrs. special parts, machine work to order. Cap. \$10,000. Est 1870.

Garden City Garage.—Garden City, N. Y. (American Mercedes.)

Garden City Spring Works.—2000 Purple St., Chicago, Ill. Mfrs. leaf springs.

Gardiner Garage, Arthur.—S. E. Cor. Wisconsin and Exchange Sts., Kenosha, Wis. Garage.

Gardiner Metal Co.—454-6 W. Lake St., Chicago, Ill. Mfrs. babbitt metals, solder.

Gardiner, R. L.—Pulaski, Va. (Wal-tham.)

Gardner & Shearer.—6 Avenida Juarez, Mexico City, Mex. (Franklin.)

Gardner, Lawrence H.—Sec. Geo. N. Pierce Co., 1651 Elmwood Ave., Buffalo, N. Y.

Gardner Motor Co.—4388 Olive St., St. Louis, Mo. Repairing.

Gare Patent Tyre & Wheel Co., Ltd.—15 St. Vincent St., Liverpool, England. Mfrs. pneumatic tires.

Garfield Automobile Co.—1199 Garfield Boulevard, Chicago, Ill. Garage.

Garfield Park Automobile Co.—1891 W. Harrison St., Chicago, Ill. (Lambert.)

Garford, Arthur Lovett.—Manufacturer automobiles and parts. B. Elyria, O., Aug. 4. 1858. Ed. Elyria public school; graduated 1875. President and director of the Garford Co., Cleveland Automatic Machine Co., the Republican Printing Co., the Factory Mutual Insurance Co., director the Perry-Fay Co., the American Lace Co., the Garford Motor Car Co., of New York; the Garford Motor Car Co., of Cleveland; the Worthington Co., the Savings Deposit Bank & Trust Co., member Engineers, of New York; Union, of Cleveland; Elyria Country. Res., 509 Washington Ave., Elyria, O. Office. The

Garford Co., Elyria, O. In the trade since 1901. Used first car 1902. President of Elyria Chamber of Commerce. Trustee of Elyria Library and Memorial Hospital Assn. Recreations, golf and motoring.

Garford Co., The.—Elyria, O. Makers of the Garford car; first marketed in 1903. Five models made since. A. L. Garford, Pres.; Hayden Eames, Gen. Sales Mgr.; C. E. Hadley, Gen. Mgr.; F. N. Smith, Treas.; Carl Neracker, Designer; W. W. Austin, Supt.; F. E. Lytle, Purch. Agt. Branches: The Garford Motor Car Co., Cleveland, O.; A. R. Davis, Sec. and Gen. Mgr. The Garford Motor Car Co. of N. Y., W. B. Hurlburt, eGn. Mgr.

Garford Co.—Elyria, O. Mfrs. axles, brakes, channels, chassis, clutches, automobile gear cases, differential gears, transmission gears, levers, hubs, distance rods, running gears, sprockets, steel wool, steer-wheels, wire wheels.

Garford Motor Car Co., The.—Cleveland, O. (Garford.)

Garford Motor Car Co. of New York.—1540-2 Broadway, New York City. (Garford.) Est. 1899. Cap. \$300,000. W. B. Hurlburt, Pres. and Gen. Mgr.; C. R. Teaboldt, Sec., Treas. and Asst. Mgr.; S. J. Wise, Sales Mgr. Repairing.

Garland, R. F.—St. Paul, Minn. (Maxwell.)

Garlick-Auto Prop. Co.—Madison Ave. and Broadway, Paterson, N. J. Mfrs. jack. (Mason, Cadillac, Franklin, Haynes.)

Garlock & Co., O. J.—Palmyra, N. Y. (Peerless.)

Garlock Packing Co., The.—534 Elliott Sq., Buffalo, N. Y. Mfrs. packing.

Garner, A. B.—Sec., Vice-Pres. and Treas. Murphy Varnish Co., Newark, N. J.

Garnet-paper.—A kind of sand-paper used as an abrasive.

Garnier, E.—19 rue de la République, Orleans, France. Mfr. tire pumps.

Garnier, P.—16 rue Taitbout, Paris, France. Mfr. speed indicators.

Garrabrant, Arthur L.—Newark, N. J. (Haynes.)

Garret Engine Works.—Quincy St., Garret, Ind. Repairing.

Garretson Auto & Cycle Co.—132 Main St., Somerville, N. J. (Franklin, Oldsmobile.)

Garrity & Co., T. C.—Vesper, Kan. (Waltham.) T. C. Garrity, Gen. Mgr. Repairing.

Garrity, T. C.—Buyer and Mgr. T. C. Garrity & Co., Vesper, Kan.

Garrod, W. J.—Supt. and Pur. Agt. Holsman Automobile Co., 662 Monadnock Block, Chicago, Ill.

Gartin, Burt & Adams.—Salida, Colo. (Franklin.)

Gartland, H. J.—Pres. Scovill & Peck, 15 Wooster St., New Haven, Conn.

Garvin Machine Co.—Spring and Varick Sts., New York City. Mfrs. special automobile machinery, circulation pumps.

Gas.—A general term for all those elastic fluids which are permanent under a considerable pressure, and at the temperature of zero of Fahrenheit. In many of them, however, by the joint influence of excessive cold and pressure, the repulsive state of the particles may be balanced or subverted so as to transform the elastic gas into a liquid or solid. The volume of any gas is, generally speaking, inversely as the pressure to which it is exposed. Thus, under a double pressure its bulk becomes one-half; under a triple pressure, one-third, and so on. All gases expand the same quantity by the same increase of temperature, which from 32°

180
to 212° F. = $\frac{480}{180} = 2.3$, or 100 volumes becomes 1.375. For each degree of Fahrenheit the expansion is $\frac{1}{480}$.

Gas-carbon.—See Carbon, Gas.

Gas-engine.—A term often used as a synonym for internal combustion motor, but, properly, a motor using gas supplied by a separate plant.

Gas Engine, The.—514 Main St., Cincinnati, O. Pub. monthly by The Gas Engine Pub. Co.

Gas Engine & Power Co. & Chas. L. Seabury Co.—Morris Heights, N. Y. Mfrs. steam engines, motor boats. body irons, gasolene marine motors.

Gas, Producer.—A mixture consisting essentially of hydrogen, oxides of carbon, nitrogen, etc., formed by blowing air through red-hot coke, coarse coal, or other carbonaceous fuel. It is used for driving gas-engines.

Gasket.—A ring of compressible material, such as sheet asbestos, soft metals or copper, inserted between joints to make them gas or water-tight.

Gasket Supply Co.—1516 Sansom St., Philadelphia, Pa. Mfrs. gaskets.

Gaskins, R. L.—Suffolk, Va. (Maxwell.)

Gasolene.—A volatile distillate from crude petroleum, possessing a specific gravity ranging from the highest grade of about 88° Baumé down to 68°, or with a specific gravity range in the ordinary hygrometer-scale between 0.68 and 0.70. That having a specific gravity of 76° B., or .68 to .70, is the usual internal-combustion motor fuel. The boiling-point of gasolene ranges from 120° to 250° F., with an average range between 149° and 194° F. The vapor of gasolene is 3.05 times as heavy as that of air. Its calorific power is between 18,000 and 20,000

British thermal units. It is popularly supposed that gasoline is an explosive and will "go off" like gunpowder at the touch of a spark, but the fact is that while it will readily ignite from a blaze and burn, it will not "explode," although, when vaporized and mixed with air in the proper proportions, it will, when ignited in the cylinder of a gas-motor, produce a violent expansion of the gas, erroneously called an "explosion."

When gasoline accidentally catches fire the only thing to be done is to smother the flame. The most effectual way to do this is to throw dry sand or salt upon it. In all places where gasoline is stored a quantity of sand or salt should be kept on hand for such an emergency.

Gasoline sometimes contains a certain amount of water, which can be entirely removed from it by straining it through a large funnel fitted with a chamois skin before filling the tank. This not only removes the water, but also any particles of dirt that might be present, and which, working their way into the carburetter, would have a tendency to obstruct the spray nozzle, while water, in any appreciable quantity, would affect the operation of the carburetters. See Naphtha.

Gas Power.—St. Joseph, Mich. Pub. monthly by the Gas Power Pub. Co.

Gassing.—See Boiling.

Gassman, E.—Chief Ingenieur, Lavalette & Co., 112-14 W. 42nd St., New York City.

Gast, Madam du.—(Widow of Camille Crespin du Gast); 12 Rue Leroux, Paris.



A noted sporting woman; drove an automobile in the Paris-Berlin, Paris - Vienna and Paris-Madrid races. Has made numerous balloon ascensions, experiments in hovering flight, and parachute descents. Made captain of river

navigation and ran the Algiers-Toulon race in the "Camille." She is an ardent horsewoman and has won numerous prizes and medals in France and Belgium. She is a member of numerous sporting societies.

Gate.—The channel, called also "in-gate," "tedge," "runner" and "sprue," by which metal is poured into a mould.

Gate-quadrant.—See Quadrant, Gate.

Gate-valve.—See Valve, Gate.

Gate City Motor Car Co.—708 Empire Bldg., Atlanta, Ga. (Dragon.)

Gate City Motor Car Co.—815 Main St., Keokuk, Ia. (Nationai, Rambler.)

Est. 1904. L. H. Ayer, Jr., Mgr. Repairing.

Gates, Clyde A.—Sec. and Mgr. Sioux Falls Auto & Supply Co., 112-14 N. Main St., Sioux Falls, S. Dak.

Gates, C. S.—Westminster St., Bellows Falls, Vt. (Ford, Rambler, Jackson.) Supplies, repairs.

Gates, Geo. W.—35 Aren St., Hartford, Conn., and Windsor Locks, Conn. (Pope-Waverley, Franklin.) Garage.

Gates, L. Frank.—Oshkosh, Wis. (Premier.)

Gates, M. C.—Treas. Baldwin Chain & Mfg. Co., 199 Chandler St., Worcester, Mass.

Gathout, Chas. W.—160 Broad St., Newark, N. J. (Jackson.)

Gauge.—A synonym for "tread" and "track," q. v.

Gauge-cock.—See Cock, Gauge.

Gauge-lamp.—See Lamp, Gauge.

Gauge, Micrometer.—A form of screw gauge made with jaws sufficiently wide to permit of its use as a caliper for measuring with great accuracy the external dimensions of objects.

Gauge, Plate.—A gauge with notches of known width for gauging the thickness of plates.

Gauge, Plug.—A cylindrical piece of metal accurately turned to a given size and used as a standard of measurement.

Gauge, Pressure.—A device for showing the actual air pressure in a pneumatic tire. (2) See Manometer.

Gauge, Steam.—An instrument for showing the pressure of the steam within a boiler.

Gauge, Water.—A dial fixed to the dash of a motor vehicle and showing the pressure of the water in the circulating system due to the pump. (2) An instrument for showing the height of water in a steam boiler.

Gauge, Wire.—A tool for measuring the diameter of round wire, of the thickness of metal plate. The numbers and diameters, in fractions of an inch, of some of the principal sizes, according to the American gauge are: No. 0, .325; No. 1, .289; No. 2, .257; No. 4, .204; No. 6, .162; No. 8, .128; No. 10, .102; No. 12, .08; No. 14, .064; No. 18, .0508; No. 20, .03196; No. 25, .0179; No. 30, .01.

Gauger, Grant.—229 Court St., Kanakee, Ill. Garage.

Gaulios Tire Co.—1739 Broadway, New York City. Mfrs., Jobbers and Agents, tires, tubes and tire accessories. Est. 1905. R. H. Weaver, Mgr.

Gausler & Starr.—Philadelphia, Pa. Mfrs. automobile robes.

Gauss.—The C. G. S. unit of magnetic induction or magnetic flux.

Gausset, Fernand.—5 rue du-Jardin-Botanique, Liege, Belgium. Mfrs. wearing apparel, fur hats, caps, coats.

Gauthier et Trentelivres.—30 rue de Malines, Brussels, Belgium. Mfrs. coils, chains, lubricators, oil and acetylene lamps.

Gauthier Frères.—38 rue Balay, St. Etienne, France. Mfrs. differential gears.

Gautier & Co., D. G.—20 Cliff St., New York City. Mfrs. drop forgings, gear blanks, chrome-nickle steel.

Gautier, Paul.—11 rue Taine, Paris, France. Mfrs. automobile motors and transmission gears.

Gauze, Wire.—A fabric woven from wire and used as a straining material in funnels, etc.

Gavitt Auto & Supply Co.—Newton, Kan. (White.)

Gawthorp & Wister.—244 N. Broad St., Philadelphia, Pa. (Elmore.)

Gay et Bourgeons.—63 rue Louis-Blanc, Lyon, France. Mfrs. tubular frames.

Gay, R. A.—Effingham, Ill. (Waltham) Est. 1905.

Gay, R. H.—Sec. Columbia Lubricant Co. of New York, 78 Broad St., New York City.

Gay, Tony.—Thoissey, Ain, France. Mfrs. wearing apparel, fur hats, caps and coats.

Gaylord Co., F. L.—Ansonia, Conn. Mfrs. brass, bronze, aluminum and copper castings, tire chains.

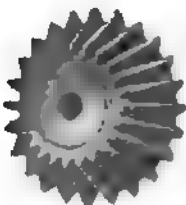
Gaylord, E. P.—Prop. Ideal Carriage Washer Co., 383 Main St. E., Rochester, N. Y.

Gaylord, H. B.—Advt. Mgr. Ideal Carriage Washer Co., 383 Main St. E., Rochester, N. Y.

Gazzetta Dello Sport.—Pub. at 10 via Santa Radegonda, Milan, Italy.

Gear, Annular.—A gear-wheel, called an "internal gear," provided with teeth on the inner side of its rim.

Gear, Balance.—See Gear, Differential.



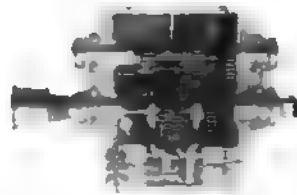
Gear, Bevel.—A gear-wheel, called also "conical gear," cut upon the surface of a cone or part of a cone and used for transmitting motion at an angle.

Gear, Cam.—The gear employed to drive a camshaft.

Gear-case.—The box or case containing the gear-change mechanism.

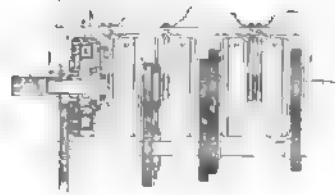
Gear, Change-speed.—A system of gear-wheels which permits the driving

shaft to be driven at varying velocities



while the velocity of the motor-shaft remains constant.

Gear, Change-speed, Magnetic.—An arrangement in which the change of speed is effected by means of magnetic plates, with which each speed is provided. The magnetic gear, which may be made either for a cardan or chain drive, is arranged as follows (see figure): Two plates of magnetic steel are placed opposite each



other at a short distance. One of the two is hollowed out to contain the winding necessary to pass a current of electricity round it and magnetize it. When this current, which is produced by a dynamo or accumulators, is allowed to pass through the wire, the two plates are attracted in a manner sufficiently powerful to obtain adherence. The pinions remain always in gear, but are free to revolve round the first speed shaft, except when the two plates corresponding to each separate speed are attracted together magnetically. Since the first speed pinion is attached to one of the plates, and since the other plate is attached to the first speed shaft, it will be seen that when these two plates adhere together the first speed pinion corresponding to them becomes operatively connected to the first speed shaft and drives the second speed shaft, which, in its turn, actuates the differential gear and turns the road wheels.

Gear, Clash.—The same as "sliding gear, q. v."

Gear, Compensating.—The same as

Gear, Conical.—The same as bevel-gear.

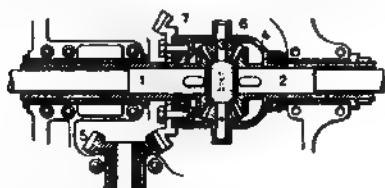
Gear, Crypto.—The same as planetary gear, q. v.

Gear Cutters.—Milling wheels or circular-toothed cutters used for forming or finishing off the teeth of gear-wheels.

Gear, Differential.—A mechanism, called also "balance gear" or "compensating gear," permitting the wheels of an automobile to revolve at different speeds

when turning a corner, and consisting of a train of mechanism connecting the two halves of the rear, or driving axle, with the shaft which transmits the power from the motor. The gear is so constructed that both driving-wheels revolve together when running straight forward.

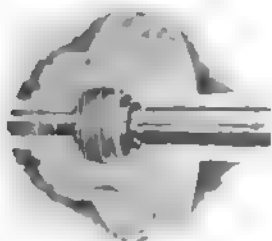
The accompanying figure shows a bevel differential forming part of the change-gear in a chain-driven car. The separate shafts, 1 and 2, respectively, are



operatively connected to the driving-wheels by chains driving on pinions at the end of each shaft. At their interior end they carry planet bevels, 6, movable on the arms, 3, 3, of a spider mounted loose on the ends of the shafts, 1 and 2, to the interior of the bevel-pinions. This spider is driven by the case 4, or the differential box, on which pivot the arms 3. The box, 4, is operatively connected with the wheel, 7, driven by the pinion, 5. The box terminates in long bushes, serving as guides for shafts, 1 and 2. When the car is running straight ahead, the angular velocities of its wheels are equal, and the same is the case with those of the shafts, 1 and 2. It follows that the epicyclic train formed by the bevel pinions, 6 6, turns at the same speed as the box that carries them. If the car makes a turn, the wheel on the inside of the curve will turn less rapidly than the other, and the same will be the case with the corresponding shafts, 1 and 2.

Under such circumstances the angular speed of the case is neither the speed of one shaft nor that of the other, but equals the mean of the angular speeds of shafts 1 and 2.

One of the several objections to the differential gear is that if one wheel strikes a slippery spot and slips back-



ward, no power is transmitted to the other wheel, and propulsion ceases; this being due to the fact that the slipping wheel moves at double the angular veloc-

ity of the sprocket instead of at the same velocity as would be the case if both wheels were revolving at the same velocity. In the device illustrated herewith, the Hedgland solid axle, this trouble is obviated, and both wheels are driven alike. In rounding a curve, when the outer wheel is called upon to exceed the speed of the inner wheel, it automatically disengages and runs free of the axle until the axle catches up with it, when it again engages. The car is always driven square from behind. On a curve, the inner wheel does the driving, and counteracts the throw of the machine. The differential gear drives the wheel that is meeting the less resistance, which means that the wheel in difficulty quits work. But on the axle under consideration neither wheel can quit work until it is running faster than the axle is driving it. It is claimed that this device prevents skidding, which is mainly due to the differential gear.

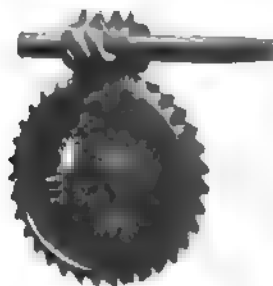
Gear, Elliptical.—A wheel, called also a "face-gear," having teeth upon the flat surface instead of upon the periphery.

Gear, Epicyclic.—The same as planetary gear q. v.

Gear, Face.—See Elliptical Gear.

Gear, Friction.—Wheels which are caused to rotate together by the friction of one on the other, instead of by means of teeth.

Gear, Helical.—A gear in which each tooth forms part of a screw-thread of a very great pitch and the formation of



which makes it cross the face of the wheel diagonally.

Gear, Herring-bone.—A gear-wheel provided with V-shaped teeth on its periphery, and affording a perfectly smooth and even drive.



Gear, Idler.—A gear, called also an "intermediate gear," which runs between two other gears to increase the distance between their centers or change their direction of revolution.

Gear, Intermediate.—The same as Idler-gear, q. v.

Gear, Internal.—The same as annular gear, q. v.

Gear, Jack-in-the-box.—The same as differential gear, q. v.



Gear, Miter.—A bevel-wheel which is used when it is required to change the direction of motion 90° without altering its angular velocity, a case which occurs very frequently in practice.

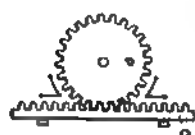
Gear, Nest.—A set of inclosed gear-wheels.

Gear, Pinion.—See Pinion.

Gear, Planetary.—A number of small gears meshing with a large internal gear. The forward and reverse speeds are obtained by bringing these gears into action by means of a system of clutch-bands. On the high speed all

gears are locked and the transmission revolves as a unit.

Gear-pump.—See Pump, Gear.



Gear, Rack.—A straight bar of metal (see figure), provided with teeth; when it is curved on a pinion it forms an annular gear.

Gear, Reversing.—Any mechanism for reversing the direction of rotation. In a steam-engine it usually consists of link-motion or a loose eccentric; in other machinery, of belts and counter-shafts or of trains of gear-wheels.

Gear, Roller.—A system of gear-wheels provided with small rollers instead of teeth, in order to reduce friction.

Gear, Running.—The frame, springs, axles, motor and other parts of a vehicle, except the body.

Gear, Segment.—A gear, sometimes called a "sector-gear," of which the form is a sector of a spur-gear having teeth extending over the arc of a circle only.

Gear, Silent.—A gear-wheel made of rawhide or fiber.

Gear, Skew.—A form of gear-wheel used for transmitting a uniform velocity-ratio between two axes which are neither parallel nor intersecting.

Gear, Sliding.—A type of change-speed gear consisting of a number of gear-wheels of different diameter, which, actuated by the driver through a handle-lever which controls a fork, are capable of moving over a part (of square section) of the principal shaft of the speed-box. These gear-wheels are thus successively made to mesh with one of the toothed wheels which are mounted on

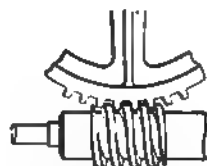


a shaft parallel with the one that carries the sliding train. In the figure, representing diagrammatically a two-speed box, the square shaft, A, actuated by the motor, carries a train of two gearings. E and M, connected by a sleeve. These two toothed wheels, E and M, can, through the lever L and fork F, be moved either to the right or left and be brought into contact with one or the other of the two toothed wheels, C and D, keyed upon the shaft, B, which will thus transmit different speeds to the wheels according to the will of the driver. If the toothed wheels, E and M, occupy the positions that they do in the figure they will naturally have no action upon the wheels, C and D, and the vehicle will be at a standstill.

There are change-speeds with one, two and three sliding trains. Those with two and three are evidently more complicated, but they offer the great advantage of necessitating but very short, and consequently, very strong shafts that are not much subject to vibration, the principal cause of the noise of gearings.

Gear, Speed.—The same as change-speed gear.

Gear, Spiral.—A type of gearing having teeth following a helical path and employed for the transmission of small power to a shaft set at an angle to the driving shaft.



Gear, Spur.—A wheel in which the teeth are arranged around its periphery in the direction of radii from its centre.

Gear, Steering.—The gear by which the motion of the steering-pillar is transmitted to the steering-rod. The three principal forms are the worm and sector, worm and nut, and rack and pinion. Of these, the first is the one most generally adopted. It gives a good positive control with a minimum of effort, and is irreversible, which means that motion cannot be transmitted back from the wheels to the hand of the driver. At the base of the steering-pillar in this form of gear, is a worm of coarse pitch which meshes



Fig. 1

with a sector (see Fig. 1), so that a greater revolution around the center of the gear is produced by the two or more turns of the steering-pillar. The whole is enclosed in a case filled with heavy oil or grease. Attached to the sector is an arm connected by a ball and socket joint (Fig. 2), or a knuckle-joint, to the steering-rod. The advantage of this arrangement, known as "lock-steering," is that

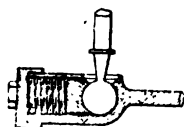


Fig. 2.

the worm locks the front wheel of the vehicle in position against obstacles or causes other than the will of the driver. The worm and nut type of gear consists of a forged steel screw of coarse pitch attached to the lower end of the steering-pillar and on which is placed a steel nut which is so affixed that it cannot revolve around the screw. Two blocks resting on pins, which are part of the nut, carry a yoke communicating by crank to a rod which attaches to the steering-knuckle on the right front wheel. As the steering-pillar rotates to the right or left, the screw moves up or down, carrying along the blocks and a hinged lever, which takes the place of the lever on the sector in the case of the worm and sector. Fig. 3 represents a steering-gear of quite novel construction devised by the Brown & Lipe Gear Co. Its novel feature consists in an internal worm cut on the inner surface of a cup attached to the steering-pillar. This worm meshes with a gear on the shaft of which is the steering-arm which is connected to the steering-lever of the front wheels. The cup containing the worm-gear is filled with oil, and consequently has but very little wear. One and a half turns of the steering-wheel operate the lever its full throw of 90°. The device is self-locking and irreversible, so that it is impossible for the front wheels to change their course if they run against an obstruction on the road. (2) The mechanism for moving the rudder of a vessel.

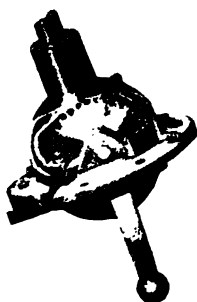


Fig. 3.

the worm locks the front wheel of the vehicle in position against obstacles or causes other than the will of the driver. The worm and nut type of gear consists of a forged steel screw of coarse pitch attached to the lower end of the steering-pillar and on which is placed a steel nut which is so affixed that it cannot revolve around the screw. Two blocks resting on pins, which are part of the nut, carry a yoke communicating by crank to a rod which attaches to the steering-knuckle on the right front wheel. As the steering-pillar rotates to the right or left, the screw moves up or down, carrying along the blocks and a hinged lever, which takes the place of the lever on the sector in the case of the worm and sector. Fig. 3 represents a steering-gear of quite novel construction devised by the Brown & Lipe Gear Co. Its novel feature consists in an internal worm cut on the inner surface of a cup attached to the steering-pillar. This worm meshes with a gear on the shaft of which is the steering-arm which is connected to the steering-lever of the front wheels. The cup containing the worm-gear is filled with oil, and consequently has but very little wear. One and a half turns of the steering-wheel operate the lever its full throw of 90°. The device is self-locking and irreversible, so that it is impossible for the front wheels to change their course if they run against an obstruction on the road. (2) The mechanism for moving the rudder of a vessel.

Gear, Sun and Planet.—The same as epicyclic gear.

Gear, Timing.—A device whereby the inlet and exhaust valves are made to open and close at the proper time.

Gear, Two-to-one.—In a four-cycle motor, the system of gears which drives a half-speed cam-shaft.

Gear, Worm.—A gear having teeth cut in a diagonal direction across its face.

Gearing.—A general term employed to denote a combination of mechanical organs interposed between the prime mover and the working parts of machinery. The signification, however, is frequently restricted to the series of toothed wheels by which the motion is conducted from one revolving axis to another, independently of the shaft and bearings that support them. The toothed wheels are said to "gear" or be "in mesh" when their teeth are engaged, and to be "out of gear" when separate and, consequently, out of action.

When two wheels gear, the one communicating motion is the "driver" or "leader," and the wheel impelled the "follower." Cast iron gear-wheels of all sizes above, and frequently below 18 inches in diameter are made with "arms," the number of which increases with the diameter of the wheel; but in the very small sized gears the arms are commonly omitted, and the rim and teeth are united to the central boss surrounding the "eye" by a thin continuous plate called a "web." Wheels of this kind are usually termed "plate-wheels." The flat arms or spokes of gear-wheels of larger size are cast with longitudinal "ribs" or "feathers" in order to give them greater strength. (2) A gear-wheel.

Gearless Transmission Co.—Rochester, N. Y. Makers of the Gearless car; first marketed in 1907. Three models made since. Cap. \$300,000. Julius Jackson, Pres.; J. W. Breyfogle, Vice-Pres. and Treas.; Burtin F. Kinsman, Sec.; George D. Wilcox, Gen. Mgr., Sales and Advt. Mgr.; Felix A. Eisner, Designer and Engineer; Thomas Corkhill, Supt.

Gebhart, E.—Whitesville, Mo. (Holzman.)

Geen Electrical Mfg. Co.—180 Lake St., Chicago, Ill. Mfrs. and jobbers dry batteries, spark coils, spark plugs, timers, volt and ammeters, wire, battery connections, carburetters. S. B. Geen, Pres.; C. Spanier, Sec.; H. Duginer, Treas.

Geen, S. B.—Pres. Geen Electrical Mfg. Co., 180 Lake St., Chicago, Ill.

Geer Co., Harry R.—St. Louis, Mo. Mfr. motorcycles.

Geisel Automobile Co.—36 Dwight St., Springfield, Mass. (Winton.)

Geissberger.—Zürich, Switzerland. Bodies.

Geiszler, Alois.—Treas. Geiszler Bros., 316 W. 42nd St., New York City.

Geiszler Bros.—316 W. 42nd St., New York City. Mfrs. storage batteries and storage battery igniters. Est. Oct., 1903. Experimented for 3 years. Product marketed April, 1907. Martin Geiszler, Jr.

Inventor and Mgr.; Alois Geiszler, Treas. Partnership.

Geiszler, Martin, Jr.—Inventor and Mgr. Geiszler Bros., 316 W. 42nd St., New York City.

Geitz, Fred.—205 N. Main St., St. Louis, Mo. (Holsman.)

Gem City Automobile Co.—114 N. 7th St., Quincy, Ill. Garage.

Gem Cycle Exchange.—73 Borden Ave., Long Island City, N. Y. Garage.

Gem Mfg. Co.—Spruce, nr. 33rd St., Pittsburg, Pa. Mfrs. buffing machines, flexible drilling machines, oil cans, flexible shaftings.

Gemehl, Camile.—1406 Chancellor St., Philadelphia, Pa. Garage.

Gemmer Mfg. Co.—Detroit, Mich. Mfrs. steering apparatus.

General Accumulator & Battery Co.—152 2nd St., Milwaukee, Wis. Mfrs. storage batteries.

General Automobile Supply Co.—1671 Broadway, New York City. Supplies.

General Drop Forge Co.—1738 Elwood Ave., Buffalo, N. Y. Mfrs. drop forgings.

General Electric Co.—Lynn, Mass. Mfrs. electric generators.

General Electric Co.—Schenectady, N. Y. Mfrs. mercury arc rectifiers, motor generators. Cap. \$80,000,000. Est. 1893.

General Mfg. Co.—Elkhart, Ind. Mfrs. clutches, transmissions, drills. Contract work. Cap. \$50,000. Est. 1906. D. E. McCarthy, Pres. and Treas.; Chas. G. Stevens, Vice-Pres.; A. D. Dorman, Sec.; A. L. Andrews, Factory Supt.; Alex. Miller, Bookkeeper and Cashier.

General Mercantile Co.—905-6 Mutual Life Bldg., Buffalo, N. Y. Mfrs. belting.

General Motor Car Co.—249 N. Broad St., Philadelphia, Pa. (Autocar.)

General Motor Car Co.—14th and Valencia St., San Francisco, Cal. (Locomobile, Fiat.)

General Power Co., The.—100 William St., New York City. Mfrs. charging apparatus.

General Vehicle Co.—Sales Dept., Broadway and 62nd St., New York City. Factory, Long Island City. Succeeded Vehicle Equipment Co., June 1, 1906. Makers of Electric carriages and wagons for all purposes. Cap. \$450,000 preferred stock. \$450,000 common stock. S. Z. Mitchell, 1st Vice-Pres.; J. Howard Hanson, 2nd Vice-Pres.; H. M. Francis, Sec. and Treas.; Robert M. A. Floyd, Gen. Mgr.; G. W. Wesley, Supt.; F. F. Phillips, Sales Mgr.

Generator, Acetylene.—An apparatus for producing acetylene gas by the action of water on calcium carbide, in quantities sufficient to supply one or more lamps. The carbide is either fed into the water or the water allowed to

drip upon it. It is the "gas-works," so to speak, of the motor-vehicle, and which supplies the headlights.

Generator, Attached.—An acetylene generator directly attached to or forming part of a lamp.

Generator, Electric.—Any apparatus that produces electricity. The kinds distinguished are:

(a) Mechanical generators; dynamos or alternators; (b) thermal generators; thermo-electric batteries that directly convert heat into electricity; (c) chemical generators; hydro-electric or batteries with fused salts as an electrolyte.

Accumulators are simply transformers, and not electric generators, since their function is to store up and then give out electric energy.

Generators, Primary.—See Primary Generators.

Generator, Steam.—See Boiler.

Generator-valve.—See Carburetter.

Genesee Motor Vehicle Co.—Court and Exchange Sts., Rochester, N. Y. (Corbin.)

Geneva Automobile Club.—Geneva, N. Y. Organized May 17, 1904. "to promote automobilists interests." Seventeen charter members. Officers: F. W. Herenden, Pres.; M. F. Blaine, Vice-Pres.; C. W. Fairfax, Sec. and Treas. Former Pres. H. L. Rose.

Geneva Automobile Co.—145 Castle St., Geneva, N. Y. (Cadillac.) Repairing; garage; supplies.

Gentil et Cie.—4 bvd. Bourdon, Neuilly, France. Mfrs. Alcyon motorcycles.

Geometric Tool Co.—Blake and Valley Sts., New Haven, Conn. Mfrs. special automobile machinery.

George, Albert.—67 rue du Téléphone, Brussels, Belgium. Mfrs. speed indicators.

George, Edwin S.—Detroit, Mich. (Oldsmobile.)

Georgi, C. E.—Officer of Schaeffer & Budenburg Mfg. Co., Foxboro, Mass.

Gérard.—36 rue des Guides-Carrières, Paris, France. Mfrs. solid tires.

Gerard & Hall.—Huntington, N. Y. (Aerocar.)

Gerard, William R.—Journalist. Member of the staff of Automobile Topics. Compiler of the technical portion of the International Motor Cyclopaedia.

Gere Launch & Engine Works.—Yonkers, N. Y. Mfrs. motor boats.

Gerhah, Jacob.—158-64 N. 3rd St., Philadelphia, Pa. Mfrs. drop forgings, cloth and carpet trimmings.

Gerkinet, Josef.—rue Hayeneux, Herstal, Belgium. Mfrs. motorcycles.

Germain, Société des Ateliers.—Monceau-sur-Sambre, Prés Charleroi, Belgium. Mfrs. gasoline automobile and commercial vehicles, automobile and marine motors..

German Silver.—An alloy of copper (50 to 60 per cent.), nickel (15 to 25 per cent.), and zinc (15 to 20 per cent.). A German silver containing from 1 to 2 per cent. of tungsten is called "platinoid." These alloys have a high electrical resistance.

Germantown Garage.—6225 Germantown Ave., Philadelphia, Pa. Garage.

Gérme, Ch.—37 rue Godot de Mauroy, Paris, France. Mfr. carbureters.

Gernsboick, Hugo.—Officer and Gen. Mgr. Royal Battery Co., 108-10 Duane St., New York City.

Gerome, T. F.—130-2 W. 18th St., New York City. Est. 1900. Garage, 50 cars; repairing.

Gerrie, John Howard.—Automobile editor New York Herald. B. Whitby, Ont., Can., Oct. 22, 1870. Ed. college at Hamilton, Stratford and Toronto, Can. Placed in charge of automobile news in New York Herald in 1897 and has been in charge ever since. Mgr. Importers' Automobile Salon, 1904-5. Previously was sporting editor Toronto Mail and Empire.

Gerrish, W. A.—First Ave. and Railway St., Enderlin, N. D. (Mitchell.) Est. 1906.

Gerson-Carey Co.—Kalamazoo St. and L. S. and M. S. R. R., Lansing, Mich. Mfrs. brass, manganese-bronze, phosphon-bronze and aluminum castings, patterns (metal and wood). Cap. \$15,000. Est. 1901. J. J. Carey, Pres. and Supt.; Jos. Gerson, Sec., Treas. and Sales Mgr.; Irving A. Murphy, Pur. Agt.

Gerson, Jos.—Sec., Treas. and Sales Mgr. Gerson-Carey Co., Kalamazoo St. and L. S. and M. S. R. R., Lansing, Mich.

Gery, J. B.—Pres. Berwin Automobile Co., 128-132 N. 8th St., Allentown, Pa.

Gesellschaft der Russisch-Französischen Gummii Guttapercha und Telegraphenwerke.—Riga, Russia. Mfrs. pneumatic tires.

Getchell, C. D.—Houlton, Me. (Cadillac.)

Getchell & Sons, S. C.—Woonsocket, R. I. Mfrs. tanks, storage tanks.

Geutach, Frank F.—Sec., Treas. and Gen. Mgr. Puncture Proof Tire Co., Guardian Bldg., Cleveland, O.

Gever, Clinton.—Muncy, Pa. (Cadillac.)

Gfrorer, J. F.—Auditor Palmer & Singer Mfg. Co., 1620-24 Broadway, New York City.

Gianoli, L.—26 bvd. Magenta, Paris, France. Mfrs. primary batteries, spark plugs, coils, high and low tension magnetos.

Gianoli, Luigi, filiale.—48 via Solferino, Milan, Italy. Mfrs. make and break plugs.

Gib.—A bar of metal with its ends bent at right angles to its length; used

with a cotter for holding in place the loose strap on the end of certain forms of connecting-rod.

Gibaud.—309 Faubourg St. Antoine, Paris, France. Mfrs. high and low tensioned magnetos.

Gibbs-Brower Co.—150 Nassau St., New York City. Mfrs. turntables.

Gibney & Bros., Jas. L.—211-213 N. Broad St., Philadelphia, Pa. Est. 1900. Supply house, handling tires and accessories. Jas. L. Gibney, Pres.; C. H. Walz, Gen. Mgr. and Mgr. Accessory Dept. Mfrs. Eleck-trick vulcanizers.

Gibney, Jas. L.—Pres. Jas. L. Gibney & Bros., 211-213 N. Broad St., Philadelphia, Pa.

Gibson & Walker.—Portland, Ore. (Dolson.)

Gibson Auto Co.—238 Mass. Ave., Indianapolis, Ind. (Ford, Marmon, Premier.) Est. 1900. Cap., \$10,000. E. M. Gibson, Pres.; C. Bauer, Sec. and Treas.; Cecil E. Gibson, Gen. Mgr. Repairing.

Gibson Co., Wm. D.—Huron and Kingsbury Sts., Chicago, Ill. Mfrs. springs, gasoline motors, machinery. Cap., \$50,000. Est. 1873. Silas Howe, Pres. and Treas.; Enoch Peterson, Vice-Pres. and Sec.

Gibson, John J.—Mgr. Buffalo Auto Exchange, 401 Franklin St., Buffalo, N. Y.

Gies, C. J.—Sec. Gies Gear Co., 345-347 Bellevue Ave., Detroit, Mich.

Gies, F. G.—Vice-Pres. Gies Gear Co., 345-347 Bellevue Ave., Detroit, Mich.

Gies Gear Co.—345-47 Bellevue Ave., Detroit, Mich. Mfrs. marine reverse gears. Cap., \$75,000. Est. Oct., 1906. H. E. Putnam, Pres.; F. G. Gies, Vice-Pres.; C. J. Gies, Sec.; H. D. Norton, Treas. and Gen. Mgr.

Giesey, E. M.—Wheeling, W. Va. (Jewel.)

Giffard, Victor.—54 due de Bondy, Paris, France. Mfrs. storage batteries, high-tension magnetos.

Giffin, H. M.—Car Dept., Pattinson Mfg. Co., rear 48 Stanhope, Boston, Mass.

Gifford & Son, John A.—25 Park Pl., New York City. Mfrs. lamp covers, machine work to order.

Gifford-Petit Mfg. Co.—1217 Devon Ave., Chicago, Ill. Automobile Mfrs., gas, commercial.

Giffords, W. F.—Sec. and Treas. National Cement & Rubber Mfg. Co., 3053-5-7-9 Monroe St., Toledo, O.

Gifford, T. J.—14 Market St., New Bedford, Mass. (Mora.)

Gifford-Wood Co.—Greene and Columbia Sts., Hudson, N. Y. Garage.

Gilbert.—The C. G. S. unit of magnetomotive force. A gilbert equals 0.8 of an ampere-turn, q. v.

Gilbert & Barker Mfg. Co.—80-82 4th

Ave., New York City. Mfrs. storage tanks, gasoline gauges, funnels.

Gilbert, Chas.—174 Calhoun St., Battle Creek, Mich. (Ford.)

Gilbert, E. G.—Treas and Mgr. Michigan Bolt & Nut Works, foot Mildrum Ave., Detroit, Mich.

Gilbert, F. C.—Sales Mgr. Pope Motor Car Co., Toledo, O.

Gilbert, Fred E.—37 Forsyth St., Jacksonville, Fla. (Stoddard-Dayton, Maxwell.)

Gilbert, John B.—Berlin, N. H. Garage.

Gilbert, Joe M.—General Manager Continental Ca-



outchouc Co. B. Cleveland, Ohio. April 30, 1874. Ed. public school. Member N. Y. A. C. Res., Chester Hill, Mt. Vernon, N. Y. Office, 43 Warren St., New York. In the trade since 1901. Used first car 1905. Recreations, fishing, hunting.

yachting, motoring.

Gilbert Mfg. Co.—New Haven, Conn. Mfrs. automobile fabric supplies, metal specialties. Mem. M. & A. M. Cap., \$12,000. Est. 1898. F. E. Bowers, Pres.; J. H. Martin, Vice-Pres.; T. G. Bowers, Sec. and Treas.; B. R. Comstock, Supt.; Ed. Furnish, Asst. Supt.

Gilchrist, E. B.—Sec. Duplex Roller Bushing Co., Belfast, Me.

Gill—The same as "fin." See Flange and Fin and Radiator.

Gill & Sons Forge & Machine Works, P. H.—1 Lorne St., Brooklyn, N. Y. Mfrs. axles, connecting rods, gear blanks, crank shafts.

Gill Electric Co.—Tyrone, Pa. (Reo.)

Gillain, Chas. H.—Sec. and Treas. Sheldon Axle Co., Wilkesbarre, Pa.

Gilles, W. A.—Pres. and Gen. Mgr. The Autocar Co., Ardmore, Pa.

Gillespie & Co., L. W.—Marion, Ind. Repairing

Gillespie & Sons, Chas. H.—125 Dey St., Jersey City, N. J. Mfrs. varnishes.

Gillespie, J.—Sec. and Treas. Plimley Automobile Co., Victoria, B. C.

Gillet, F. B.—Jonesville, Vt. (Cadillac)

Gillet-Forest, Société de Constructions et Exploitations des Automobiles.—23 quai President Carnot, Saint Cloud, Paris, France. Mfrs. gasoline and gasoline commercial automobiles. (Gillet Forest cars and trucks.)

Gillet et Cie., Réne.—10 villa Collet, rue Didot, Paris, France. Mfrs. motorcycle motors and motorcycles.

Gilley, H. E.—1158 S. Main St., Los Angeles, Cal. (Auburn, Sunset.)

Gillies, J. W.—Haverstraw, N. Y. (Franklin)

Gillies, Jones, Miller.—Santa Monica, Cal. Garage.

Gillotte, G.—88 rue de Villiers, Levallois, Seine, France. Mfr. tops.

Gilman Distributing Agency, M. A.—Westfield, Mass. (Haynes.)

Gilmore, B. G.—Pur. Agent Royal Motor Car Co., Gordon Park Blvd. and Lake Shore tracks, Cleveland, O.

Gilmore Electric Co.—625 1st St., Boston, Mass. Mfrs. electric motors.

Gilmore, W.—262 N. Broad St., Philadelphia, Pa. (Deere.)

Gilmour Mfg. Co., R. M.—105 John St., New York City. Mfrs. asbestos.

Gilson Auto Co., L. C.—881 Congress St., Portland, Me. (Ford, Premier, Reo, Stanley.)

Gilson, James Wilder.—Sales mgr., asst. sec. and treas. Mitchell Motor Car Co. B. St. Albans, Vt., July 7, 1871. Ed. high school. Director Mitchell Motor Car Co. Member Hartford, Hartford Yacht, Racine Gold, Cleveland A. C. Res., 1336 Main St., Racine, Wis. Office, Mitchell Motor Car Co., Racine, Wis. In the trade since May 11, 1896.

Gimbal-joint.—See Joint, Gimbal.

Gimbals.—Two rings for suspending a boat's compass, so as to keep it always horizontal.

Gimlet.—A fluted boring-tool terminating in a sharp screw beginning as a point and extending to the full diameter of the tool.

Ginter, J. M.—18 Walnut St., Wooster, O. (Reo)

Girard Cycle Co.—Lincoln, Neb. (Indian, Queen.)

Girard Motor Car Co.—236 N. Broad St., Philadelphia, Pa. (Cleveland.)

Girardot, Leonce.—15 Avenue Jeanne d'Arc, Chesney (Seine-et-Oise), France. Born in Paris, April 30, 1864. One of the oldest of the first promoters of the automobile industry. He has taken part in all the great automobile races and has gained numerous victories.

Girder.—One of the two longitudinal members of a motor-vehicle-frame. See Side-member, Sill, Reach and Rail.

Girard, M.—Rouillac, Charente, France. Mfr. jacks.

Gisholt Machine Co.—1300 Washington Ave., Madison, Wis. Mfrs. turret lathes, chucking machines, boring mills, tool grinders, reamers. Cap., \$1,250,000. Est. about 20 years.

Githens Bros. Co., The.—1328 Michigan Ave., Chicago, Ill. (Oldsmobile, Stearns). Est. Jan. 1, 1902. Cap., \$30,000. W. L. Githens, Pres. and Treas.; H. A. Githens, Vice-Pres. Repairing.

Githens, H. A.—Vice-Pres. Githens Bros. Co., 1328 Michigan Ave., Chicago, Ill.

Githens, Walter L.—Automobile dealer. B. Mendota, Ill., Feb. 3, 1863. Ed high school. Director Githens Bros. Co. Member Chicago A. C., Kenwood, Chicago Motor. Res., 177 E. 50th St., Chicago. Office, 1328 Michigan Ave., Chicago, Ill. In the trade since 1899. Used first car 1899. Recreation, automobiling.

Give.—Said of a joint or structure when it yields or breaks under a load.

Gladding, Leon A.—123 Main St., New Britain, Conn. (Pope-Hartford.)

Gladding, N. A.—Vice-Pres. American Motor Car Co., Indianapolis, Ind.

Gladding, Wm. B.—Vice-Pres. United Wire & Supply Co., 109-119 Summer St., Providence, R. I.

Gladiator, Société Française des Cycles et Automobiles.—Pré St. Gervais, Paris, France. Mfrs. gasoline automobiles. (Gladiator cars.)

Gladke, Morris.—101 E. Water St., Elmira, N. Y. (Thomas Flyer.)

Glaenger & Co.—26-28 Washington Pl., New York City. Mfrs. magnetos.

Glaenger et C^e.—35 bd. Strasbourg, Paris, France. Mfrs. differential gears.

Gland.—A tubular casting which fits into the cylinder stuffing-box, through which the piston slides.

Gland-bolt.—See Bolt. Gland.

Glasby, Wm. I.—Supt. Imperial Motor Car Co., 3d and Locust Sts., Williamsport, Pa.

Glasgow Motor Tire Co.—71 Waterloo St., Glasgow, Scotland. Mfrs. non-skids.

Glasner, Martin.—Ratibor. Ober-Schlesien, Germany. Mfrs. wood wheels, wood rims.

Glass-paper.—Sheets of strong paper covered with finely powdered glass caused to adhere by glue. It is used for the same purposes as sand-paper.

Glass, Water.—A strong glass tube placed vertically on a steam boiler, with both ends communicating with the interior to show the height of the water within.

Gleason, Dr. E. E.—Port Townsend, Wash. (Waltham.)

Gleason Peters Air Pump Co.—Mercer and Houston Sts., New York City. Mfrs. horns, oil guns, air pumps, tanks, storage tanks, power driven pumps.

Gleason, W. L.—Supt. Packard Motor Car Co., Detroit, Mich.

Glenn, C. L.—Spokane, Wash. (Gale.)

Glenn, Jas. H.—Caribou, Me. (Cadillac.)

Glenn, W. J.—Kenton, O. (Maxwell.)

Glenny, Walter R.—20 W. Bernard St., Westchester, Pa. (Cadillac.)

Glenny, Wm. H.—Vice-Pres. Noye Mfg. Co., 50 Lakeview Ave., Buffalo, N. Y.

Glidden, Charles Jasper.—B. Lowell, Mass., August 29, 1857. Ed. Lowell



public schools.

Member Aero Club of France, Touring Club of France, Aero Club of America, A. C. A., Massachusetts, Bay State, Providence, Worcester, Buffalo, Royal A. C. of Great Britain, Royal Geographical Society, American

Geographical, Arctic Circle Club, Algonquin (Boston). Exchange (Boston). Res. and office. Hotel Touraine, Boston, Mass. Used first car 1899. Recreation, motoring.

Glidden, F. A.—Vice-Pres. Glidden Varnish Co., Rockefeller Bldg., Cleveland, O.

Glidden, F. H.—Pres. Glidden Varnish Co., Rockefeller Bldg., Cleveland, O.

Glidden, F. K.—Sec. Glidden Varnish Co., Rockefeller Bldg., Cleveland, O.

Glidden Varnish Co.—Rockefeller Bldg., Cleveland, O. Mfrs. varnishes, japans, enamels. Cap., \$1,000,000. Est. 1875. F. H. Glidden, Pres.; F. A. Glidden, Vice-Pres.; F. K. Glidden, Sec.; W. J. Glidden, Treas.; H. G. Ashbrook, Mgr. Jap-a-Lac Dept.; Chas. Wells, Gen. Sales Mgr.; Jas. B. Ludlow, Mgr. Promotion Dept.; G. A. Kerkendale, Mgr. Architectural Dept.; C. C. Chapp, Pur. Agent.

Glidden, W. J.—Treas. Glidden Varnish Co., Rockefeller Bldg., Cleveland, O.

Glide Motor Car Co.—327 Baronne St., New Orleans, La. (Glide.)

Gliding Boat.—See Hydroplane.

Gliesman, H. A.—78 8th Ave., New York City. Agt. Curtiss motorcycles and motors.

Glisan, A. E.—Cumberland Md. (Cadillac.)

Gliemann, H. G.—Head Dry Sundries and Mechanical Dept., Syracuse Rubber Co., 212-214 S. Clinton St., Syracuse, N. Y.

Globe Automobile Exporters, The.—43 Cedar St., New York City, and 24 bis. bd. de Courcelles and 94 bd. Malesherbes, Paris France. Importers De

Dion Bouton, Spyker cars. Est. since 1900. Manuel De Caserta, sole representative for U. S.; Louis Suberbie, Mgr. of Paris office. Rental service, with chauffeurs, for the European Continent. Automobiles crated for shipment.

Globe Boat Co.—Oswego, N. Y. Mfrs. motor boats.

Globe Brass Works.—13 Macomb St., Detroit, Mich. Mfrs. bow separators, top fixtures, metal trimmings.

Globe Iron Works.—Menominee, Wis. Mfrs. motor boats.

Globe Machine & Stamping Co.—3868 Hamilton Ave., N. E., Cleveland, O. Mfrs. brakes, brake drums, hub flanges, stampings, water jackets, gaskets, pipe flanges. Mem. M. & A. M. Cap., \$25,000. Est. 1900. B. Krause, Pres.; J. W. Juengling, Vice-Pres.; A. F. Schroeder, Sec., Treas. and Gen. Mgr.; Oscar A. Loew, Supt.; Jac Schneider, head Tool Room; Hy. Goebelbecker, head Assembling Room; Wollenzier, head Press Rooms.

Globe Malleable Iron Co.—Greenway Ave., Syracuse, N. Y. Mfrs. malleable iron castings. Cap., \$100,000. Est. 1906. W. C. Lippe, Pres.; A. T. Brown, Vice-Pres.; S. J. Marshall, Treas.; J. S. Pickell, Sec.

Globe Optical Co.—403 Washington St., Boston, Mass. Mfrs., importers and exporters goggles, masks and eye shields. Cap. \$70,000. Est. 1889. A. G. Barber, Pres. and Treas.; F. A. Barber, Vice-Pres.; R. C. Thompson, Asst. Treas. and Gen. Mgr.; W. W. Slade, Sec. and Supt.

Globe-valve.—See Valve, Globe.

Glosser, S. A.—Jersey Shore, Pa. (Caddillac.)

Glover, Chas.—Pres. The Corbin Screw Corp., New Britain, Conn.

Gloyd, S. M.—Oklahoma City, Okla (Wayne.)

Glue, Marine.—A cement composed of rubber, shellac and naphtha. It is melted and applied to wood, etc., where a water-tight joint is required. It is used also as a cement for rubber.

Glycerine.—A triatomic alcohol, existing in fats, in combination with oleic and stearic acids, etc., under the form of ethers called glycerides. It is employed, in the proportion of from 1 part to 1½ part glycerine to 3 parts water, to prevent the freezing of the water in the jacket of a gasoline motor.

Gobron-Brillié, Société des Automobiles.—13 quai de Boulogne, Boulogne, France. Mfrs. gasoline automobiles. (Gobron-Brillié cars.)

Godet, Edouard.—12 Ave. d'Orleans, Paris, France. Mfr. coils.

Godley, Charles.—Factory foreman, Edmunds & Jones Mfg. Co. 315 Riopelle St., Detroit, Mich.

Godley, Harry.—3780 Highland Ave., Pittsburg, Pa. (Matheson.)

Godshalk & Co., E. H.—Camden, N. J. Mfrs. motor boats.

Godake, P. M.—Pres., Gen. Mgr. and Designer, Racine Boat Co., 16th and Racine Sts., Racine, Wis.

Goebel, F. A.—Marietta, O. Mfrs. electric switches, electric lock switches.

Goebelbecker, Henry.—Head of Assembling Room, Globe Machine & Stamping Co., 3868 Hamilton Ave., N. E., Cleveland, O.

Goering, A. P.—Prop., Mgr. and head of Sales Dept., Hamilton Garage Co., 133-5 King St., W., Hamilton, Ont., Canada.

Goerss, Herman.—162 Russel Ave., Cleveland, O. Mfrs. steering wheels.

Goetz, Theodore.—Head of Sales Dept., Witherbee Igniter Co., 541 W. 43d St., New York City.

Goggles.—A form of spectacles worn by motorists to protect the eyes from dust, wind, flies and the glare of the sun, and made of glass, mica or celluloid. Unless specially cut lenses are used for defective sight, the glasses should be flat. Every particle of draught should be excluded by setting the goggles into some cloth-like substance that fits the face like a mask.

Gold, Aluminum.—The same as aluminum bronze.

Goldberg Motor Car Devices Mfg. Co.—1253 Michigan Ave., Chicago, Ill. Mfrs. carbureters.

Golden, Percy.—Catskill, N. Y. (Maxwell.)

Goldman, Louis.—Pres. The Cincinnati Electric Tool Co., 650-652 Evans St., Cincinnati, O.

Goldsmith Bros. Smelting & Refining Works.—68-65 Washington St., Chicago, Ill. Mfrs. platinum.

Goltermann & Sons, Chas.—Forsteil, Mo. (Waltham.)

Gong Bell Mfg. Co.—East Hampton, Conn. Mfrs. bells.

Good, D. B.—Pottstown, Pa. Garage.

Goodell-Pratt Co.—Greenfield, Mass. Mfrs. tools.

Gooden, O. L.—Mgr. garage, Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y.

Goodrich Co., B. F.—Akron, O. Mfrs. collapsible buckets, rubber mats, tire valve pump connections, tire repair kits, tire plugs, tire tools, pneumatic and solid tires. Branches, 24 E. Lake St., Chicago, Ill.; 1332 Arch St., Philadelphia, Pa.; 161 Columbus Ave., Boston, Mass.; 266 Jefferson Ave., Detroit, Mich.; 2188 9th St., S. E., Cleveland, O.; 3926-8 Olive St., St. Louis, Mo.; 1536 Glenarm St., Denver, Colo.; 4th and Washington Sts., Oakland, Cal.; 818 S. Broadway, Los Angeles, Cal.; 310 1st Ave. S., Seattle.

Wash.; 7 Snow Hill, E. C. London, Eng.
Goodson Electric Ignition Co.—Providence, R. I. Mfrs. magnetos and ignition dynamos.

Goodwell, Fletcher.—Vice-Pres. Salisbury Wheel & Mfg. Co., Jamestown, N. Y.

Goodwin & Kintz Co.—20 Rawley St., Winsted, Conn. Mfrs. copper and asbestos gaskets. Cap., \$50,000. Est. 1897. J. G. Woodruff, Pres.; C. Kintz, Sec.; Winslow Goodwin, Treas.

Goodwin, Capt. Frank.—Chief Marine Dept. of A. A. King, Lake Hopatcong, N. J.

Goodwin Motor Car Co.—6th and Mulberry Sts., Des Moines, Ia. (Mason, Rambler)

Goodwin Tate Auto Co.—18 Sabine St., Providence, R. I. Garage.

Goodwin, Thos. C.—Mgr. Baltimore Motor Carriage Co., 305 N. Howard St., Baltimore, Md.

Goodyear, Frank C.—Mgr. Bristol Automobile Co., Naugatuck Rd., Waterbury, Conn.

Goodyear Tire & Rubber Co.—Akron, O. Mfrs. automobile tires, universal rims, motorcycle tires. Cap., \$1,000,000. Est. 1898. Frank A. Sieberling, Pres. and Gen. Mgr.; G. M. Stadlerman, Sec. and Sales Mgr.; P. W. Litchfield, Supt.; C. W. Seiberling, Treas. Branches, Baltimore, 400 S. Fremont Ave.; Boston, cor. Dartmouth and Boylston Sts.; Buffalo, 719 Main St.; Chicago, 80-82 Michigan Ave.; Cincinnati, 317 E. 5th St.; Cleveland, 326 Frankfort Ave., N. W.; Detroit, 251 Jefferson Ave.; Denver, 220 16th St.; Los Angeles, 932 S. Main St.; New York, 64th St. and Broadway; Philadelphia, 1404 Ridge Ave.; San Francisco: St. Louis, 712-14 Morgan St. (Rapid)

Goodyear, Watson E.—Treas. Bristol Automobile Co., Naugatuck Rd., Waterbury, Conn.

Googins, Frank & Henderson.—Walla Walla, Wash. (Archer, Ford)

Goold & Johnson.—Montford, Wis. (Cadillac.)

Goold Co., James.—Albany, N. Y. Mfrs. wood and metallic bodies.

Gordan, C. C.—866 Clay St., Dubuque, Ia. Garage.

Gordon Battery Co.—223-231 E. 144th St., New York City. Mfrs. primary batteries.

Gordon Jewelry Co.—Shreveport, La. Garage.

Gordon, John, Jr.—Gen. Mgr. The Sireno Co., 41 Cortland St., New York City

Gordon, John, Sr.—Prop. The Sireno Co. and Vice-Pres. the State Trust Co., 4th and Olive Sts., St. Louis, Mo.

Gordon, J. W.—Barre, Vt. (Haynes.)

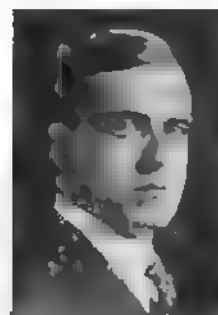
Gorham & Newport.—Waupeonsee, Ill. (Cartercar)

Gorman, E. T.—Supt. Wilmarth & Morman Co., 585 Canal St., Grand Rapids, Mich.

Gorham, John S.—Electric Vehicle expert for William G. Isbell & Co., 1413 Michigan Ave., Chicago, Ill.

Gorham, R. W.—Mount Kisco, N. Y. (Northern.)

Gorham, Sidney Smith.—Lawyer. B. Rutland Co., Vt. Nov. 6, 1874. Ed. district and graded schools of Rutland Co.



and city of Rutland. Chicago College of Law (Law Dept. Lake Forest University). Mem. Chicago A. C., Chicago Athletic, La Grange Country, Hinsdale Golf, Illinois Country. Res. 313 Madison Ave., La Grange, Ill. Office, 171 La Salle St., Chicago, Ill. Used first car 1903.

Sec. Chicago A. C. four terms, Pres. Ill. State Auto Assn. two terms. Sec. A. A. A. one term. mem. executive committee A. A. A. one term, director A. A. A. one term.

Gormalley, A. R.—Purch. Agent, Maxwell-Briscoe Motor Co., Tarrytown, N. Y.

Gorman, Frank.—Co-partner The Gorman Supply Co., 134 East 25th St., New York City.

Gorman, J. H.—Co-partner The Gorman Supply Co., 134 E. 25th St., New York City.

Gorman, J. H.—Pottsville, Pa. (Maxwell.)

Gorman Supply Co., The.—134 E. 25th St., Rooms 29 and 30, New York City. Est. March 1, 1906. Supply house. handling automobile accessories, mechanical tools and books. Partnership. J. H. Gorman and Frank Gorman.

Gorsen's Auto Exchange.—617-19 Arch St., Philadelphia, Pa. Repairing. (Second hand cars)

Gorton Rubber Co., Ltd.—Cornwall St., Openshaw, Manchester, England. Mfrs. pneumatic tires.

Goshen Auto & Supply Co.—Goshen, Ind. (Lambert, Maxwell, Cadillac.)

Goshen Motor Works.—Lincoln Ave. and 9th St., Goshen, Ind. Mfrs. marine and stationary gasoline engines; automobiles under contract. Est. since 1902.

Goshen Rubber Works.—Goshen, Ind. Mfrs. rubber mats, pneumatic tires.

Gosseline, Frank J.—Nahant, Mass. Garage.

Gottschalk, C. F.—Copenhagen, Denmark. (Monarch.)

Gottschalg und Co.—Reinickendorferstrasse 66, Berlin, Germany. Mfrs. transmission gears.

Goudard et Menesson.—119 rue de Montreuil, Paris, France. Mfrs. radiators.

Gould & Eberhardt.—99 N. J. R. R. Ave., Newark, N. J. Mfrs. special automobile machinery.

Gould & Sons, A. R.—415 Linden St., Scranton, Pa. (Thomas Flyer, Jewel.)

Gould Derby Mfg. Co.—109 N. Broad St., Trenton, N. J. Mfrs. carburetters, shock absorbers.

Gould Motor Car Co.—53 S. Royal St., Mobile, Ala. (Cadillac.)

Gould Packing Co.—88 E. Cambridge St., Cambridge, Mass. Mfrs. packing.

Gould Storage Battery Co.—25 W. 33d St., New York City. Mfrs. primary and storage batteries.

Goulding, J. H.—Pur. Agt. The Automobile Co., Ardmore, Pa.

Gourley, R. J.—409 E. Washington St., Springfield, Ill. Est. 1904. (Monarch); supplies; repairing.

Gouvy et Cie.—Oberhombourg, Lorraine, Germany. Mfrs. springs.

Governing.—The governing of a motor is an operation that consists in constantly proportioning its power to the external resistance with a view to maintaining its speed at the rate that has been assigned to it. The control of the speed of a motor is effected by an automatic governor, by hand, or by both processes at once. A number of methods (some of them fantastic) have been employed for regulating the speed of motors, but, at present, such processes are reduced to a single one, viz., that of varying the admission. Such variation, however, is either direct or indirect, and, in the latter case, is done through the intermedium of the exhaust. Besides, in gas-motors, it may comprise an arrangement that assures a uniformity of the compression, and that improves the efficiency of light loads. However this may be, the result is always the same and is exhibited by a variation in the motive fuel introduced by the piston-stroke.

Governing of internal combustion motors.—(a) By direct variation of the admission. This is effected by throttling the intake-pipe or by modifying the lift of the valves. In the first case, the governor actuates a valve, which is generally placed in the carburetter. In the second, the lift or the duration of opening of the valves, or both at once, are modified, a method which is particularly convenient with mechanically operated valves. In what precedes only the progressive variations of the admission have been considered. The direct variation by "hit-or-miss" is now no longer employed in automobilism. (b) By direct variation of

the exhaust.—This is effected by modifying the lift or the duration of opening of the valves, or by modifying the two at once, so that at the end of the exhaust there remains in the cylinder a variable quantity of burned gases that diminish by so much the quantity of fresh gas admitted.

Upon the whole, the process now most widely employed is that of direct governing on the admission, generally by throttling the intake, and more rarely by lift of the valves. See Hit-or-Miss.

Governor.—An apparatus designed to maintain the mean angular velocity of a motor within the narrowest possible limits. The fly-wheel assures the cyclic regularity of a motor, while preventing to a certain extent, through its inertia, the abrupt variations in mean velocity resulting from abrupt variations in external resistance. But it in nowise prevents a variation (which may be very great) of such mean speed when the equilibrium of the power and resistance is destroyed. It simply diminishes the rapidity of it through its inertia, which, by the way, is very useful and peculiarly facilitates the duty of the governor.

Governors are usually based upon the variations in centrifugal force of a weight of which the revolution is connected with that of the motor. Instead of balancing the centrifugal force of a heavy sleeve, as did Watt, the inventor of the first centrifugal governor, the tendency now is to employ springs, the advantages of which are lightness and ease

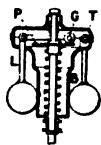


Fig. 1.

of regulation at a given speed. Fig. 1 represents, diagrammatically, a Kienast spring governor. It consists of a box, B, movable around a shaft which does not actuate it, as in most governors, through the intermedium of a key, but solely through the friction of a spring which bears, on the one hand, against a disk, P, fixed on the shaft, and on the other, against the bottom of the spring-box, B.

This arrangement eliminates the friction due to the key, which prevents the oscillations of the sleeve and slides in two grooves placed, one of them below in the sleeve, and the other above in the cover, thus constituting a perfect guide for the movable part. Two bent levers, L, oscillate around axes, T, fixed in lugs cast in a piece with the spring-box, B. One of the ends of these levers bears against the disk, P, through rollers, G. When the balls fly apart under the action of centrifugal force, the arms, L, bearing against the fixed disk, P, through the rollers, G, raise the box, B, and compress the spring. This governor, which

is of slight weight and extremely sensitive, exerts upon the distributing mechanism a prompt and energetic action.

The governors employed on automobiles are of a very rudimentary construction, and are not intended to be isochronous. They serve rather for preventing the racing of the motor, and with a given tension of the spring, regulate the velocity only within somewhat wide limits. In Fig. 2 is shown an example of one of them. A disk, A, keyed to the end of the cam shaft, B, carries two lugs, C, upon which are pivoted bent levers terminating at one extremity in the balls, D, and at the other extremity in the forks, F, which slide in the grooved collar, E, which actuates the control-rod

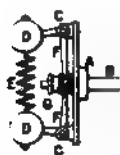


Fig. 2.

through the intermedium of an amplifying lever. A spring, L, balances the centrifugal force. The tension is calculated for the slowest velocity of the motor. Another spring, acting in the same direction, is attached to the control-rod by one extremity and by the other to a steering wheel lever and a pedal acting independently to overcome or increase its tension.

When the tension is overcome, the motor revolves at the reduced velocity allowed by the governor. When it is increased the motor revolves with so much the greater velocity in proportion as the tension is greater.

Governor, Hit-or-Miss.—A device for governing the power of gas-motors by cutting out a part of the fuel charge and causing the motor to miss some of the explosions. The "hit-or-miss governor" controls the admission of the charge either by arresting the exhaust-valve and holding it open or by acting upon a special fuel-valve that opens only when a power-stroke is necessary. See Hit-or-Miss and Governing.

Governor, Pneumatic.—A governor consisting of an air-pump, a cylinder containing a piston operating against a spring, and a throttle-valve connected to the piston. The governor can be controlled by a valve. When the speed of the motor increases, air is pumped into the governor cylinder faster than it can escape from the orifice, raising the pressure in the cylinder and moving the piston, thus closing the throttle.

Governor, Pump.—A form of governor depending upon the pressure of a liquid, either water or oil, against a flexible diaphragm or a piston. As the pump in this form of governor is driven in direct relation to the motor-speed, the amount of liquid forced against the diaphragm varies with the motor-speed, and, through

suitable levers, the movement of the governor-piston or diaphragm regulates the amount of gas admitted to the cylinders.

Governor, Ring.—An automatic governor used on the Cadillac car, and built up around a central vertical or inclined shaft, A (see figure), driven by gears



from a cam-shaft and running upon ball bearings. Pivoted on a pin passing through this shaft, and held in a tilted position by a spiral spring, C, is a ring, B, enclosed in a globe shaped casting. As the revolutions of the shaft, A, and ring, B, increase centrifugal force tends to make the ring assume a horizontal position, and, as it does so, it pushes upward on the link, D, and raises the collar, E. A shifting fork on this collar, as it is raised and lowered, rotates a shaft, K, and consequently moves back and forth the lever, F, which is connected by rod, G, to the throttle. In this manner the throttle-valve is closed. By varying the tension on the spring, C, the governor can be set so that it will not close the throttle beyond a desired point.

Goyon, H.—65 Ave. de la Bourdonnais, Paris, France. Mfrs. motorcycles.

Grabowsky, Max.—Vice-Pres. and Designer Rapid Motor Vehicle Co., Rapid St., Pontiac, Mich.

Grabowsky, Morris.—Sec. and Purch Agent, Rapid Motor Vehicle Co., Rapid St., Pontiac, Mich.

Grace, J. P.—Sec. Kokomo Electric Co., 339 Smith St., Kokomo, Ind.

Grade.—A French angle measurement—one of the divisions of a circle divided into 400 equal parts, instead of 360. A "grade" indicates also the hundredth part of a metrical scale divided into a hundred equal parts.

Grade, Indicator.—See Gradometer.

Gradient.—The degree of inclination of a road as compared with the horizontal. Gradients are usually expressed in percentages. Thus:

Per Cent.	Units.	Rise or Fall in One Mile.
		Feet.
20	1 in 5	1,056
17	1 " 6	880
14	1 " 7	754
12.5	1 " 8	635
11	1 " 9	586
10	1 " 10	528
9	1 " 11	480
8	1 " 12	440
7.75	1 " 13	406
7	1 " 14	337

6.5	1	"	15	352
6.25	1	"	16	330
6	1	"	17	310
5.5	1	"	18	293
5	1	"	19	277
5	1	"	20	204
4	1	"	25	218
3.3	1	"	30	155
2.8	1	"	35	151
2.5	1	"	40	132

Gradometer.—An instrument for showing the degree of a grade. It consists of a



curved glass tube filled with spirits, leaving a small bubble as in a spirit level tube. The tube is secured in a neat nickel-plated casing having graduations from 0 to 30 each way from the center. It is easily attached to the seat or other convenient place and the grade up to 30 per cent. can be read at a glance.

Grade Motorwerke.—Magdeburg, Germany. Mfrs. automobile motors.

Graeber, Carl.—Vice-Pres. Lawrence Motor Car Co., 13-17 W. Warren St., Lawrence, Kan.

Graef und Stift.—70 Weinberggasse, Vienna, Austria. Mfrs. gasoline automobiles. (Graef-Stift cars.)

Graham & Co., James.—293 Wooster St., New Haven, Conn. Mfrs. castings, composition brass, copper and aluminum, babbitt metals. Est. 1861.

Graham & Co., John H.—113 Chambers St., New York City. Selling agents Ham lamps. Branches, 123 California St., San Francisco, Cal.; 118-22 Holborn, London, E. C., England.

Graham & Goodman.—51-55 W. 93d St., New York City. Mfrs. shock absorbers. Garage.

Graham & Smith.—Flint, Mich. Garage.

Graham Automobile Co.—601-605 W. Madison St., Chicago, Ill. Garage.

Graham, C. E.—Vice-Pres., The Safety Insulated Wire & Cable Co., 114 Liberty St., New York City.

Graham, J. S.—Pres. Rochester Gas Engine Co., Rochester, N. Y.

Graham Mfg. Co.—Providence, R. I. Mfrs. vises.

Graham, R. E.—Vice-Pres., Sales and Advt. Mgr. Acme Motor Car Co., 8th and Elm Sts., Reading, Pa.

Graham, W. J.—Sec. and Treas. Rochester Gas Engine Co., Rochester, N. Y.

Gram, Wm. Jr.—Treas. Buffalo Dental Mfg. Co., 587-89 Main St., Buffalo, N. Y.

Gramatan Garage.—Bronxville, N. Y. Garage.

Gramlich Chemical Co.—167 Leveret St., Detroit, Mich. Mfrs. metal polishes.

Gramm, B. A.—Vice-Pres., Designer, Purch. Agent and Gen. Mgr. Logan Construction Co., 2d and Carrol Sts., Chilli-cothe. O.

Gramme.—The unit of measure of weight in the metric system. It is the mass of a cubic centimetre of pure water, weighed in a vacuum at a temperature of 4° C. (temperature of the density of water). Practically, the gramme is the 1000th part of the mass of a bar of platinum-iridium kept at the Paris Bureau of Weights and Measures, and known as the "International Kilogramme." A gramme equals 981 dynes; and 15.43 grains Troy.

Gramme-degree.—The unit of mass and temperature in relation to the specific heat or calorific capacity of different bodies. The quantity of heat that must be given to a gramme of a body to raise its temperature 1 degree or its calorific capacity by gramme-degree is called a "calorie," while the "great calorie" corresponds to a kilogramme-degree.

Gramme, Société.—20 rue d'Hautpoul, Paris, France. Mfrs. storage batteries.

Grammont, A.—Pont-de-Chéruy, Isère, France. Mfr. solid tires.

Granagan, P. J.—Jackson St., Sandusky, O. (Ford.) Est. 1899. Garage, 15 cars. Repairing.

Grand Auto Station.—204 E. 35th St., Chicago, Ill. Garage.

Grand Rapids Automobile Club.—Dr. D. Emmet Welch, Sec., Wonderly Bldg., Grand Rapids, Mich.

Grand Rapids Gas Engine & Yacht Co.—Grand Rapids, Mich. Mfrs. gasoline marine motors, kerosene motors.

Granger's Drop Forge Works.—Chicago, Ill. Mfrs. drop forgings, gear blanks, wrenches.

Granite State Automobile Club.—Albert L. Clough, Sec., Manchester, N. H.

Grant & Bros. Auto Co.—744 Woodward Ave., Detroit, Mich. (Buick, Thomas Flyer.)

Grant-Ferris Co.—Troy, N. Y. Mfrs. gasoline automobile motors.

Grant Gear Works.—6 Portland St., Boston, Mass. Mfrs. sprockets.

Grant Lees Machine Co., The.—Quincy Ave. and E. 69th St., Cleveland, O. Mfrs. special automobile machinery.

Grant Mfg. & Machine Co., The.—70 Silliman Ave., Bridgeport, Conn. Mfrs. spark plugs, carburettors, gasoline engines. Cap. \$50,000. Est. 1900. Inc. 1904. J. G. Kingsbury, Pres. and Treas.; Fayette C. Clark, Vice-Pres.; George B. Thorpe, Sec.; Jos. J. Wetzel, Sales Agt.

Grant, N. L.—206 Melrose St., Auburn-dale, Mass. Garage.

Grant Square Automobile Co.—1380 Bedford Ave., Brooklyn, N. Y. Garage.

Grant, W. C.—Winchester, Ind. (Holzman.)

Graphic Cycle & Auto Works.—Westhampton Beach, N. Y. (Cadillac, Oldsmobile, Reo.)

Graphite.—A mineral substance of a lead or iron-gray color, a metallic luster, and soft to the touch. It consists of carbon with a very minute proportion of iron. Graphite, called also "plumbago" and "black lead," occurs in gneiss, mica-slate, clay slates and limestone. The finest graphite and the most valuable for making lead-pencils is found at Borrodale, Cumberland (England). The mineral is found also in India, Ceylon, Bohemia, etc. Mixed with grease, it is used as a lubricant for gearing and drive-chains, and, in a dry state, for giving a gloss to the surface of cast iron, etc. See Carbon.

Graphite, Artificial.—See Carbon, Gas.

Grappel & Schneider.—Jerseyville, Ill. (Lambert.)

Gras, Alex.—13 bvd. de Versailles, Suresnes, France. Mfrs. elastic wheels.

Graschoff, Albert W.—West Hoboken, N. J. (Pierce, Rambler.)

Grate-generator.—A type of acetylene gas generator in which the carbide is contained in a grate-like cage which is dipped into a reservoir of water.

Gratz, H. T.—Mgr., Sec. and Treas. Kirchorfer Auto Co., 1700-2 Baxter Ave., Louisville, Ky.

Gratze Patents & Engineering Syndicate, Ltd.—44 Whitfield St., London W., England. Mfrs. speed indicators.

Graves & Congdon Co.—Oak St., Amesbury, Mass. Mfrs. automobile bodies, tops, revolving chair seats. Cap., \$10,000. Est. 1906. James R. Graves, Pres. and head of Body Bldg. Dept.; Arthur G. Congdon, Vice-Pres. and head of Trimming Dept.; Hulbert R. Jennings, Sec. and Treas.; Wm. F. Hatch, head of Paint Shop; Judson Benson, head of Blacksmithing Dept.

Graves & Conroy.—Northampton, Mass. (Reo.)

Graves, Bert.—Supt. The White Co., Rose Bldg., Cleveland, O.

Graves, George H.—Treas. Walworth Mfg. Co., 128-136 Federal St., Boston, Mass.

Graves, J. H.—836 W. Division St., Chicago, Ill. Garage.

Graves, J. R.—Pres. and head of Body Building Dept., Graves & Congdon Co., Oak St., Amesbury, Mass.

Graves, T. A.—Caven St., Ligonier, Ind. Garage.

Gravitation: Gravity.—The force with which one mass attracts another; particularly, the force of attraction exerted by the earth on a body. The actual attraction between two bodies on the earth's surface is very minute and can be detected only by special apparatus of great delicacy.

Gravity, Center of.—That point of a body in which its weight acts vertically downward, and which must therefore be supported and fixed in order that in every position the body may remain at rest. Every vertical straight line in which such point lies is called the "line of gravity;" and every plane passing through the center of gravity, the "plane of gravity." The center of gravity is determined by the intersection of two lines of gravity, or that of a line of gravity and a plane of gravity, or by the intersection of the planes of gravity.

Gray & Co., Wm. S.—76 William St., New York City. Mfrs. denatured alcohol.

Gray & Davis.—Amesbury, Mass. Mfrs. gas, electric and oil lamps, acetylene gas generators. Mem. M. & A. M. Est. 1897. Partnership Wm. Gray and Lambert Hollander.

Gray & Prior Machine Co.—Hartford, Conn. Mfrs. gasoline marine motors, universal joints.

Gray & Sons, Peter.—90 Union St., Boston, Mass. Mfrs. tool boxes, dashes and fenders, gasoline funnels, acetylene generators, lamps, tanks.

Gray Auto Co.—1548 Broadway, Denver, Colo. (Stanley.)

Gray, B. D.—Chief Engineer and Pur-Agent American Locomotive Automobile Co., Providence, R. I.

Gray, Chauncey W.—5 Taggart Block, Watertown, N. Y. (Franklin.)

Gray, Emmet P.—Pres. Gray-Hawley Mfg. Co., 605-609 W. Fort St., Detroit, Mich.

Gray, George.—Pres. Mianus Motor Works, Cos Cob, Conn.

Gray-Hawley Mfg. Co.—605-609 W. Fort St., Detroit, Mich. Mfrs. automobile and marine mufflers, exhaust horns, muffler cut-outs, foot pedals, valves, whistles. Mem. M. & A. M. Est. 1902. Emmet P. Gray, Pres.; O. P. Hawley, Vice-Pres.; Geo. E. Hawley, Sec. and Treas.

Gray, Herbert.—Pres. Kilgore Mfg. Co., 101 Main St., Old Town, Me.

Gray, J. H.—Director Dragon Motor Co., 31st, 32d and Chestnut Sts., Philadelphia, Pa.

Gray Motor Co.—Lieb and Larned Sts., Detroit, Mich. Mfrs. gasoline marine motors.

Gray, R. T.—Sec. G. B. Essex Brass Co., 480-86 Franklin St., Detroit, Mich.

Gray, W. C.—Patchogue, L. I., N. Y. (Maxwell.)

Gray, Wm.—Partner in firm of Gray & Davis, Amesbury, Mass.

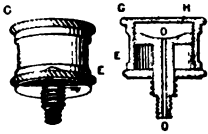
Graybill, Jno. E.—Pres. and Mgr. York Electric & Machine Co., 30-34 N. Penn St., York, Pa.

Grayhill, S. G.—Elizabethtown, Pa. (Cadillac, Winton.)

Greacen & Co., Water.—12 Mechanic St., Newark, N. J. Mfrs. license numbers, name plates.

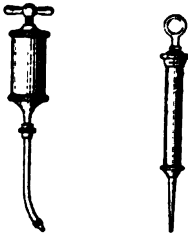
Grease-cock.—See Cock, Grease.

Grease-cup.—An arrangement for forcing grease to a bearing. It usually consists of a cup with an arrangement of springs for forcing the grease through a channel passing through the cup shank, which



holds it in place. The illustration shows the Stauffer grease-cup, which consists of a cup, G, which, after being filled full of grease is closed by screwing on the bottom, E. As the grease, H, is compressed between the top and bottom, it can escape only through the orifice, O, from which it is led to the point to be lubricated.

Grease-gun.—An instrument that should be carried by every automobile, since there are cases in which it would be impossible to inject the least quantity of lubricant in a mechanical part without it. The grease-gun must be actuated by a screw in



order to permit the driver to exert a strong pressure on the grease without much effort.

Grease-pump.—See Pump, Grease.

Greases.—Fatty materials used in lubricating and consisting of viscous hydrocarbons, analogous to vaseline, obtained at the end of the distillation of petroleum. Used in the change-speed boxes, differentials, etc., of automobiles.

Great Western Mfg. Co.—La Porte, Ind. Mfrs. motorcycles.

Green Bay Machine Co.—Green Bay, Wis. Mfrs. gasoline marine motors.

Green, C. F.—Waynoka, Okla. (Cadillac.)

Green, Harry C.—Sec. and Treas. Puritan Soap Co., 500-504 Exchange St., Rochester, N. Y.

Green, Jr., J. W.—Main St., Danbury, Conn. (Winton.)

Green & Warnick.—Stewart St., Amsterdam, N. Y. (Pope-Toledo, Stevens-Duryea.) Repairs; supplies; garage.

Greene, Dudley T.—Pres. and Gen. Mgr. Sterling Motor Car Co., 180-84 Water St., Binghamton, N. Y.

Greene, E. A.—Treas. Greene Motor Car Co., 88-90 Washington St., Newark, N. J.

Greene, G. M.—King City, Mo. Garage.

Greene Motor Car Co.—88-90 Washington St., Newark, N. J., and 654-8 Bloomfield Ave., Montclair, N. J. (Locomobile, Oldsmobile). Est. 1903. Cap., \$100,000. R. A. Greene, Pres.; E. A. Greene, Treas.; E. T. Foley, Supt.; W. L. Clerk, Vice-Pres.; W. C. Overman, Sec. Garage, 60 cars. Repairing; supplies; tire repairing and vulcanizing.

Greene, R. A.—Pres. Greene Motor Car Co., 88-90 Washington St., Newark, N. J.

Greene, Richard T.—Treas. Sidney B. Bowman Automobile Co., 225-31 W. 49th St., New York City.

Greene, Tweed & Co.—17 Murray St., New York City. Mfrs. lubricators, packing.

Greene, Will C.—91 Washington St., Watertown, N. Y. Garage.

Greenfield Automobile Co.—21 Federal St., Greenfield, Mass. (Rambler, Ford.) Garage; repairing; supplies.

Greenhut, J. B.—Pres. Siegel Cooper Co., 6th Ave., 18th-19th Sts., New York City.

Greenleaf, G. G.—Providence, R. I. (Springfield.)

Greenlease, Robt. C.—1316 E. 15th St., Ry., Detroit, Mich. Mfrs. oils.

Greensburg Automobile Co.—Greensburg, Pa. (Peerless.)

Greenslade Oil Co.—23d St. and M. C. Kansas City, Mo. (Thomas Flyer.)

Greenville Automobile Co.—Greenville, S. C. (Reo.)

Greenwalt, H. F.—823 N. Carlisle St., Philadelphia, Pa. Garage.

Greenwell-Seagraves Co.—5023 Delmar Ave., St. Louis, Mo. (Haynes.)

Greenwich Automobile Station.—Cor. Greenwich and Boston Post Rd., Greenwich, Conn. Garage; repairs.

Greenwood Auto Garage.—197 E. 47th St., Chicago, Ill. Garage.

Greenwood Bros. & Co.—Gardner, Mass. (Knox.)

Greenwood, E. E.—2d St., Laramie, Wyo. (Mitchell, Rambler.)

Greer, Erwin.—1446 Indiana Ave., Chicago, Ill. Garage.

Greer, Frederic.—Pres. Greer Motor Car Co., 66 W. Van Buren St., Chicago, Ill.

Greer, Joseph H.—Sec. and Treas. Greer Motor Car Co., 66 W. Van Buren St., Chicago, Ill.

Greer Motor Car Co.—66 W. Van Buren St., Chicago, Ill. (Pungs-Finch.) Est. 1904. Cap. \$25,000. Frederic Greer, Pres.; Joseph H. Greer, Sec. and Treas. Garage, 25 cars; repairing.

Greer-Robbins Co.—1501 S. Main St., Los Angeles, Cal. (Mitchell.) Garage.

Grégoire, Société Anonyme des Automobiles.—55 bvd. Devaux, Poissy, Seine-et-Oise, France. Mfrs. gasolene automobiles. (Grégoire cars.)

Gregory, Wm.—602 N. Main St., Los Angeles, Cal. (Moline.)

Greiner Co., Emil.—45 Cliff St., New York City. Mfrs. hydrometers.

Grendlen, C. P.—Mgr. Oil City Oil & Grease Co., Oil City, Pa.

Greuter, Charles Robert.—Mechanical Engineer Matheson Motor Car Co. B. Philadelphia, Pa., March 26, 1861. Ed. St. Gallen and Winterthur (Switzerland). Director Matheson Motor Car Co., Wilkes-Barre, Pa. Mem. Wilkes-Barre A. C. Res. 46 N. Washington St., Wilkes-Barre, Pa. Office, Matheson Motor Car Co., Wilkes-Barre, Pa. In the trade since 1897. Used first car 1896.

Grey Iron Castings Co.—Mt. Joy, Pa. Mfrs. grey iron castings.

Grid.—An accumulator plate provided with numerous pockets or perforations into which the active material is introduced in the form of a paste. See Cell, Storage.

Gridiron-valve.—See Valve, Gridiron.

Grieb, Harry.—Sec. and Treas. Ajax-Grieb Rubber Co., Trenton, N. J.

Grieb, Wm. G.—Vice-Pres. Ajax-Grieb Rubber Co., Trenton, N. J.

Grieger, L. F.—Plainview, Minn. Garage.

Greip, H. C.—Carthage, Mo. (Maxwell.)

Griffault, J.—274 route de la Révolte, Levallois-Perret, Paris, France. Mfrs. tops.

Griffin & Kilmer.—Chicago, Ill. (Smith.)

Griffin Motor Car Co.—118 W. Wayne St., Fort Wayne, Ind. (National, Maxwell, White.)

Griffin, N. D.—99 W. Fulton St., Gloversville, N. Y. (Pope-Hartford, Pope-Toledo, Pope-Waverley. Est. (in automobile business) 1904. F. W. Becker, head of Automobile Dept. Garage, 6 cars. Repairing; supplies.

Griggs Automobile & Bicycle Co.—418 Santa Fe Ave., Pueblo, Colo. Garage.

Grimes & Harris.—92 Pleasant St., Leominster, Mass. Garage.

Grimesman, F. J.—Sec. Hess Pontiac Spring & Axle Co., Pontiac, Mich.

Grinard Inserted Leather Auto Shoe Co.—Buffalo, N. Y. Mfrs. tire shoes.

Grinding in.—The operation of fitting a valve accurately to its seat by applying an abrasive, such as emery flour or finely ground glass, mixed with oil, to the face of the valve and rotating the latter until

a perfect fit is secured. The grinding is best performed by the use of a screw-driver and in turning the valve in its seat half a turn one way and then another, with a frequent lifting of the valve clear of its seat in order that no particle of the abrasive shall become imbedded in it with a consequent damage to the seat. Great care must be taken during the operation to prevent any emery from entering the cylinder.

Grinnell Garage Co.—Grinnell, Ia. (Ford, Reo.)

Grip Nut Co.—152 Lake St., Chicago, Ill.; 500 5th Ave., New York City. Mfrs. lock nuts. Cap., \$7,500. Est. 1905. E. R. Hibbard, Pres., Chicago; J. W. Hibbard, Sec., New York; R. S. Wickersbau, Gen. Mgr.; T. F. De Garno, Gen. Sales Agt.; B. F. Stewart, Mgr. Elec. Dept.

Gripe.—The lower part of the stem of a boat.

Gripping.—See Seizing.

Grisinger, A. H.—Santa Cruz, Cal. (Northern.)

Grison und Co.—Hamburg, Germany. Mfrs. clutches.

Griswold, A. H.—Holly, Colo., and Garden City, Kan. (Jackson.)

Griswold, Roger W.—Sec. and Treas. Auto Rail & Equipment Co., 113 Michigan Trust Bldg., Grand Rapids, Mich.

Griswold, T. F.—Covina, Cal. (Maxwell.)

Groff, A. C.—Main St., Sellersville, Pa. (Rambler.)

Gron Dahl, H.—Asst. Supt. Couplegear Freight Wheel Co., Ashton Bldg., Grand Rapids, Mich.

Grose, J. W.—Pur, Agt. Wayne Automobile Co., Piquette and Brush Sts., Detroit, Mich.

Grose, Ltd.—Northampton, England. Mfrs. pneumatic tires, non-skids.

Gross, Martin.—41 Luisenstrasse, Berlin, Germany. Mfrs. goggles.

Gross Terrace Garage.—Rear 1396 Madison St., Chicago, Ill. Garage; repairing; supplies.

Grosman, Ch.—11 rue Boubillot, Paris, France. Mfrs. motorcycles.

Gross, J.—89 rue de la Mare, Paris, France. Mfrs. tricar. (J. O. G. tricar.)

Grosshaus, L.—Sutton, Neb. (Waltham.)

Grossman, Emil.—Pres Motor Car Equipment Co. B. Homok, Hungary, July 1, 1871. Ed. public schools in Hungary and Cleveland, O. Pres. and Director in Motor Car Equipment Co., National Sales Corp., Royal Battery Co., International Sales Corp., Royal Battery Co., International Sales Corp. (Paris, France). Mem. Am. Motor League, A. A. A. A. C. of Buffalo, Cleveland A. C. Res.

22 Morningside Ave., New York. Office, 296 Broadway and 55 Warren St., New York. In the trade since 1897. Imported one of the first French machines. Was founder and publisher of the Cycling Gazette, Motor Vehicle Review (now the Automobile), and Good Roads Magazine. Established the Continental Caoutchouc Co. in America and was Sec. and Gen. Mgr. for 3 years.

Grossman, Geo. J.—Gen. Mgr. Mammoth Garage Co., Mamaroneck Ave. and Post Rd., White Plains, N. Y.

Grossman, Geo. J.—1649 Broadway, New York City. (Cadillac.)

Grossman, M.—Pres. Mammoth Garage Co., Mamaroneck Ave. and Post Rd., White Plains, N. Y.

Grossman, M. M.—Vice-Pres. and Sec. Mammoth Garage Co., Mamaroneck Ave. and Post Rd., White Plains, N. Y.

Grossman, W. G.—Vice-Pres. and Treas. Mammoth Garage Co., Mamaroneck Ave. and Post Rd., White Plains, N. Y.

Groth, Geo. H.—Hilliesboro, O. (Jewel, Waltham.)

Ground.—From the electrician's point of view, the earth is a conductor of which the potential is always zero. Any two points in an electrical system which are connected to the ground are therefore regarded as being connected together; hence the earth is utilized in many cases as part of an electric circuit; in telegraphy, for example, where the earth forms a return wire. In motor vehicles, the metal of the engine and chassis is taken to represent the "ground," and is utilized to return the current to its source. This method is called "grounding" (or, sometimes, "earthing") the return. A "grounded" circuit requires careful insulation of the "lead" (the wire by which the current flows from the generator to its work), since, as it is liable to come into contact with the "ground" (the engine metal) a break in the insulation would allow the current to leak and return to the generator without doing its work, a condition which is termed a "short circuit." Batteries, magnetos, timers and spark-plugs all have a pole "to ground."

Grout Bros. Automobile Co.—Orange, Mass. Mfrs. solder, aluminum solder.

Grouvelle, H. Arquembourg et Cie.—71 rue du Moulin Vert, Paris, France. Mfrs. carburettors, circulating pumps, tire pumps, radiators.

Grove, W. G.—Sec. and Treas. Unique Metal Co., 25 Illinois St., Buffalo, N. Y.

Grover & Danbar.—11 W. Canal St., Wabash, Ind. (Rambler, White, Jewel, Pope-Waverley.)

Grover, W. H.—Norfolk, Va. (Ford, Reo, Premier, Maxwell.)

Groves, H. B.—Garner, Ia., 609 Pierce St., Sioux City, Ia., and Webster City, Ia. (Northern. Thomas Flyer, Buick, Cadillac, Pope-Waverley.) Garage.

Grow Automobile Co.—Osage, Ia. (Mora.)

Grow Auto Garage & Machine Shop.—300 F St., Marysville, Cal. (Oldsmobile, Winton.) Garage; repairing.

Grub-screw.—See Screw. Grub.

Grubb, W. J.—Supt. Light Mfg. and Foundry Co., 509 Queen St., Pottstown, Pa.

Gruber, L. W.—Sec. Tindel-Morris Co., Eddystone, Pa.

Gruenewald, E.—Designer and Supt. Moline Auto Co., East Moline, Ill.

Gruenfeldt, E.—Engineer and Designer Baker Motor Vehicle Co., 80th St., N. W., Cleveland, O.

Gründler, Max.—Liebenwalderstrasse 31, Berlin, Germany. Mfrs. bodies.

Guarantee Auto Co.—162 W. 56th St., New York City. Instruction, automobile; repairing.

Gudgeon-pin.—Another name for wrist-pin or piston-pin.

Gudger & Ewing.—Stockton, Kan. Garage.

Gue, Harry D.—Vice-Pres. Dow Tire Co., 104 W. 42d St., New York City.

Guenet, J.—5 rue de Montmorency, Paris, France. Mfrs. spark plugs, coils.

Guenther, E. P.—High and Boulevard, West Hoboken, N. J. Garage.

Guerin.—24 rue de Pantin, Bagnolet, Seine, France. Mfrs. metallic rims.

Guerin, Frères.—10 rue de Laborde, Paris, France. Mfrs. automobile motors.

Guérot.—54 rue Daguerre, Paris, France. Mfrs. primary batteries.

Guerra & Co.—Merida, Yucatan. Mex. (Northern.)

Guerry et Bourguignon.—116 bvd. de Grenelle, Paris, France. Mfrs. motorcycles.

Guétat, J.—7 rue Boutard, Neuilly, France. Mfrs. radiators.

Gugin, Robt.—550 Seymour St., Vancouver, Canada. (Franklin.)

Guide-bars.—The straight bars which cause the slide-blocks of a steam-engine to move in a straight line.

Guide, Cross-head.—The slideways between which the cross-head of a reciprocating engine moves.

Guide Michelin.—155 bvd. Pereire, Paris, France. Pub. maps.

Guide-rope.—A strong rope about one hundred feet in length suspended from the hoop or ring of a balloon, and which, in a descent, acts as a substitute for ballast, since every inch resting on the ground relieves the balloon of an equivalent portion of its weight.

Guide Routier Continental.—146 Ave. Malakoff, Paris, France. Pub. maps.

Guide, Vulcan.—8 Place de la Concorde, Paris, France. Pub. maps.

Guillott Metal Gasket Co.—97 S. Clinton St., Chicago, Ill. Mfrs. gaskets.

Guillott Gasket Co., Wm.—1108 W. West Ave., Buffalo, N. Y. Mfrs. packing.

Gulf Auto & Machine Works.—101 Franklin St., Tampa, Fla. (Franklin.)

Guillemin & Cie., H.—12 rue de Metz Courbevoie, Seine, France. Mfrs. gasoline automobiles. (Guy cars.)

Guillierme, F.—17 rue de Billancourt, Paris, France. Mfrs. gasoline commercial vehicles.

Gullicksen, O. C.—Sec. and Treas. Churchill Cabinet Co., 72 Churchill St., Chicago, Ill.

Gulstine & Waskey.—Madison, S. D. (Buick.) Est. 1889. Not inc. Cap. \$75,000. H. H. Gulstine and Geo. H. Waskey, partners; repairing.

Gulstine, H. H.—Co-partner, Gulstine & Waskey, Madison, S. D.

Gumelastic Tire Co.—920-22 Boliver Rd., Cleveland, O. Mfrs. tire fluid.

Gum Lac.—See Shellac.

Gummiwerke Fulda.—Fulda, Germany. Mfrs. pneumatic rubber tires.

Gummiwerke Oberspree.—Oberschönweide, Berlin, Germany. Mfrs. pneumatic rubber tires.

Gump Automobile Co., A. W.—1118 S. Main St., Los Angeles, Cal. (Jackson, Glide.)

Gunby Co., L. W.—Salisbury, Md. (Atlas trucks.)

Gunderson, G. B.—Vice-pres. Northern Motor Car Co., Champlain and Canton Sts., Detroit, Mich.

Gunderson, Victor Martin.—Sec. and Treas. and Gen. Mgr. Northern Motor Car Co. B. Chicago, Ill., Oct. 11, 1869. Ed. high school graduate. Director Northern Motor Car Co. Mem. Detroit A. C. Res., 220 Seyburn Ave. Office, Champlain and Canton Sts., Detroit, Mich. In trade since 1901.

Gun-cotton.—See Cotton, Gun.

Gun-metal.—A kind of brass, composed of 9 parts of copper and 1 part of tin. It is employed for the manufacture of bearings and is suitable also for valves.

Gunther Bros.—1633 Madison Rd., Cincinnati, O. (Royal Tourist.)

Gunther Co., Jos. F.—1240 Michigan Ave., Chicago, Ill. (Apperson.)

Gunther, Jos. F.—Manager Rambler Garage Co. B. Chicago, Ill. Ed. Wells and St. Michael. Director Rambler Garage Co. Pres. Chicago Auto Trade Ass'n., Vice-Pres. Chicago Motor, Director Chicago A. C. Res., 1733 Waveland Ave. Office, 1462 Michigan Ave., Chicago, Ill. In the trade 7 years.

Gunther's Sons, G. C.—184 5th Ave.,

New York City. Mfrs. miscellaneous wearing apparel, furs.

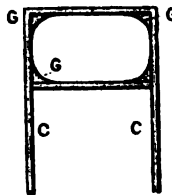
Gunthorpe, McKean Co.—Mobile, Ala. (Maxwell.)

Gunwale.—The lengthwise strip covering the upper end of the framing-timbers in a boat.

Gurner Machine Works, The.—410 W. 7th St., Hanford, Cal. (Ford, Buick, Auburn, Reo.) Est. Dec. 1, 1905. Garage, 20 cars. Repairing.

Gurnett, C. H.—Advt. Dept., The Automobile, Flatiron Bldg., New York City.

Gusset.—A re-enforcing piece, G (see figure), in the form of a triangle for strengthening the angles of an automobile frame, C C, of pressed steel. It is rivetted to the frame or pressed at the same time as the frame itself.



Gusstahlkugelfabrik Bamberg,, Heim Co.—Bamberg, Germany. Mfrs. ball bearings.

Gustin Auto Co.—1309 Sycamore St., Cincinnati, O. (Lambert.)

Gutches & Smith.—Havana, Cuba. (Knox.)

Guthrie, Geo. H.—Supt. Muncie Auto Parts Co., Elliott St. and L. E. & W. Yards, Muncie, Ind.

Guth und Wolff.—Liegnitz, Germany. Mfrs. wood wheels.

Gutta-percha.—The inspissated juice of *Isonandra gutta*, a large forest tree, reaching a height of 60 to 70 feet, with a trunk 2 to 3 feet in diameter. It is a native of the islands of Southern India, especially Borneo and Sumatra. The raw gutta-percha is exported in lumps weighing five to six pounds. It is prepared for use by cutting it up in slices, which are softened by being immersed in hot water, and are then torn into fine shreds, by rapidly revolving cylinders set with sharp teeth, and thrown into cold water, when the impurities sink, and the gutta-percha floats to the surface. The shreds are then transferred to hot water, and are made into solid masses, which are afterward kneaded by machinery, in order to expel the extraneous moisture. It is used for driving-bands for small machinery, for battery boxes, and extensively as an insulator for electric cables or wires.

Gutta Percha & Rubber Mfg. Co.—126 Duane St., New York City. Mfrs. collapsible buckets.

Guy, Mark.—Asbury Park, N. J. Repairing.

Guyénot, J.—rue du Printemps, Paris, France. Mfrs. lubricators.

Guyon, H. A.—62 Broad St., Bed Bank, N. J. Garage.

Guyot et Cie., Henri.—41 rue St. Fer-

dinand, Paris, France. Mfrs. carbureters.

Gyax, J.—Bienne, Switzerland. Mfrs. bodies.

Gydeson, C. F.—Mgr. Houston Motor Car Co., San Jacinto and Prairie St., Houston, Tex.

Gyroplane.—A flying machine on the

helicopter (see Helicopter) principle, constructed by Messrs. Breguet and Richet, and in which the lifting action is secured by the reaction upon the air obtained from four gyratory systems, each consisting of eight revolving aeroplanes. The latter are driven by a motor placed in the center of the apparatus.

H

H.—Symbol for the "magnetizing force" at a point.

H.—Abbreviation of "henry" (electricity).

h. p.—An abbreviation of "horse-power."

h.—Symbol of "height," "hour" and "hecto."

H-quadrant.—See Quadrant, Gate.

H-section.—A form of steel bars having a cross-section resembling the letter H.

H. & H. Dry Battery Co.—754 Michigan St., South Bend, Ind. Mfrs. primary batteries.

Haarlemsche Automobielen Motorrijwielabriek.—Zooete Strasse, Haarlem, Holland. Mfrs. motorcycles.

Haas & Co., Cyrus A.—Fullerton Bldg., St. Louis, Mo. Designers and contractors, special machinery, patterns, models and laboratory tests.

Haase Motor Works.—1019 Lloyd St., Milwaukee, Wis. Mfrs. gasoline marine motors.

Hachette et Cie.—79 Blvd. Saint-Germain, Paris, France. Pubs. maps.

Hackensack Auto Co.—Main St., Hackensack, N. J. (Maxwell.) Garage and repairing.

Hackett, George B.—Treas. Hackett Motor Car Co., 218 Paterson St., Paterson, N. J.

Hackett Motor Car Co.—218 Paterson St., Paterson, N. J. (Manhattan trucks.) Est. March, 1907. Cap. \$100,000. George Hardy Payne, Pres.; George B. Hackett, Treas.; L. W. Gilmore, Sec. and hd. New York office, Transportation Dept., 498 Broome St. Garage, 15 cars; repairing cars represented only.

Hack-saw.—A fine-toothed frame-saw for cutting metals.

Hadley, C. E.—Gen. Mgr. The Garford Company, Elyria, O.

Hadley, Henry.—Gardner, Mass. Garage.

Hadlock, W. Y.—15 N. Main St., Manchester, N. H. (Rambler, Queen.) Supplies; garage; repairing.

Haendler, Arthur.—Heidestrasse 52, Berlin, Germany. Mfrs. bodies.

Haelet, Jas. G.—Designer Rainier Co., Saginaw, Mich.

Hagedorn & Co., A.—12 Paul St., Finsbury, London, E. C., England. Mfrs. tire pumps.

Hagendorfer und Werdermann.—Treb-
bin, Germany. Mfrs. tire pumps.

Hagen, Gottfried.—Kalk bei Köln, Germany. Mfrs. electric automobiles (Urbanus cars); electric commercial automobiles (Hagen trucks); storage batteries.

Hager Carburetter Co.—819 Broadway, Nashville, Tenn. Mfrs. carburetters.

Hager, Wm.—1308 Cascade Ave., Colorado Springs, Colo. (Isotta Fraschini.)

Hagerstown Automobile Club.—Hagerstown, Md. Chas. M. Danzel, Sec.

Hagerstown Spoke & Bending Co.—Hagerstown, Ind. Mfrs. wood rims and wheels.

Hagmann & Hammerly.—1077 W. Harrison St., Chicago, Ill. (Jewel, Deere, Cartercar.)

Hahn & Hahn.—Bridgeton, N. J. (Ford.)

Hahn, H. J.—St. Charles, Ill. Garage.

Hahn, S. A. D.—Helena, Mont. (Cadillac.)

Haigh, Chas.—Boston, Mass. (Pennsylvania.)

Haines, Egbert.—Goshen, Ind. (White.)

Haines, F. A.—Sec. and Treas. Smith-Haines, 1673 Broadway, New York City.

Haines, W. B.—804 E. Market St., Sunbury, Pa. Garage.

Hainpold, S.—Hd. of Upholstery Dept. Fickling & Co., Inc., 154 E. 57th St., New York City.

Halderman, O. A.—Marion, Ind. Mfrs. adjustable lamp brackets.

Hale, E. T.—University Garage, New Haven, Conn. (Knox.)

Hale, Ralph.—Willet and Crouse Sts., Fort Plain, N. Y. Garage.

Hales, J. C.—Wilson, N. C. (Ford.)

Halesite.—Huntington Harbor, L. I., N. Y. Mfrs. motor boats.

Half-center.—The position of a motor-crank when at right angles to the line of the piston-rod.

Half-elliptic Spring.—See Springs.

Half-lap Joint.—See Joint, Half-lap.

Half-speed Shaft.—Same as half-time shaft, half-motion shaft and two-to-one-shaft. See Cam-shaft.

Hall & Son, E. O.—Honolulu, Hawaiian Islands. (Cadillac, Pope-Hartford, Franklin.)

Hall, A. L.—Asst. Pur. Agent Dragon Motor Co., 31st, 32nd and Chestnut Sts., Philadelphia, Pa.

Hall Bros.—1613 Euclid Ave., Cleveland, O. (Cartercar, Reliance, Rapid, Climax.) Est. Oct., 1906. Not Inc.

Hall, C. A.—Des Moines, Ia. (Maxwell.)

Hall, C. M.—Adv. Mgr. Royal Equipment Co., 165 Housatonic Ave., Bridgeport, Conn.

Hall, Charles M.—Salesman. B. Millersburg, O., Oct. 29, 1867. Mem. Chicago Athletic, Kenosha Country, Cleveland A. C., Buffalo A. C. Res., Kenosha, Wis. Office, Badger Brass Mfg. Co. In automobile trade since 1900.

Hall Co., Chas. E.—108 Broadway, Buffalo, N. Y. Mfrs. tools, stampings, wrenches.

Hall Co., Inc., E. H.—12 Elm St., Rochester, N. Y. Mfrs. carbureters, dashes and fenders.

Hall, C. R.—Collingwood, N. J. (Cadillac.)

Hall, E. G.—111 E. Broadway, Brownwood, Tex. (Cadillac.) Est. 1895. Garage, 15 cars. Repairing.

Hall, E. H.—Prairie City, Ore (Waltham.)

Hall, Henry I.—Vice-Pres. The Alden Speares Sons & Co., 369 Atlantic Ave., Boston, Mass.

Hall, H. J., Jr.—Pres. Columbia Lubricants Co. of New York, 78 Broad St., New York City.

Hall, J. K. P.—Pres. Stackpole Battery Co., St. Mary's, Pa.

Hall, John W.—10th Ave., Clinton, Ia. (Maxwell.)

Hall, Robert.—Sec. American Motor Truck Co., Caledonia St., Lockport, N. Y.

Hall, Spencer.—1401 Park St., Racine, Wis. (Holsman.)

Hallada, G.—Dortheenstrasse 22, Berlin, Germany. Mfrs. grade indicators.

Halladay, Floyd.—Hotel Downey, Lansing, Mich. (Buick.)

Hallet & Son, J. N.—Carson City, Mich. (Jackson.)

Hallet, E. M.—Pur. Agt. Stanley Motor Co., Newton, Mass.

Halliday, C. A.—42 Cedar St., Oneida, N. Y. Mfr. cloth and carpet trimmings, and Sec. Schubert Bros. Gear Co.

Halliday Co., The.—Streator, Ill. Garage.

Halliwell, Thos. D.—Vice-Pres. Tower & Lyon Co., 95 Chambers St., New York City.

Halsey & Smith, J. H.—Shipman and Springfield Aves., Newark, N. J. Mfrs. leathers.

Halsey Automobile Co.—3910 Olive St., St. Louis, Mo. (Buick, Packard, Stevens-Duryea, Franklin, Knox.)

Halsey James T.—336 W. York Ave., Philadelphia, Pa. Mfr. steam automobiles.

Halverson, H.—Whitewater, Wis. (Cadillac.)

Halz, C. H.—Gen. Mgr. Jas. L. Gibney & Bro., 211-13 N. Broad St., Philadelphia, Pa.

Ham & Ross.—23 S. College St., Charlotte, N. C. (Maxwell.) Est. 1906. Partnership J. H. Ham and J. H. Ross, under name of Ham & Ross. Garage, 12 cars; repairing.

Ham, Geo. W.—Pres. and Treas. C. T. Ham Mfg. Co., 731 Oak St., Rochester, N. Y.

Ham Mfg. Co., C. T.—731 Oak St., Rochester, N. Y. Mfrs. cold blast side and tail lamps. Mem. M. & A. M. Cap., \$100,000. Est. 1886. Geo. W. Ham, Pres. and Treas.; P. McCutchen, Asst. Treas.; Jas. Barnes, Sec.; Jno. H. Graham & Co., Selling Agents, 113 Chambers St., New York City.

Hambrick Motor Car Co.—Washington, Ind. Mfrs. gasoline commercial automobiles, gasoline automobiles.

Hamelle, H.—21 quai Valmy, Paris, France. Mfr. lubricators.

Hamerstrom, F. N.—Care Trenton Rubber Mfg. Co., Trenton, N. J. (Dragon.)

Hamill, Colonel.—San Juan, Porto Rico. (Franklin.)

Hamill, W. D.—601 W. 3d St., Williamsport, Pa. (Baker.)

Hamilton, Albert Gould.—Sec. Fiat Automobile Co. B. South Orange, N. J., Aug. 21, 1866. Ed. public school and college. Director Fiat Automobile Co. Mem. Larchmont Yacht. Res., Larchmont Manor, N. Y. Office, 1751 Broadway, New York City. In the trade since March 1, 1900. Used first car May, 1899, in Paris.

Hamilton Auto Co.—2312 Madison Ave., Baltimore, Md. (Stoddard-Dayton.)

Hamilton Auto Co.—221 Eagle St., Dunkirk, N. Y. Garage.

Hamilton Auto Co.—206 N. Broad St., Philadelphia, Pa. (Stoddard-Dayton.)

Hamilton Automobile Club.—Hamilton, Canada. S. O. Greening, Pres.

Hamilton Automobile Co.—1251 Michigan Ave., Chicago, Ill. (Panhard, Mercedes, Isotta, Chadwick.)

Hamilton, C. M.—1620-24 Broadway, New York City. (Isotta Fraschini.)

Hamilton Garage Co.—133-135 King St., W., Hamilton, Canada. (Oldsmobile, Franklin, Maxwell.) Est. 1906. A. P. Goering, Prop. and Mgr.; A. R. Goering, head Sales Dept.; Jack Wilson, head Repair Dept. Garage, 30 cars; repairing.

Hamilton, G. H.—Sales Mgr. The G. & J. Tire Co., 549-65 E. Georgia St., Indianapolis, Ind.

Hamilton, Harry.—Greenburg, Ind. (Rambler.)

Hamilton, H. G.—Treas. and Gen. Mgr. Rapid Motor Vehicle Co., Rapid St., Pontiac, Mich.

Hamilton, J. H.—Charlotte, N. C. (Pope-Hartford.)

Hamilton Motor Car Co.—26 N. 2d St., Hamilton, O. (Buick, Elmore.) Est. Jan. 1, 1907. Cap., \$10,000. Lee N. Parrish, Pres.; J. D. Andrews, Vice-Pres.; C. D. Wilson, Sec. and Treas. Garage, 25 cars; repairing.

Hamilton, P. H.—Youngstown, O. (Jewel.)

Hamilton, Walter.—Asst. Mgr. Nevada Automobile & Supply Co., 115 Ramsey St., Goldfield, Nev.

Hamlin & Emery Brass Co.—Boston, Mass. Mfrs. brass fittings.

Hamlin, R. C.—1806 S. Main St., Los Angeles, Cal. (Franklin, Lozier.)

Hammacher, Schlemmer & Co.—133 4th Ave., New York City. Mfrs. tools.

Hammann, G. E.—Sec. and Treas. Progressive Mfg. Co., 41 Norwood St., Torrington, Conn.

Hammar Mfg. Co., H.—170 E. Madison St., Chicago, Ill. Mfrs. mufflers.

Hammend, J. W.—79-81 W. Main St., Fredonia, N. Y. (Waltham.)

Hammer.—There are a large number of kinds of hammers, of different forms and weights. The most frequently employed by automobilists are the "ball pein," copper and lead hammers.



Metallic pieces provided with a thread or the parts of which are fragile are struck with lead, copper or rawhide-faced hammers or by wooden or fiber mallets which do not deform them.

An automobile should always carry a steel ball pein hammer (see figure) in the tool-box for use with chisels, punches and drifts, and a copper or lead hammer for dismounting fragile pieces or threaded parts which need blows to rejoin them. (2) A term also for the moving electrode which comes in contact with the "anvil" in a make-and-brake ignition system. (3) The piece of metal in a trembler which comes in contact with the coil-core.

Hammer-break Ignition.—See Ignition.

Hammond Wrench Co.—26-30 Atlantic Ave., Boston, Mass. Mfrs. wrenches.

Hamoir, Duchesne et Cie.—Herstal, Belgium. Mfrs. pressed steel frames.

Hampden Auto Co.—60 Main St., Springfield, Mass., and Westfield, Mass. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Hanaire, Société des Accumulateurs.—7 rue Danton, Levallois-Perret, France. Mfrs. storage batteries.

Hanauer Automobile Co.—118 E. 7th St., Cincinnati, O. (Locomobile, Winton.)

Hancock & Heller.—184-190 Water St., Binghamton, N. Y. Mfrs. tire tools.

Hancock Inspirator Co.—85 Liberty St., New York City. Mfrs. stampings.

Hancock Mfg. Co.—770 E. Henry St., Charlotte, Mich. Mfrs. lubricators.

Hancock, W. C.—Concord, Mass. Garage.

Hand-drill.—See Drill.

Hand-hole.—An aperture formed in a gear-case to permit of an inspection, cleaning and lubrication of the enclosed mechanism, and which is closed by a "hand-hole plate."

Hand-lever.—See Lever, Hand.

Hand-wheel.—See Wheel, Hand.

Handicap.—A condition imposed in order, as far as possible, to render the chances of competitors in a race equal, such as carrying of extra weight, or the requirement of a greater distance or a later start than is assigned to an inferior competitor.

Handy, Robert.—West Midland St., Bay City, Mich. Garage.

Haney Gas Engine Co.—Ligonier, Ind. Mfrs. gasoline automobile and marine motors.

Hanford Agricultural Works.—Hanford, Cal. (Oldsmobile, Winton.)

Hanger, Body.—The same as spring-hanger, q. v.

Hanger-bolts, Motor.—Bolts that screw through the car frame and into the end of the cylinder, and form the two end supports for the motor.

Hanger, Frame.—The same as Spring-hanger, q. v.

Hanger, Spring.—See Spring-hanger.

Hankey & Congdon.—414 Main St., Santa Ana, Cal. (Pope-Waverley, Tourist.)

Hankins Bros.—Elsie Mich. (National.)

Hankinson & Thompson.—Pine Bluff, Ark. (Cadillac.)

Hankins, W. B.—Advt. Mgr. Pope Motor Car Co., Toledo, O.

Hankscraft Co.—Madison, Wis. Mfrs. motor boats.

Hanley, I. E.—Huntington, W. Va. (Jewel.)

Hanna Storage Battery Co.—McCordsville, Ind. Mfrs. storage batteries.

Hannan & Henry Motor Co.—29-31 Catherine St., Ogdensburg, N. Y. (Cadillac, Buick.) Est. 1904. Garage, 30 cars. Repairing.

Hannan, Geo. E.—1441 Welton St., Denver, Colo. (Jewel, Jackson.)

Hannoversche Actiengummiwarenfabrik.—Linden, Hanover, Germany. Mfrs. pneumatic rubber tires.

Hannoversche Gummikamm Co.—Hanover, Germany. Mfrs. pneumatic rubber tires.

Hannoversche Holzbearbeitung und Wagonfabriken.—Linden, Hanover, Germany. Mfrs. wood rims.

Hannoversche Maschinenbau Actien Gesellschaft.—Linden, Hanover, Germany. Mfrs. steam commercial automobiles. (Stoltz trucks.)

Hannoyer et fils.—30 rue Fouquet, Levallois-Perret, France. Mfrs. springs.

Hanote-Dartois, Veuve.—Faubourg de Valenciennes, Douai, France. Mfrs. wood wheels.

Hans Co., Edmund E.—Minneapolis, Minn. Mfrs. gasoline indicators.

Hans, E. C.—Supt. Banker Bros. Co., Baum and Beatty Sts., Pittsburg, Pa.

Hans Motor Car Co.—424 S. 4th St., Minneapolis, Minn. (Stearns.)

Hans, Renold.—Brook St., Manchester, England. Mfr. chains.

Hansa Automobile Gesellschaft.—Varel-Oldenburg, Germany. Mfrs. gasoline automobiles.

Hansen & Co., A.—14 Hubbard St., Chicago, Ill. Repairing.

Hansen Machine Works.—Helena, Mont. (Cadillac.)

Hansen Mfg. Co., O. C.—156 E. Water St., Milwaukee, Wis. Mfrs. wearing apparel, gloves and gauntlets.

Hansom.—A type of enclosed vehicle having a single seat at the rear, access to which is obtained by a front door.

Hanson, A.—Alpena, Mich. (Maxwell.)

Hanson, Chas.—1406 Grand Ave., Kansas City, Mo. (Indian.)

Hanson, J. Howard.—Second Vice-Pres. General Vehicle Co., Broadway and 62d St., New York City.

Hanson, N. R.—Huron, S. D. (Jackson.)

Hanson, T. S.—Advt Mgr. The Electric Launch Co., Ave. A and North St., Bayonne, N. J.

Hanway, H. D.—Belair, Md. (Cadillac.)

Hapgood, O. D.—Rep. Dept. of Geo. A. Sanger, 206 W. Main St., Orange, Franklin Co., Mass.

Hara, J. S.—Merriton, Canada. (Waltham.)

Haradon, Wm. M.—Sec., Treas. and Mgr. Victor Auto Storage Co., 147-149 W. 55th St., New York City.

Harbottle Co.—Watertown, N. Y. (Waltham.)

Harburgh Tire Co.—234 W. 58th St., New York City. Mfrs. pneumatic tires.

Hard, Dr. A. D.—Marshall, Minn. (Waltham.) Est. 1903. Repairing.

Hardegan, Emil C.—Supt. Pope Motor Car Co., 139 S. East St., Indianapolis, Ind.

Hardening.—The process of heating and sudden cooling of steel which gives the maximum amount of hardness to the metal. This is afterwards modified by "tempering," q. v.

Hardening, Case.—A process consisting in adding such a percentage of carbon to a relatively thin external layer of iron or mild steel as will, on correct quenching, produce a hardened surface, while the inner core of the metal retains its initial character. It differs from cementation in that in the latter process the carbon is allowed to penetrate through or nearly through the metal, and is not interrupted so as to form merely a surface or "case" of carburized metal. Among the mechanical parts of automobiles that require to be case-hardened are wrist-pins, roller and ball-bearings, chains, bushes, parts of cam-shafts, gear-wheels of all kinds, valve-levers, etc.

Hardness.—That modification of cohesive attraction which enables bodies to resist any effort made to abrade their surfaces. Its relative intensity is measured by the power which they possess of cutting or scratching other substances.

Hardening, Oil.—The hardening of steel by heating it to redness and plunging it into oil.

Harder, J. Emmot.—Asst Business Mgr. Harder's Gun Works, 10 Market St., Clearfield, Pa.

Harder, John E.—Gen. Business Mgr. Harder's Gun Works, 10 Market St., Clearfield, Pa.

Harder's Gun Works.—10 Market St., Clearfield, Pa. (Waltham, Thomas, Buick, Franklin, Cadillac, Pope-Waverley.) Est. 1878. Not inc. John E. Harder, Gen. Business Mgr.; J. Emmet Harder, Asst. Business Mgr. Garage, 10 cars. Repairing.

Harding, Geo. S.—1401 Michigan Ave., Chicago, Ill. Garage.

Hardin, John R.—First Vice-Pres. Weston Electrical Instrument Co., Waverley Park, Newark, N. J.

Hard Rubber.—Same as Ebonite, q. v.

Hard Solder.—See Solder.

Hardware Specialty Mfg. Co.—724 W. 8th St., Anderson, Ind. Mfrs. automobile tops.

Hardy Automobile Co., C. H.—529 2d St., Alleghany, Pa. Garage.

Hardy Co., R. E.—86 Watts St., New York City. Mfrs. spark coils, spark plugs, timers.

Hardy, Francis A.—Pres. The Diamond Rubber Co., Akron, O.

Hardy, Lawrence P.—Automobile editor New York World. B. Peacham, Vt., July 14, 1883. Ed. Caledonia County, Vt., Grammar School, Nichols Latin School, Lewistown, Me.; Dartmouth College, Hanover, N. H. Ran automobile Department for Newark (N. J.) Advertiser, 1904, 1905.

Hardy, R. A.—Designer Acme Motor Car Co., 8th and Elm Sts., Reading, Pa.

Harl, John C.—Punxsutawney, Pa. (Maxwell.)

Harlem Automobile Co.—159 W. 127th St., New York City. Garage.

Harley-Davidson Motor Co.—315 39th St., Milwaukee, Wis. Mfrs. motorcycles.

Harmon, S. F.—Tacoma, Wash. Garage.

Harness, Wiedner Co.—Calumet, Mich. (Maxwell.)

Harper Buggy Co.—Columbia City, La. Mfrs. gasoline automobiles.

Harlow, Wm. O.—Kalamazoo, Mich. (Maxwell.)

Harmon, A. E.—10th and Granby Sts., Norfolk, Va. (Mitchell, Waltham.)

Harmon, H. A.—87 Cross St., Portland, Me. (American Mors, Aerocar, White.)

Harper Co., Walter J.—225-231 Mulberry St., Newark, N. J. Mfrs. bow separators, top bows, lamp brackets, lamp covers, robe rails, tire holders, top fixtures, metal trimmings.

Harper, D. Walter.—2503 N. Carlisle St., Philadelphia, Pa. Garage.

Harper Garage Co.—Salem, Mass. Cap., \$4,000. Incorporators, William A. Rowe, George A. Rowe and Fred R. Harper. Garage.

Harper's Garage Co.—Beverly, Mass. (Reo, Premier, National.)

Harphan, E. L.—Sec. and Treas. Knox Auto Co. of Ill., 1208 Michigan Ave., Chicago, Ill.

Harping or Harpin.—A ribband trimmed to the shape of, and bolted to the cant-bodies of a boat to hold them together till planked. (2) A wale of the bow of extra strength.

Harrell, Geo. H.—685 Chapel St., New Haven, Conn. Garage.

Harrington & King Perforating Co.—N. Union St., Chicago, Ill. Mfrs. perforated metals.

Harrington Garage.—Worcester, Mass. G. H. Phelps and F. L. Sanford, Props. Garage and supplies.

Harrington, D. A., Jr.—Branch Mgr. Corbin Motor Vehicle Corp. of New York, 1888 Broadway, New York City.

Harrington, John S.—36 Central St., Worcester, Mass. (Thomas Flyer.)

Harrington Lubricant Co.—1691 Broadway, New York City. Mfrs. oils.

Harris, Alexander.—Supt. Cryder & Co., 583 Park Ave., New York City.

Harris & Dunlap.—Lompoc, Cal. (Reo.)

Harris & Wilson.—326 Main St., Niagara Falls, N. Y. Garage.

Harris Bros. Co.—O'Reilly 104, Havana, Cuba. Garage.

Harris, D. P.—Vice-Pres. Reading Standard Co., Water St., Reading, Pa.

Harris, Frederick A.—Sec. Brush Runabout Co., 14-16 Baltimore Ave. W., Detroit, Mich.

Harris Oil Co., A. W.—330 Water St., Providence, R. I. Mfrs. grease, oils, semi-solid oils, metal polishes.

Harris Safety Co.—39 E. 20th St., New York City. Mfrs. fire extinguishers.

Harris Steam Engine Co., W. A.—Park and Promenade St., Providence, R. I. (Mitchell.)

Harrisburg Pipe & Pipe Bending Co.—Harrisburg, Pa. Mfrs. wrought iron and steel pipe.

Harrisburg Auto Co.—3rd & Hamilton Sts., Harrisburg, Pa. (Stanley, Reo, Rambler, Logan, National, Babcock.) Est. 1902. Cap., \$200,000. Not inc. Geo. G. McFarland, Pres. and Gen. Mgr.; W. R. Blough, Treas.; W. C. Randal, head Clerical Dept.; Paul Messner, head Repair Dept. Garage (4-story, fireproof). Repairing.

Harrison Auto Co., W. T.—1804 4th Ave., Birmingham, Ala. (Cadillac.)

Harrison Co., H. O.—1210 S. Main St., Los Angeles, Cal. (Oldsmobile, Corbin, Peerless.)

Harrison, C. L.—Third Vice-Pres. American Oak Leather Co., Kenner St. and Dalton Ave., Cincinnati, O.

Harrison Garage, The.—310 Harrison St., Syracuse, N. Y. (Dolson, Northern.)

Harrison, Gorham.—Rockford, Ill. (Oldsmobile.)

Harrison, O.—Washington St., Woodstock, Ill. Garage.

Harrolds Motor Car Co.—233 W. 54th St., New York City. (Pierce Arrow.)

Harrison Auto Co.—212 Union St., Providence, R. I. Garage.

Hart & Hegeman Mfg. Co.—Hartford, Conn. Mfrs. electric switches. Cap., \$21,000. Est. 1890. A. H. Pease, Pres.; Shiras Morris, Sec. and Treas.

Hart, A. V.—30 Carleton St., Rochester, N. Y. (Thomas Flyer, Elmore, Haynes, Studebaker, Columbus.)

Hart, Howard S.—Pres. Corbin Motor Vehicle Corp., New Britain, Conn.

Hart, J. M.—Oroville, Cal. (Rambler, Reo.)

Hart Mfg. Co.—370 Atlantic Ave., Boston, Mass. Mfrs. trunk racks.

Hart, Maxwell S.—Vice-Pres. and Treas. Corbin Motor Vehicle Corp., New Britain, Conn.

Hartel, J. V.—Doylestown, O. (Holsman.)

Hartford Auto Body Works.—809 Asylum Ave., Hartford, Conn. Mfrs. wood and metallic bodies, automobile tops, glass wind shields.

Hartford Auto Parts Co.—Howard Bldg., Hartford, Conn. Mfrs. steering apparatus, universal joints.

Hartford, Edward Vassallo.—Sec. Great Atlantic & Pacific Tea Co. B. Orange, N. J., May 28, 1870. Ed. Orange High School, Stevens Institute, 1892. Pres. Hartford Suspension Co., Sec. Great American Tea Co. Mem. Deal Country, Orange Camera. Res., Deal, N. J. Office, 67 Vestry St., New York.

Experimented with automobiles in France in 1897, and about this time brought a 2½ hp. De Dion tricycle to America.

Hartford, J. A.—Sec. Hartford Suspension Co., 212 W. 88th St. and 67 Vestry St., New York City.

Hartford Machine Screw Co.—476 Capitol Ave., Hartford, Conn. Mfrs. steel balls, bolts and nuts, brake and clutch cork inserts, ball cups, cups and cones, gear blanks, gear wheels, metal gear wheels, hub caps, hub flanges, special automobile machinery, machine work to order, nipples, nuts and lock washers, screw machine products, screws, washers.

Hartford Pattern & Model Co.—14 Hicks St., Hartford, Conn. Mfrs. patterns.

Hartford Rubber Works Co.—691 Park St., Hartford, Conn. Mfrs. pneumatic, solid and cushion tires. Mem. M. & A. M. Est. 1881. J. D. Anderson, Pres.; V. B. Lang, Vice-Pres. and Gen. Mgr.; E. R. Benson, Sec.; Henry Plow, Treas. Branches: Atlanta, Ga., 55 Auburn Ave.; Boston, 492 Atlantic Ave. and 1020 Boylston St.; Buffalo, 725 Main St.; Chicago, 83 Michigan Ave.; Cleveland, 1831 Euclid Ave.; Denver, 1564 Broadway; Detroit, 256 Jefferson Ave.; Los Angeles, 1505 S. Main St.; New York, 88 Chambers St. and 1773 Broadway; Philadelphia, 1425 Vine St.; San Francisco, 423-433 Golden Gate Ave. Agencies: Campana Mexicana de Vehiculos Electricos, Mexico City; Gugler Electric Mfg. Co., Minneapolis, Minn.; Keenan Co., F. P., Portland, Oregon; Mercantile Lumber & Supply Co., Kansas City, Mo.; Perry & Co., Geo. W., St. Louis, Mo.; Pittsburg Rubber Co., 913-15 Liberty Ave., Pittsburg, Pa.; Salt Lake Hardware Co., Salt Lake City, Utah.

Hartford Suspension Co.—67 Vestry and 212 W. 88th Sts., New York City. Mfrs and dealers Truffault-Hartford shock absorbers. Importers Gobron-Brillié cars. Mem. M. & A. M. Est. 1904. Cap., \$100,000. E. V. Hartford, Pres.; A. G. Hoffman, Treas.; J. A. Hartford, Sec. Garage, 30 cars; repairing.

Hartigan, F. L.—5206 Lake Ave., Chicago, Ill. Garage.

Hartley, C. H.—Waynesburg, Pa. (Maxwell.)

Hartley, S. W.—Designer and Supt. Cleveland Motor Car Co., Cleveland, O.

Hartman & Co., Ltd.—230 Main St., Nashua, N. H. (Franklin.)

Hartog, A.—303 West 54th St., New York City. Garage.

Hartwell, Guy J.—Mobile, Ala. (Glide.)

Hartz, M. M.—23d and Spring Garden Sts., Philadelphia, Pa. Garage.

Harvard Automobile Co.—1230 Massachusetts Ave., Cambridge, Mass. Garage.

Harvard Marine & Auto Co.—25 Eliot St., Cambridge, Mass. Mfrs. gasoline automobile and marine motors. Garage.

Harvey Chemical Co.—Lafayette, Ind. Mfrs. polishes.

Harvey, E. J.—Vice-Pres. and Supt. Harvey Spring Co., Racine, Wis.

Harvey, Fred P.—Salesman Cartcar Co., 7 W. 60th St., New York City.

Harvey, L. B.—Bet. M and N Sts., Sacramento, Cal. (Rambler.)

Harvey Spring Co.—Racine, Wis. Mfrs. automobile springs. Est. 1889. W. J. Harvey, Pres.; E. J. Harvey, Vice-Pres. and Supt.; W. T. Harvey, Sec. and Treas.

Harvey, W. J.—Pres. Harvey Spring Co., Racine, Wis.

Harvey, W. T.—Sec. and Treas. Harvey Spring Co., Racine, Wis.

Hasbrouck Motor Works, Inc.—155 Water St., New London, Conn. Mfrs. gasoline marine motors. (Rambler.)

Haschke Compound Storage Battery Co.—89 Ashland Blvd., Chicago, Ill. Mfrs. storage batteries.

Hase, Chas. F.—Sec. and Treas. A. O. Smith Co., Park and Clinton Sts., Milwaukee, Wis.

Haseltine, W. E.—Head of Motor Dept., Holtzer-Cabot Electric Co., Brookline, Mass.

Haskell Bros.—Washington and Wabash Aves., Chicago, Ill. Mfrs. automobile trunks.

Haskins, E. E.—Mechanical Engineer. Motor Car Dept., Fiss, Doerr & Carroll Co., 153 E. 24th St., New York City.

Hass Electric & Mfg. Co., R.—Springfield, Mass. (De Luxe, Kisselcar.)

Hassell Wagon & Harness Co.—Broadway and Hudson Ave., Albany, N. Y. Garage.

Hassenflue, J. W.—Prop. Central Motor Car Co., 150 S. Howard St., Akron, Ohio.

Hassler Co., Owen C.—1543 Milwaukee Ave., Chicago, Ill. Mfrs. metal polishes.

Hastings, H. N.—Vice-Pres. Tanberg Auto Co., cor. Gibson and River Sts., Eau Claire, Wis.

Hastings Imp. Co.—Hastings, Neb. Garage.

Hatch.—An opening in a vessel's deck affording access to the hold; also its cover.

Hatch Accumulator Co.—Charlestown, Boston, Mass. Mfrs. storage batteries.

Hatch, Wm. F.—Head of Paint Shop, Graves & Congdon Co., Oak St., Amesbury, Mass.

Hatch, Mason Barrows.—Sales Mgr.,

E. R. Thomas Motor Co. B. Jamestown, N. Y., July 23, 1877. Ed. public school and graduate of University School of Cleveland, U. S. A., class of '96. Mem. Buffalo, A. C., Cleveland A. C., A. A. A. Res., 10 Melton Manor, Buffalo, N. Y. Office, 1200 Niagara St., Buffalo, N. Y.

Photo by Spomer & Wells

In the automobile trade since June, 1904.

Hatcher & Caldwell.—Springfield, Ill. (Glide.)

Hatcher Auto Parts Co.—2108 Superior Ave. Viaduct, Cleveland, O. Mfrs. ball check valves, sight feed oilers, universal joints, crimping tools, tank strainers, pipe couplings, transmissions, engine oilers, grease cups, clutches and brakes, stampings, nipples. Cap., \$30,000. Est. Nov., 1904. Wm. A. Hatcher, Pres.; Chas. S. Beardsley, Vice-Pres.; T. J. Moffett, Sec. and Treas.; Wm. A. Cluff, Mgr.; W. H. Doddridge, Supt.

Hatcher, Wm. A.—Pres. Hatcher Auto Parts Co., 2108 Superior Ave. Viaduct, Cleveland, O.

Hatfield, A. D.—Sec. and Treas. Royal Motor Car Co., Gordon Park Blvd. and Lake Shore tracks, Cleveland, O.

Hatfield Motor Vehicle Co.—Miami-sburg, O. Mfrs. gasoline automobiles.

Hathaway, Gardner R.—Marblehead, Mass. (Ford.)

Hathaway, J. S.—Mgr. Boston Branch The White Co., 320 Newbury St., Boston, Mass.

Hathaway, S. T.—111th and Wewatta Sts., Denver Colo. (Indian.)

Hathaway, W. H. H.—Sec. and Mgr. Crescent Automobile & Machine Co., cor. E. 2d and Marr Sts., Fond du Lac, Wis.

Hathorn Auto Co.—Cor. 5th and Washington Sts., Mason City, Ia. (Winton, Cadillac, Northern, Buick, White.) Est. Oct., 1906. Cap., \$10,000. Chas. Edw. Hathorn, Pres. and Treas.; Wm. H. Hathorn, Sec. and Sales Mgr. Garage, 30 cars; repairing.

Hathorn, Chas. Edw.—Pres., Treas. and head of Mechanical Dept., Hathorn Automobile Co., cor. 5th and Washington Sts., Mason City, Ia.

Hathorn, Wm. H.—Sec. and head of Sales Dept., Hathorn Auto Co., cor. 5th and Washington Sts., Mason City, Ia.

Hatil, W. L.—Mgr. Central Auto Station, 236 Main St., New Britain, Conn.

Hauk-Seebach Co.—291-295 Essex St., Brooklyn, N. Y. Mfrs. acetylene generators, oil cans, oil guns, oil pumps.

Haug Bros. & Nollermoe Co., Ltd.—Henry Ave. and Fountain St., Winnipeg, Canada. (Glide.)

Havana Garage Co.—Zulett 28, Havana, Cuba. Garage.

Havemeyer Oil Co.—80 Broad St. and 1906 Broadway, New York City. Mfrs. grease and oils.

Havemeyer, T. A.—Pres. Cryder & Co., 583 Park Ave., New York City.

Haven, Herbert.—1618 Wazee St., Denver, Colo. (Lambert, Atlas, Cameron.)

Havens, Beckwith.—Tivoli and Red Hook, N. Y. (Waltham.)

Havens Co.—Kokomo, Ind. Mfrs. wood and metallic bodies.

Havens, John.—Washington, N. C. (Cadillac.)

Haverhill Fire Appliance Co.—Office, 40 Merrimack St.; factory, Island Park, Haverhill, Mass. Mfrs. fire extinguishers. Cap., \$50,000. Est. July 3, 1902. M. S. Whitcomb, Pres.; J. C. Hayes, Treas.; H. Mitchell, Clerk; E. B. Fuller, Sec.

Haverstraw Garage, The.—Haverstraw, N. Y. Garage.

Haviland, C. G.—27 Stevens St., Danbury, Conn. (Ford.)

Hawk, Frank.—Angola, Ind. (Cadillac.)

Hawkes, Wm. W.—Pres. and Treas. Charles Wing & Co., Amesbury, Mass.

Hawkey & Kelder.—34 Market St., Poughkeepsie, N. Y. (Maxwell.)

Hawkeye Wrench Co.—Marshalltown, Ia. Mfrs. wrenches.

Hawkins, A. F.—Chief Machinist, Hays Bros., 109 S. 4th St., Waco, Tex.

Hawkins, C. A.—Mgr. San Francisco branch, The White Co., 1760 Market St., San Francisco, Cal.

Hawkins, Chas. T.—Erie, Pa. (Knox.)

Hawkins, H. H.—Pur. Agt. Oscar Lear Auto Co., Springfield, O.

Hawkins, H. I.—Downers Grove, Ill. Repairing.

Hawkins, R. E.—Vice-Pres. and Sales Mgr. Gaeth Auto Works, 2553 W. 25th St., Cleveland, O.

Hawkins, W. A.—Commercial Mgr. Ford Motor Co., Detroit, Mich.

Hawkins, W. S. L.—Treas. and Gen. Mgr. Fisk Mfg. Co., Walker St., Springfield, Mass.

Hawkinson, O.—Maynard, Minn. (Waltham.) Est. Oct., 1906. Garage; repairing.

Hawkrige, Edwin.—Pres. Cape Ann Tool Co., Granite St., Pigeon Cove, Mass.

Hawkrige, J. F.—Vice-Pres. Cape Ann Tool Co., Granite St., Pigeon Cove, Mass.

Hawley Automobile Co., Ltd.—Constantine, Mich. Mfrs. gasoline automobiles.

Hawley, F. B.—Treas. and Mgr. Spring Perch Co., 232 John St., Bridgeport, Conn.

Hawley, Geo. E.—Sec. and Treas. Gray Hawley Mfg. Co., 605-609 W. Fort St., Detroit, Mich.

Hawley, O. P.—Vice-Pres. Gray, Hawley Mfg. Co., 605-609 W. Fort St., Detroit, Mich.

Hawley, Wm. J.—227 S. Main St., Canandaigua, N. Y. Garage.

Haws, F. A.—Partner Geo. A. Haws, 73 Pine St., New York City.

Haws, George A.—73 Pine St., New York City. Mfr. cylinder oil, transmission gear case compound, anti-fluid, cup grease. Cap., \$35,000. Not inc. Est. 1870. Co-partnership F. A. Haws and M. J. Martin, operating under above title.

Hawse-pipe.—A hole through which a boat's cable runs out.

Hay-Berg Motor Car Co.—Burleigh and Well Sts., Milwaukee, Wis. Mfrs. gasoline automobiles.

Hay, W. R.—Pres. and Gen. Mgr. Sturgeon Bay Boat Mfg. Co., Sturgeon Bay, Wis.

Hayden Co., N. L.—Columbus, O. Mfrs. axles, clutches, gasoline automobile motors.

Hayden, H. W.—Pur. Agt. Dayton Motor Car Co., Dayton, O.

Haydenville Co.—Haydenville, Mass. Mfrs. brass pipe fittings.

Haydock Automobile Mfg. Co., D. W.—5975 Cote Brillant Ave., St. Louis, Mo. Makers of the Cosmopolitan car; first marketed in 1906. Cap. \$100,000. D. W. Haydock, Pres., Treas., Gen. Mgr., Purch. Agt. and Advt. Mgr.; G. A. Anderson, Vice-Pres.; L. N. Haldock, Sec.; Winters Haydock, Designer and Supt.; C. L. Haydock, Sales Manager.

Haydock, C. L.—Sales Mgr. D. W. Haydock Automobile Mfg. Co., 5975 Cote Brilliant Ave., St. Louis, Mo.

Haydock, D. W.—Pres., Treas., Gen. Mgr., Pur. Agt. and Advt. Mgr. D. W. Haydock Automobile Mfg. Co., 5975 Cote Brilliant Ave., St. Louis, Mo.

Haydock, L. N.—Sec. D. W. Haydock Automobile Mfg. Co., 5975 Cote Brilliant Ave., St. Louis, Mo.

Haydock, Winters.—Designer and Supt. D. W. Haydock Auto Mfg. Co., 5975 Cote Brilliant Ave., St. Louis, Mo.

Hayes & Dam.—Honolulu, Hawaiian Islands. (Frayer-Miller.)

Hayes, A. H., Jr.—428 Golden Gate Ave., San Francisco, Cal. (Rainier, Frayer-Miller, F. N. Motorcycles.)

Hayes, C. F.—Riverton, Ia. Garage.

Hayes Foundry Co.—Lynn, Mass. Mfrs. gray iron castings.

Hayes, J. C.—Treas. Haverhill Fire Appliance Co., office, 40 Merrimack St., factory, Island Park, Haverhill, Mass.

Hayes Mfg. Co.—360-370 Maybury Ave., Detroit, Mich. Mfrs. wood and metallic bodies, battery boxes, tool boxes, dashes and fenders, drip pans, hoods, mufflers.

Hayes, Walter.—1116 Main St., Buffalo, N. Y. (Jewel White.) Supplies.

Haynes, A. K., & L. B.—144 N. Washington St., Rome, N. Y. Garage.

Haynes Automobile Co.—1420 Michigan Ave., Chicago, Ill. Est. 1902. J. B. Derbler, Mgr. (Haynes.) Repairing Haynes cars only.

Haynes Automobile Co., The.—Main St., Kokomo, Ind. Makers of the Haynes car; first marketed in 1905. Twelve models made since. Cap. \$300,000. Elwood Haynes, Pres., Gen. Mgr. and Designer; C. C. Cartwright, Vice-Pres.; C. H. Haynes, Sec., Treas. and Purch. Agt.; Herbert Muden, Supt.; C. B. Warren, Sales and Advt. Mgr.; James Worthington, Asst. Designer. Branch Managers: J. B. Deibler, Chicago, Ill.; E. W. Headington, New York City.

Haynes Automobile Co.—1715 Broadway, New York City. (Haynes.) E. W. Headington, Mgr. (Repairing Haynes cars only.)

Haynes Automobile Co.—220 S. 6th St., Minneapolis, Minn. (White.)

Haynes Automobile Co.—317 Robert St., St. Paul, Minn. Garage.

Haynes Automobile Co.—1310 Staunton Pl., Washington, D. C. (Haynes.)

Haynes, C. E.—Cadillac, Mich. (Elmore.)

Haynes, C. H.—Sec., Treas. and Pur. Agt., Haynes Automobile Co., Main St. Kokomo, Ind.

Haynes, Elwood.—Pres. and Chief Engineer Haynes Automobile Co. B. Portland, Ind., Oct. 14, 1857. Ed. Portland public school. Worcester Polytechnic, Johns Hopkins University. Director Haynes Automobile Co. Mem. Chicago A. C. Res., 27 North Washington St., Kokomo, Ind. In the trade since 1893. Used first car 1894.



Haynes, F. J.—Supt. H. H. Franklin Mfg. Co., 302 S. Geddes St., Syracuse, N. Y.

Haynes, John W.—Asst. Sales Mgr. Dragon Motor Co., 31st, 32d and Chestnut Sts., Philadelphia, Pa.

Haynes Motor Car Co.—1030 Golden Gate Ave., San Francisco, Cal. (Haynes.) Repairing.

Hayney, Geo. F.—Lynn, Mass. Mfrs. mufflers.

Hays Bros.—109 S. 4th St., Waco, Tex. (Buick.) Est. 1905. Not inc. T. D. Hays and W. B. Hays, head of departments; A. F. Hawkins, Chief Machinist.

Hays, Carl W.—Lexington, Mo. (Monarch.)

Hays, David.—Supt. Healy Leather Tire Co., 90 Gold St., New York City.

Haythorn, J. W.—Richmond, Ill. Garage.

Hayward & Co., S. F.—20 Warren St., New York City. Mfrs. fire extinguishers.

Hayward, C. B.—Editorial Dept., The Automobile, Flatiron Bldg., New York City.

Haywood & Summers.—Romney, Ind. (Ford.)

Haywood, M. E.—Head Repair Dept., Fisher Auto Co., 330 N. Ill. St., Indianapolis, Ind.

Hazard Mfg. Co.—Wilkesbarre, Pa. Mfrs. insulated wire.

Head.—The height in a reservoir of a body of fluid which determines the pressure at any given point below the surface. (2) The upper part of a mechanism or tool, as of a connecting-rod, cylinder, hammer, etc. ((3) The projection on a cam. See Cam.

Head, Combustion.—See Combustion-chamber.

Head-light.—A projector destined to show the road for an automobile. It is supplied either with acetylene or electricity (batteries or dynamo). When the head-light is supplied by a separate generator, it is called "searchlight."

Head-valve.—See Valve, Head.

Header.—A receptacle on the top of a boiler in which steam can collect, and from which the steam-pipe leading to the cylinder runs.

Headington, E. W.—Mgr. New York Branch Haynes Automobile Co., 1715 Broadway, New York City.

Heagle, James.—Cor. 1st and Market Sts., Johnstown, N. Y. Mfrs. wearing apparel, gloves and gauntlets.

Heald & Co., J. C.—Independence, Ia. (Winton.)

Heald, J. Franklin.—Sheridan, Wyo. (Jewel.)

Heald Mach. Co.—Worcester, Mass. Mfrs. special automobile machinery.

Healy & Co.—51st St. and Broadway, New York City. Mfrs. wood and metallic bodies.

Healy, Frank.—Partner Healy Leather Tire Co., 90 Gold St., New York City.

Healy Leather Tire Co.—90 Gold St., New York City. Mfrs. leather tires, rubber inner tubes, non-skids. Est. 1906. Frank Healy and Raymond Healy, part-

ners; David Hays, Supt.; Raymond Healy, Mgr. Branches: Boston, 10 Columbus Ave., W. A. Moody, Mgr.; Chicago, 1251 Michigan Ave., F. W. Wood, Mgr.; New York City, 1906 Broadway, H. L. Graff, Mgr.

Healy, Raymond.—Partner and Mgr., Healy Leather Tire Co., 90 Gold St., New York City.

Hearsey Vehicle Co.—113 W. Market St., Indianapolis, Ind. (White, Rambler, Marmon.)

Hearth.—The part of a forge containing the fire.

Hearth, Open.—A process for the production of steel from pig iron in a reverberatory furnace, as distinguished from the cementation or Bessemer processes.

Heat.—The cause of a rise of temperature of bodies. Its real nature, like that of light and electricity, is unknown. Considered from a general point of view, heat is one of the forms of "energy." Modern science, as we know, is but a study of the transformations of energy. Now an intimate connection exists between the different forms of energy (calorific energy, mechanical energy, electric energy, chemical affinity), and, to a certain quantity of heat, usefully absorbed, say in a gasoline motor, corresponds a certain quantity of work in mechanical energy. Every form of energy, moreover, can be transformed, directly or not, into another form. Calorific energy is, in a manner, an inferior form of energy, since it is the final point of every transformation, and the form in which losses (heat resulting from the friction of parts in motion, heating of wires conducting electricity, etc.) manifest themselves. The "degree of heat" defines the temperature. It is estimated by means of a thermometer, an apparatus based upon the expansion of bodies. The "quantity of heat" defines the calorific energy.

It is estimated by means of a calorimeter, and is expressed in calories. See Calories.

Heat disengaged by the combustion of gasoline in a motor—M. L. Lacoïn, and, with him, a number of engineers, admit that the heat disengaged by the combustion of gasoline in a motor is thus distributed: 20 per cent. in effective work; 20 per cent. in the exhaust; 60 per cent. through the walls, say, $2\frac{1}{2}$ times that which is employed in the effective work.

A 1 h.p. motor develops 75 kilogrammetres (543.75 foot-pounds) per second, and as 425 kilogrammetres (3080 foot-pounds) are equivalent to 1 calorie, 1 h.p. corresponds to 0.1765 of a calorie per second. The loss through the walls is consequently $0.1765 \times 2.6 = 0.441$ of a calorie per horse-power per second.

Heat, Convection of.—A physical phenomenon which occurs when a warm body is surrounded by a gas or liquid. The molecules of such gas or liquid expand in contact with the warm body, ascend, and are replaced by other molecules, which, in turn, undergo the same phenomenon. There are then produced ascending and descending gaseous or liquid currents called "convection currents." Honeycomb radiators lose much heat by convection and little by radiation. With gilled-tube radiators the contrary is the case. The fan used in connection with radiators performs the function of a convection apparatus by creating currents of air that are particularly valuable for cooling the motor during an inoperative state.

Heat, Latent.—The quantity of heat necessary to produce a change in the physical state of unit mass of a substance, without producing any change in temperature. For example, 536 calories are necessary to convert one gramme of boiling water into steam at 212° F. (100° C.); therefore, 536 is the latent heat for the physical change involved, that is to say, the vaporization of water.

Heat, Radiant.—Heat which passes from a hot body or source through an intervening intermedium which transmits, but does not absorb it.

Heat-radiator.—See Radiator.

Heat, Specific.—When the same quantity of heat is communicated to equal weights of two different bodies, the temperature is not the same in both, but is proportional to a factor called "specific heat." The phenomenon become easily comprehensible if we suppose two cylinders of different diameters into which the same quantity of water is put. The height of the water will evidently not be the same in both cylinders.

Thus, the specific heat of cast iron is 0.13, and that of brass 0.09. If 100 calories be furnished to a pound of these two metals, the temperature of the iron will be increased by 13 degrees, while that of the brass will be increased by but 9.

Heat, Unit of.—One British thermal unit (B. t. u.) is the amount of heat which will raise 1 pound of water 1° F., viz., from a temperature of 60° F. It is equivalent to the work of lifting 772.55 pounds one foot in height, or to lifting a weight of one pound through a vertical distance of 772.55 feet. The unit of heat is sometimes called "one-pound-degree Fahrenheit." It is equal to 251.9 French units of heat called "calories," or therms. See Calories.

Heath, C. H.—Fort Dodge, Ia. Garage.

Heath Dry Gas Co.—1937 Broadway, New York City. Mfrs. carburetters.

Heath, Ed.—Oxford, Ind. (Haynes.)

Heath, Mark W.—Mgr. Chicago Branch Witherbee Igniter Co., 1429 Michigan Ave., Chicago, Ill.

Heath, Walter C.—Treas. Webb Mfg. Co., 60 Shipman St., Newark, N. J.

Hebb, George A.—70 William St., Newark, N. J. Mfr. machinery and seat springs.

Heck—6 Place Voltaire, Paris, France. Mfr. storage batteries.

Heck, Chas.—Nashville, Tenn. Garage.

Heck, H. A.—119 Main St., Spring City, Pa. Garage.

Heckler, T. C.—222 Penn St., Reading, Pa. Garage.

Hecto.—A prefix in the metric system to denote a multiple of 100 times the measure to which the prefix is applied.

Hector, C. B.—103 Main St., Napa, Cal. (Rambler, Napier, Waltham.)

Hectowatt-hour.—An electrical unit of energy, equivalent to watt-hours. See Watt-hour.

Hedge, E. P.—107 Lincoln Ave., Hastings, Neb. (Cadillac.)

Hedge, Homer Washington.—Publicity promoter. B. Norwich, Conn., Sept. 29, 1863. Ed. public and private schools. Pres. Homer W. Hedge Co. Mem. A. C. A., Aero C. A., N. Y. Golf. Res., Hotel Aberdeen, 17 W. 32d St.; office, 11 W. 32d St., New York City. Used first car (Columbia Electric) 1899. Was first sec. and charter member of A. C. A. Founder of Aero Club of America. Recreations, automobiling, golf, horseback riding.

Hedgeland Mfg. Co.—Canton, O. Mfrs. differential gears.

Hedges Cycle Co.—Main St., Foxboro, Mass. Garage.

Hedges, S. P.—13 Main St., Greenport, N. Y. (Ford.)

Hedges, W. H.—Wainscott, N. Y. Garage.

Heer, Chris.—Pres. and Gen. Mgr. Ideal Mfg. Co., Portsmouth, O.

Hefter, Jos.—15 Oak Grove Ave., Buffalo, N. Y. Mfr. paints.

Hege Co., Oscar F.—317 Main St., Winston-Salem, N. C. (Cadillac.) Est. 1896. Cap., \$3,000. O. F. Hege. Gen. Mgr. Garage, 10 cars; repairing; supplies.

Hege, O. F.—Gen. Mgr. Oscar F. Hege Co., Winston-Salem, N. C.

Heideman, George H.—Sec., Treas. and Mgr. Knoblock-Heideman Mfg. Co., So. Bend, Ind.

Heidingsfeld, Ben.—Vice-Pres. and Treas. The Cincinnati Electric Tool Co., 650-652 Evans St., Cincinnati, O.

Heierman & Bros., Frank.—117-123 E. 5th St., Austin, Tex. (Jewel.) Repairing.

Height Over All.—The distance from the ground to the uppermost part of a

car. If the car is provided with a top, the height over all includes the top.

Heilbronner Fahrzeugfabrik.—Heilbronn, Germany. Mfrs. gasoline automobiles.

Heilbronn Fahrzeugfabrik Inhaber Paul Gunther.—Heilbronn, Germany. Mfrs. bodies.

Hein & Casper.—501 Broadway, Milwaukee, Wis. Garage.

Hein, Burchard R.—Sec., Treas. and Mgr. Liberty Association, 12 State St., Chicago, Ill.

Hein, Josiah T.—Pres. Liberty Assn., 12 State St., Chicago, Ill.

Hein und Wegelin.—Oberhausen, Germany. Mfrs. motorcycles.

Heindel, C. H.—Pres. Heindel Mfg. Co., Hanover, Pa.

Heindel Co., H. A.—Wilmington, Del. Mfrs. gasoline marine motors.

Heindel Mfg. Co.—Hanover, Pa. Mfrs. crank cases and cylinders. Cap., \$50,000. Est. 1902. C. H. Heindel, Pres.; W. F. Kintzing, Sec., Treas. and Gen. Supt.; A. R. Lentz, Asst. Supt.

Heine Velox Motor Car Co.—San Francisco, Cal. Mfrs. gas, commercial automobiles.

Heineman, Pearson.—1018 S. Main St., Los Angeles, Cal. Supplies.

Heininger, Max.—29 Coulouvrenière, Geneva, Switzerland. Mfr. coils.

Heinz.—27 rue Cave, Levallois-Perret, France. Mfr. storage batteries.

Heinze Electric Co.—Lowell, Mass. Mfrs. spark coils.

Heinzerling, A. W.—Sec. and Treas. and Gen. Mgr. Puget South Auto Co., 1405-7 Broadway, Seattle, Wash.

Heiser, August.—Gen. Supt. Churchill Cabinet Co., 72 Churchill St., Chicago, Ill.

Heitger Carburetter Co.—205-207 W. South St., Indianapolis, Ind. Mfrs. carburetters.

Held, A. S.—Freeport, Ill. (Winton.)

Hele-Shaw Patent Clutch Co., Ltd.—36 Chatham St., Liverpool, England. Mfrs. clutches.

Heifer, Wm. T.—Sales Mgr. Springfield Metal Body Co., Birney Ave., Springfield, Mass.

Helfrich, Geo.—Asst. Sec. and Office Mgr. Willyoung Appliance Co., Ludlow Station, Yonkers, N. Y.

Helical Gear.—See Gear, Helical.

Helical Spring.—See Spring, Helical.

Helicopter.—A flying machine in which the lifting action is brought about by two horizontal propellers revolving in opposite directions.

Helios Electricitäts Actien Gesellschaft.—Köln-Ehrenfeld, Germany. Mfrs. gas commercial automobiles. (Hagen trucks.)

Helios Mfg. Co.—Bridesburg, Philadelphia, Pa. Mfrs. lamps, storage batteries, ignition batteries, switches, switch and

panel boards; watt meters. Cap. \$250,000. Est. 1890. King Upton, Pres.; G. H. Rettew, Vice-Pres. and Gen. Mgr.; A. P. Swoyer, Treas. and Sec.; W. M. States, hd. Accounting dept.; G. W. Rettew, hd. Sales dept.; F. W. Braddock, hd. Mfg. dept.; F. J. Blount, hd. Battery dept.; Thos. Spencer, hd. originating and experimental dept.

Heller, F. L.—Caldwell, N. J. (Lambert.)

Heller, Ira S.—Director The Breeze Carburetter Co., 276 Halsey St., Newark, N. J.

Heller, L. L.—1015 Kilmer Bldg., Binghamton, N. Y. (Marmon.)

Heller-Spaw Motor Car Co.—Binghamton, N. Y. (Marmon.)

Hellesens Enke & V. Ludwigsen.—17 Blaagaardsgade, Copenhagen, Denmark. Mfrs. primary batteries.

Helligrass, H. M.—Locust St., Columbia, Pa. Garage.

Helm.—The apparatus, including the rudder, tiller and wheel, by which a boat is steered.

Helm, August.—10 Lützowstrasse, Frankfurt, Germany. Mfrs. jacks.

Helmer, Fred H.—Treas. American O'l Co., 170-178 S. Water St., Jackson, Mich.

Hemery, Victor.—Born at Mans Nov. 18, 1876. He first became connected with the Leon Bollée establishment, in which

he remained for seven years in the capacity of draughtsman. In 1899 he entered the Darracq establishment, where he gave his attention to racing-cars. He made his debut in the Circuit of the North in 1902. He ran the Paris-Madrid

race in 1903, and the Circuit of Ardennes in 1904. In 1905 he won the Circuit of Ardennes and the Vanderbilt cup race.

Hemperley, W. E. N.—Sec. Forest City Motor Car Co., 101-149 Walnut St., Massillon, O.

Hemwall, John.—46th St. and Washington Blvd., Chicago, Ill. (Buick.)

Hendee, Geo. M.—Pres. and Treas. Hendee Mfg. Co., 837 State St., Springfield, Mass.

Hendee Mfg. Co.—837 State St., Springfield, Mass. Makers of the Indian motorcycle, first marketed in 1901. Two models made since. Geo. M. Hendee, Pres. and Treas. Agents and Dealers: F. W. Anderson, 467 Madison Ave., Albany, N. Y.; Adams & Hart, 47 N. Division St., Grand Rapids, Mich.; Ashley, W. G., Olympia, Wash.; Baker & Co., F.



A., 37 Warren St., New York City, and 1080 Bedford Ave., Brooklyn, N. Y.; Ballou & Wright, 86 6th St., Portland, Ore.; Bissett, F. H., 529 2d Ave., S., Minneapolis, Minn.; Bridgeport Cycle Co., Bridgeport, Conn.; Clark, George F., 660 Main St., Worcester, Mass.; Connor, B. F., S. Main St., Wilkes Barre, Pa.; Cox & Sons, James F., 508 State St., New Haven, Conn.; Donahoo-Emmons & Co., 1114 I St., Fresno, Cal.; Edwards, A. G., 534 N. High St., Columbus, O.; Duquesne Cycle Co., E. E., Pittsburg, Pa.; Elizabeth Motor & Cycle Co., 16 Julian Pl., Elizabeth, N. J.; Flescher, Louis, 1622 Capitol Ave., Omaha, Neb.; Girard Cycle Co., 140 N. 14th St., Lincoln, Neb.; Hanson, Charles, 1406 Grand Ave., Kansas City, Mo.; Harrisburg Auto Co., Harrisburg, Pa.; Hathaway, S. T., 11th and Wewatta Sts., Denver, Colo.; Holden, George N., 17 Dwight St., Springfield, Mass.; Hurck Motor & Cycle Co., 109 N. 12th St., St. Louis, Mo.; Koehler Sporting Goods Co., H. J., 845 Broad St., Newark, N. J.; Krauss, Charles, 1406 Oxford St., Philadelphia, Pa.; League Cycle Store, 325 Southwest Temple St., Salt Lake City, Utah; Le Jeal Cycle & Mobile Works, 1721 Sasafra St., Erie, Pa.; Lewis, John C., 3033 Monroe St., Toledo, O.; Lyons & Co., 314 De Mers Ave., Grand Forks, N. D.; Metzger, Wm. E., 252 Woodward Ave., Detroit, Mich.; Middlesex Motor Co., New Brunswick, N. J.; Miner Co., George L., Clinton Ave., Rochester, N. Y.; Motorcycle Specialty Co., 258 Columbus Ave., Boston, Mass.; Mueller, L. J., 6417 Woodland Ave., Cleveland, O.; Neal, Clark & Neal Co., 645 Main St., Buffalo, N. Y.; Neubling, John G., 8843 Penn. Ave., Reading, Pa.; Olmstead & Son, H. R., Syracuse, N. Y.; Pickering Hardware Co., Cincinnati, O.; Ridsen, C. W., 223 W. 8th St., Los Angeles, Cal.; Robling, Edward, Scranton, Pa.; Schaeffer & Co., W. B., 11 E. 2d St., Dayton, O.; Shirley, Amos, 935 8th Ave., New York City; Skinner, L. H., Colorado Springs, Colo.; Smith, Alex., 35 Mulberry St., Hartford, Conn.; Spinning, F. M., 1310 2d Ave., Seattle, Wash.; Westing Co., G. H., 219 Massachusetts Ave., Indianapolis, Ind.; Widmayer, F. B., 2312 Broadway, New York City; Wisconsin Motorcycle Co., Monroe, Wis.; Whipple, "The Motorcycle Man," 260 W. Jackson Blvd., Chicago, Ill.; Wolf, John F., Forge and Willow Sts., Lebanon, Pa.; Swenson, B. A., 185 Prairie Ave., Providence, R. I.; Hopkins, C. C., 729 Gough St., San Francisco, Cal.

Henderson Auto Co.—4th Ave., Cedar Rapids, Ia. (Buick, Rapid, Cadillac, Franklin, Pope-Waverley.)

Henderson Bros.—Woodward Ave., Detroit, Mich. Garage.

Henderson, Corkrum & Co.—Walla Walla, Wash. (Ford.)

Henderson Iron Works & Supply Co.—Spring, Caddis & Commerce Sts., Shreveport, La. (Ford.)

Henderson, Oscar B.—Sales Mgr. Pope Motor Car Co., 139 S. East St., Indianapolis, Ind.

Henderson, R.—Asst. Marine Dept., A. A. King, Lake Hopatcong, N. J.

Henderson, Thomas.—Vice-Pres. Winton Motor Carriage Co. B. Glasgow, Scotland, Aug. 28, 1849. Director Winton Motor Carriage Co., Cleveland. Cap Screw Co., Lindsay Wire Weaving Co., West Cleveland. Banking Co. Pres. N. A. A. M., Vice-Pres. A. L. A. M. Mem. Cleveland A. C. Res. 7402 Franklin Ave., N. W., Cleveland, O. In automobile trade since 1896. Used first car 1896.



Henderson, T. N.—Mgr. Tampa Harness & Wagon Co., 1007-1009 Franklin St., Tampa, Fla.

Henderson T. W.—Mgr. Detroit Branch Winton Motor Carriage Co.

Henderson, W. G.—Sec. and Treas. Electric Storage Battery Co., Allegheny Ave. and 19th St., Philadelphia, Pa., and Pres. Electric Vehicle Co., 1 Laurel St., Hartford, Conn.

Hendricks Bros.—49 Cliff St., New York City. Mfrs. sheet and rod brass and copper.

Hendryx & Co., Andrew B.—New Haven, Conn. Mfrs. brass, bronze, aluminum and copper castings.

Henion & Hubbell.—69 N. Jefferson St., Chicago, Ill. Mfrs. fuel and air pumps.

Henke, W. O.—Greenwood Ave., Montclair, N. J. Garage.

Henkel Bros.—Brattleboro, Vt. Garage.

Henkelman, Chas. E.—1724 Atlantic Ave., Atlantic City, N. J. Est. 1905. Garage. 30 cars; repairing.

Henley, J. L.—Cresco, Ia. (Holsman.)

Henley, M. C.—Richmond, Ind. (Haynes.)

Henn, A. W.—Sec. The National-Acme Mfg. Co., cor. Stanton Ave., S. E., and E. 75th St., Cleveland, O.

Henn, E. C.—Vice-Pres. and Supt. The National Acme Mfg. Co., cor. Stanton Ave S. E. and E. 75th St., Cleveland, O.

Henne Co., Louis.—New Braumfield, Tex. Garage.

Hennegrave et Agnus.—30 rue Perrier, Levallois-Perret, France. Mfrs. storage

batteries, spark plugs, make and break plugs, high and low tension magnetos.

Henning, Fred.—Supt. Pungs-Finch Auto & Gas Eng. Co., 1524 Jefferson Ave., Detroit, Mich.

Henning, Jos. A.—205 Stevens Ave., Mount Vernon, N. Y. (Winton.)

Hendricks Novelty Co.—130 S. Capital Ave., Indianapolis, Ind. Mfrs. magnetos and ignition dynamos.

Henrique, Jean-François.—54 quai de Courbevoie, Courbevoie, France. Mfrs. primary batteries, make and break plugs.

Henry.—The unit of the co-efficient of induction (named after the English physicist, which serves for measuring the value of the self-induction and of the mutual induction of circuits.

Henry & Sheffler Co.—Greenburg, Pa. (Cameron.)

Henry Auto Co.—Edwards St., Henry, Ill. (Rambler, Holsman.)

Henry, Chester C.—Summit, N. J. (Pope-Hartford.)

Henry, Dave W.—Gen. Rep. Columbus Buggy Co., Dublin Ave. W., Columbus, Ohio.

Henry, Hugh.—Cashier and Asst. Treas. Dragon Motor Co., 31st, 32d and Chestnut Sts., Philadelphia, Pa.

Henry, Lenud et Cie.—51 rue de Turenne, Paris, France. Mfrs. electric lamps.

Henry, Walter M.—162 S. Main St., Canandaigua, N. Y. Garage.

Hensel Battery & Mfg. Co.—Michigan Ave. and Eldredge Court, Chicago, Ill. Mfrs. storage batteries.

Hensemberger.—Monza, Lombardy, Italy. Mfr. storage batteries.

Henshaw Motor Car Co.—288 Columbus Ave., Boston, Mass. (Haynes.)

Henzler, C. W.—Bismark, N. D. (Buick.)

Hepburn, J. W.—Toledo, O. Mfr. motor boats.

Hérald Société Anonyme de Moteurs et Automobiles.—5 rue Carnot, Levallois, Seine, France. Mfrs. gasoline automobiles and automobile motors. (Herald.)

Herbert, J. L.—Mgr. Iowa Vulcanizing & Tire Co., 408 Main St., Davenport, Ia.

Herbert, W. H.—3312 Wabash Ave., Chicago, Ill. Mfr. spark plugs, spark timing devices.

Herbst, Frank.—110 S. 2d St., Wilmington, N. C. (Maxwell.)

Hercules Auto Specialty Co.—115 Dearborn St., Chicago, Ill., and 936 Denver Ave., Los Angeles, Cal. Mfrs. shock absorbers, jobbers automobile specialties. Cap. \$100,000. Est. Jan., 1906. J. Arthur Scatt, Pres., Dir. and Pacific Coast Rep.; G. N. Scott, Vice-Pres.; Dr. D. W. Russell, Sec. and Treas., also Dir.; James Vidin, Dir.

Hercules Electric & Mfg. Co.—Indianapolis, Ind. Mfrs. ignition magnetos. Cap. \$15,000. Est. 1903. J. A. Kurtz, Pres.; H. G. Cox, Vice-Pres.; S. H. Kurtz, Sec. and Mgr.; Herman Hess, Supt.

Hercules Float Works.—200 Franklin St., Springfield, Mass. Mfrs. floats for carbureters, brass, bronze, composition and aluminum castings. Cap., \$5,000. Est. 1894. F. Engelhard, Treas.; F. H. Engelhard, Sec.; W. A. Engelhard, Supt.; J. J. Keveney, Supt, Foundry Dept.

Herdtlé et Bruneau.—38 bis, rue de la Chine, Paris, France. Mfrs. Hardtlé motorcycles.

Hering, W. C.—26 E. 4th St., Mansfield, O. (Jackson, Ford.)

Herkimer Automobile Club.—Wm. I. Feber, Sec., Herkimer, N. Y.

Herkimer Motor Car Co.—124-26 Albany St., Herkimer, N. Y. (Maxwell.) Supplies, garage and repairs.

Herluison, Clément.—Route de Paris, Nangis, Seine-et-Marne, France. Mfrs. automobile motors.

Herman, Andrew.—Partner National Auto Top Co., Main Office, 1904 Broadway; factory, 244-50 W. 49th St., New York City.

Hermans, F. W.—Vice-Pres. Racine Boat Co., 16th and Racine Sts., Racine, Wis.

Hermann, H. T.—Asst. Advt. Mgr. Logan Construction Co., 2d and Carrol Sts., Chillicothe, O.

Hermes, Société Italienne d'Automobiles.—Naples, Italy. Mfrs. gasoline automobiles. (Hermes cars.)

Hermitage Auto Co., The.—170 3d Ave., Nashville, Tenn. (Stevens-Dur-yea.)

Hernandez, J. C.—90 Wall St., New York City. (Locomobile.) Export only.

Herreshoff Mfg. Co.—Bristol, R. I. Mfrs. motor boats.

Herrick, A. E.—Pocono, Lake, Pa. (Elmore.)

Herrick, Bros.—Bethel, Me. (Maxwell, Reo.) Repairing.

Herring, C. M.—Pres. Jackson Motor Car Co., 103 Court St., Brooklyn, N. Y.

Herringbone-gear.—See Gear, Herringbone.

Herringbone-tread.—A pneumatic tire of which the tread is provided with V-shaped projections. See Tread.

Herron, James H.—Chief Engineer Detroit Steel Products Co., 91 E. Fort St., Detroit, Mich.

Hersant et Rousseau.—1 rue Banier, Nantes, France. Mfrs. marine motors.

Herschell-Spillman Co.—North Tonawanda, N. Y. Mfrs. gasoline automobile and marine motors.

Herz & Co.—203-5 Lafayette St., New York City. Mfrs., importers and jobbers storage batteries, gaskets, magnetos and ignition dynamos, shock absorbers, spark

coils, spark plugs, spark timers, electric switches, wire terminals, tire pumps.

Herzog, J. A.—Designer De Luxe Motor Car Co., Clark and Jefferson Ave., Detroit, Mich.

Herzog, Rudolph.—Breitestrasse 15, Berlin, Germany. Mfrs. wearing apparel, fur coats, hats and caps.

Hess & White's New Garage.—61 S. 3rd St., Newark, O. (National, Mitchell.)

Hess Automobile Co.—701 Quincy St., Brooklyn, N. Y. Garage.

Hess-Bright Mfg. Co.—19th and Hamilton Sts., Philadelphia, Pa. Mfrs. ball bearings. Mem. M. & A. M. Henry Hess, Pres. and Sec.; Fred E. Bright, Vice-Pres. and Sec.

Hess, E. J.—Pres. Hess-Pontiac Spring & Axle Co., Pontiac, Mich.

Hess, Henry.—Pres. and Sec. Hess-Bright Mfg. Co., 19th and Hamilton Sts., Philadelphia, Pa.

Hess, Herman.—Supt. Hercules Electric Co., Indianapolis, Ind.

Hess, J. Archie.—Seattle, Wash. (Corbin.)

Hess-Pontiac Spring & Axle Co.—Pontiac, Mich. Mfrs. automobile springs. Cap. \$145,000. Est. 1905. E. J. Hess, Pres.; C. W. Cathcart, Vice-Pres.; F. J. Grinelman, Sec.; B. A. Litchfield, Treas.; Jos. Obrecht, Gen. Supt.; C. W. Cathcart, Sales Mgr.

Hessels' Garage, E. S.—15 Brookfield St., White Plains, N. Y. Garage; supplies.

Heucken Söhne und Co.—Aix-la-Chapelle, Germany. Mfrs. non-skids.

Heusch, Louis.—31 rue du Marché, Paris, France. Mfr. tricars. (Lusio tricars.)

Heustis, Thos.—Bristol, R. I. Repairing.

Hewitt, B. E.—Mgr. Auto Supply Dept., Collister & Sayle, 224 Superior Ave., N. W., Cleveland, O.

Hewitt, E. L.—Purch. Agt. The White Co., Rose Bldg., Cleveland, O.

Hewitt, H. B.—Pur. Agt., Premier Motor Mfg. Co., Indianapolis, Ind.

Hewitt, H. L.—Pres. Fisher Auto Co., 330 N. Illinois St., Indianapolis, Ind.

Hewitt Motor Co.—6-10 E. 31st St., New York City. Makers of the Hewitt Touring cars, delivery, bus and 5-ton trucks. Eight different models marketed. E. R. Hewitt, Pres. and Designer; R. C. Gildersleeve, Treas.; F. E. Alden, Advt. and Gen. Mgr. Garage.

Hewitt, R. M.—Lansing, Mich. (Cartercar.)

Heyer, Arthur P.—Bloomfield, N. J. and 34 Valley Rd., Montclair, N. J. (Haynes.)

Heymann Motor Car Co.—Boston, Mass. Mfrs. gasoline automobiles.

Heywood Bros. & Wakefield Co.—174

Portland St., Boston, Mass. Mfrs. hampers.

Hibbard Automobile Co.—187 Wisconsin St., Milwaukee, Wis. (Pierce Arrow.) Oldsmobile, Haynes.)

Hibbard, Thos.—Treas. Geo. Lawley & Son Corp., 696 E. 1st St., Boston, Mass.

Hickman Automobile Co.—Attica, Ind. Garage.

Hickman, Kraemer & Croll Co.—508 Merrill Bldg., Milwaukee, Wis. (Cartercar.)

Hickok Mfg. Co., W. O.—North and Canal Sts., Harrisburg, Pa. (Mitchell.)

Hicks Speed Indicator Co.—1384 Bedford Ave., Brooklyn, N. Y. Mfrs. speedometers.

Hicks, W. R.—Mgr. Toronto Automobile Co., 6 Adelaide St., Toronto, Can.

Hiestand, Dr. Daniel.—140 N. 7th St., Allentown, Pa. (Maxwell.)

Hifnes Motor Co.—134 E. Short St., Lexington, Ky. (Pope.)

Higgins, Arthur P.—Head of Pur. Dept., Worcester Pressed Steel Co., cor. North and Barber Aves., Worcester, Mass.

Higgins, C. C.—Woodmere, N. Y. Garage.

Higgins, John W.—Sec. and Gen. Mgr. Worcester Pressed Steel Co., cor. North and Barber Aves., Worcester, Mass.

Higgins, Milton P.—Pres. Worcester Pressed Steel Co., cor. North and Barber Aves., Worcester, Mass.

Highgrade Autocar Co.—9-11 Hill St., Newark, N. J. Repairing.

Highland Park Auto Station.—Cor. Park and St. Johns Aves., Highland Park, Ill. Garage.

High Pressure.—A term applied to the cylinder of a compound engine in which the steam is expanded before passing on to the remaining cylinder or cylinders, in which the expansion is completed.

High Tension.—A term, applied to an electric current of high voltage.

Hiland Automobile Co.—5811-17 Centre Ave., Pittsburg, Pa. (Buick.) Est. Nov., 1905. Cap., \$100,000. P. R. Budd, Pres.; Geo. A. Urling, Treas.; F. D. Sanff, Sec.; W. A. Richwine, Mgr. Garage. 60 cars; repairing.



Hildebrand, Chas. Conrad.—Sales Mgr. Stevens-Duryea Co. B. Loutre Island, Mo., July 28, 1865. Ed country schools. Mem. Springfield A. C. Residence, Chicopee Falls, Mass. In the automobile trade since December, 1900. Recreation, big game hunting.

Hildreth Mfg. Co., The.—Lansing, Mich. Mfrs. marine motors, grey iron castings. Cap., \$75,000. Est. 1887. Lawrence Price, Pres.; R. H. Scott, Vice-Pres.; E. F. Peer, Treas.; E. E. Peake, Sec. and Gen. Mgr.; N. E. Hildreth, Supt. Motor Dept.; Jacob Siegreist, Supt. Foundry Dept.

Hildreth, N. E.—Supt. Motor Dept. The Hildreth Mfg. Co., Lansing, Mich.

Hildreth, P.—Franklin, Neb. Garage.

Hildreth Varnish Co.—32 Broadway, New York City. Mfrs. paints, varnishes.

Hildreth, Ward.—Vice-Pres., Treas., Sales and Advt. Mgr. Holsman Automobile Co., 662 Monadnock Block, Chicago, Ill.

Hileman, E. E.—New Castle, Pa. (Queen, Rambler.)

Hill & Holt.—Medford and Walnut Sts., Somerville, Mass. (Columbia, Rambler, Maxwell.)

Hill & Kennedy.—24 Main St., Batavia, N. Y. (Maxwell.)

Hill, A. A.—Editor Automobile Dealer and Repairer, 24 Murray St., New York City.

Hill Auto Co.—Dallas, Tex. Garage.

Hill, C. F.—327 Ferry St., Easton, Pa. Garage.

Hill, Charles B.—Vice-Pres. and Gen. Mgr. Cooper-Hewitt Electric Co., 111 Broadway, New York City.

Hill, C. H.—234 Main St., Poughkeepsie, N. Y. (Reo, Premier.)

Hill, Clark & Co.—156 Oliver St., Boston, Mass. Mfrs. special automobile machinery.

Hill Co., Geo. Q.—326 A St., Boston, Mass. Mfrs. screw machine products, machine work to order, screws, stampings.

Hill, E. H.—56 Broomhall, Sheffield, England. Mfrs. circulating pumps, tire pumps, lubricators.

Hill, Eveleth V.—Sales Mgr. Worcester Pressed Steel Co., cor North and Barber Aves., Worcester, Mass.

Hill, Frederick B.—Sec., Treas. and Gen. Mgr. American Roller Bearing Co., Tripp St., South Framingham, Mass.

Hill, F. R.—Greentown, Ind. Garage.

Hill, Geo. R.—20 Main St., Towanda, Pa. (Mitchell.)

Hill, John Alexander.—Publisher. B. near Bennington, Vt., Feb. 22, 1858. Ed. public schools of Wisconsin. Worked in printing offices, 1873-78; ran locomotive eight year; contributed to technical press from 1880, founder 1885, and editor Pueblo (Colo.) Daily Press; editor Locomotive Engineering, 1888-97; Pres. and Treas. Hill Publishing Co., publishers of the American Machinist, from 1896, and Power, from 1902; Pres. Engineering and Mining Journal from 1904. Res., 80 Munn Ave., E. Orange, N. J. Address. 505 Pearl St., New York City.

Hill, J. M.—Gen. Mgr. Commercial Truck Co. of America, 1222 Arcade, Philadelphia, Pa.

Hill, J. R.—Sec., Treas. and Buyer of automobile goods, Danbury Hardware Co., 249-251 Main St., Danbury, Conn.

Hill Mfg. Co.—27 Fuller St., Buffalo, N. Y. Mfrs. tops, bodies, windshields, removable seats. Est. 1882. William Hill, Mgr.

Hill Motor Car Co.—Haverhill, Mass. (Maxwell.) Garage. Mfrs. automobiles, gasoline.

Hill Brass Co., N. N.—East Hampton, Conn., Mfrs. bells.

Hill, R. S.—78 E. Fort St., Detroit, Mich. Mfrs. gasoline marine motors.

Hillenbrand, R. J.—Pres. Cincinnati Auto Co., 215-219 E. 5th St., Cincinnati, Ohio.

Hillman Plating Co.—446 Tremont St., Boston, Mass. Mfrs. foot rests, monograms, brass and nickel plating, robe rails, tire holders.

Hill's Auto Station.—125 Church St., Willimantic, Conn. (Maxwell, Stanley, Ford.)

Hills, H. H.—Asst. Sales Mgr. Buick Motor Co., Flint, Mich.

Hills, Horace B.—5 Park Sq., Boston, Mass. (Rochet-Schneider.)

Hills Motor Car Co.—130 N. Broad St., Philadelphia, Pa. (Royal Tourist, Rochet-Schneider.)

Hilton, Chas. E.—Pres. Hydraulic Oil Storage Co., 820 Penobscot Bldg., Detroit, Mich.

Hilton Machine Works.—16 E. 3d St., Dunkirk, N. Y. Garage.

Himes-Eden Auto Co.—115 W. Maryland St., Indianapolis, Ind. Garage.

Hinchcliffe, F. A.—Mgr. Boston Branch Winton Motor Carriage Co., Boston, Mass.

Hinde & Dauch.—Sandusky, O. Mfrs. gasoline commercial automobiles.

Hinds & Coon.—126 Pearl St., Boston, Mass. Mfrs. metal polishes.

Hine Watt Mfg. Co.—60 Wabash Ave., Chicago, Ill. Mfrs. acetylene generators, lamps.

Hine, W. C.—Pres. Igniter Appliance Co., 723 Central Ave., Cleveland, O.

Hinkle, G. W.—Harvard, Ia. (Holsman.)

Hinman, B.—Newport, Vt. (Buick.)

Hinman, J.—326 Main St., Oshkosh, Wis. (Haynes.)

Hipkins, F. E.—St. Paul, Minn. (Waltham.)

Hipp, J. C.—347 Euclid Ave., Cleveland, O. (Moline.)

Hipwell Mfg. Co.—100 Worth Ave., Allegheny, Pa. Repairing.

Hirsch, Étienne.—26 rue Crussol, Paris, France. Mfrs. speed indicators, horns, electric lamps.

Hiscox, Dwight.—Pacific Coast Rep. Magnolia Metal Co., Merchants' Exchange Bldg., San Francisco, Cal.

Hisey Wolf Machine Co.—Cincinnati, O. Mfrs. special automobile machinery.

Hislop, J. A.—Sec. and head of Woodwork Dept., Buffalo Auto Body & Trimming Co., 338-40 Ellicott St., Buffalo, N. Y.

Hit-or-Miss.—In old "explosion" motors the governing was always done by "hit-or-miss," that is to say, when the motor exceeded its normal number of revolutions per minute the governor intervened and entirely closed the pipe leading the gaseous mixture to the motor or else prevented the exhaust from being effected until the motor had resumed its speed. The motor thus passed through alternations of full fuel supply or no fuel supply, which was provocative, moreover, of considerable noise and vibration. See Governing and Governor Hit-or-Miss.

Hixson-Wittmer Auto Co.—16 E. 5th Ave., Columbus, O. (Premier.)

Hjorth Wrench Co.—Jamestown, N. Y. Mfrs. tools, wrenches.

Hoar Auto Co.—Tombstone, Ariz. (Queen.)

Hobart, M. M.—Sec. Nungesser Electric Battery Co., 3519 King Ave., N. E., Cleveland, O.

Hobbie & Martin.—244 S. Chambers St., Galesburg, Ill. Garage.

Hobbie, L. W.—Hampton, Ia. (Holzman.)

Hobbs, W. F.—Pres. Bridgeport Hardware Mfg. Co., 461-9 Iraniston Ave., Bridgeport, Conn.

Hobron, T. W.—Honolulu, Hawaiian Islands. (Wayne.) Garage.

Hobson Wrench Co., The.—Indianapolis, Ind. Mfrs. wrenches.

Hodge, Dr. M. C., Jr.—308 E. Grace St., Richmond, Va. (Maxwell.)

Hodge, S. E.—Portner Southern Garage Co., 35-37 W. Mound St., Columbus, Ohio.

Hodges, C. B.—Vice-Pres. Detroit Lubricator Co., Trumbull Ave., Lincoln Ave. and G. T. Ry., Detroit, Mich.

Hodges, C. H.—Pres. Detroit Lubricator Co., Trumbull Ave., Lincoln Ave. and G. T. Ry., Detroit, Mich.

Hodges, F. W.—Sec. and Treas. Detroit Lubricator Co., Trumbull Ave., Lincoln Ave. and G. T. Ry., Detroit, Mich.

Hodges, H. B.—San Juan, Porto Rico. Garage.

Hodges, H. E.—Chairman Detroit Lubricator Co., Trumbull Ave., Lincoln Ave. and G. T. Ry., Detroit, Mich.

Hodges, W. L.—10 Woodlawn Ave., Saratoga, N. Y. (Waltham.)

Hodgkins, W.—9 Western Ave., Gloucester, Mass. Garage.

Hodgman Rubber Co.—806 Broadway, New York City. Mfrs. collapsible backs, automobile tops, wearing apparel.

Hodgson, E. F.—Dover, Mass. Mfr. portable houses.

Hoenigsberger, H. L.—Mgr. Chicago Auto Robe Supply Co., 159 Market St., Chicago, Ill.

Hofacker, A. W.—Bottineau, N. D. (Waltham.)

Hofeller Brass Foundry Co.—100 Terrace, Buffalo, N. Y. Mfrs. brass, bronze, aluminum and copper castings.

Hofeller, Julius.—Treas. Niagara Falls Brass Works, Inc., 146 Virginia St., Buffalo, N. Y.

Hofeler, Theodore.—Pres. Niagara Falls Brass Works, Inc., 146 Virginia St., Buffalo, N. Y.

Hoff, Albert.—15 Germania St., Chicago, Ill. Garage.

Hoff, H. L.—Sec., Treas. and Pur. Agt. Acme Motor Car Co., 8th and Elm Sts., Reading, Pa.

Hoff, Jos. B.—Proprietor and Mgr. Lakewood Auto Garage, 106-118 Main St., Lakewood, N. J.

Hoffecker Co., The.—Motor Mart, Park Sq., Boston, Mass. Mfrs. speedometers. Mem. M. & A. M. Cap. \$150,000. Est. 1904. Fred M. Rollins, Treas. and Mgr.; L. E. Blanchard, Supt.

Hoffer & Sons, D. B.—126 S. 10th St., Reading, Pa. (Logan, Pullman, Queen, De Luxe.)

Hoffer, Fr.—38 bis, rue Vivienne, Paris, France. Mfrs. ball bearings.

Hoffer, J. N.—Homestead, Pa. (Cameron.)

Hoffman & Billings Mfg. Co.—Milwaukee, Wis. Mfrs. brass pipe fittings, gasoline automobile motors.

Hoffman & Setzer Auto Station.—1918 Jerome Ave., New York City. Garage.

Hoffman & Shimer.—21 Broad St., Bethlehem, Pa. (Reo.)

Hoffman, A. G.—Treas. Hartford Suspension Co., 212 W. 88th St., New York City.

Hoffman, C. E.—Mgr. Sundry Dept., Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y.

Hoffman, Geo. W.—Seattle, Wash. Agt. Morgan & Wright tires.

Hoffman, Geo. W.—55 E. Washington St., Indianapolis, Ind. Mfr. metal polishes.

Hoffman Hardware Co., Jos.—Sharon, Pa. (Elmore.)

Hoffman Launch & Motor Works.—1253 N. Halstead St., Chicago, Ill. Mfrs. gasoline marine motors, motorcycles.

Hoffman Lubricating Oil Co.—Binghamton, N. Y. Mfrs. oils.

Hoffman Mfg. Co.—Chelmsford, England. Mfrs. ball bearings.

Hoffman und Co.—Neue Koenigstrasse 49, Potsdam, Germany. Mfrs. coils.

Hoffman und Schulze.—Cöthen-Anhalt, Germany. Mfrs. bodies.

Hogging.—The curvature of a vessel, girder or other structure, so that it is convex on the upper side.

Hohenshell, W. T.—Merced, Cal. (Moline.)

Hoh-Stahl Motor Co.—398 Bedford Ave., Brooklyn, N. Y. Garage.

Hokanson Auto Co.—Pinckney and Doty Sts., Madison, Wis. (Buick, Winton, Cadillac, Pope-Waverley.)

Holbrook-Armstrong Iron Co.—Racine, Wis. Mfrs. gray iron castings.

Holbrook, Henry F.—Mgr. Fickling & Co., Inc., 154 E. 57th St., New York City.

Holcker Bros. Buggy Co.—Crestline, O. (Auburn.)

Holcomb Co.—105 Goffe St., New Haven, Conn. (Cadillac, Franklin.) Garage and repairing.

Holcombe & Co.—45 Vesey St., New York City. Mfrs. primary batteries, spark coils, spark plugs.

Holcomb, H. C.—105 Goffe St., New Haven, Conn. Mfrs. wood and metallic bodies, automobile covers, lamps, automobile tops.

Holden, George N.—17 Dwight St., Springfield, Mass. (Indian.)

Holden, J. B.—Head of Motor Dept., D. M. Tuttle Co., Canastota, N. Y.

Holder, H. A.—Gallatin, Tenn. (Holsman.)

Holland & Campbell.—Clarksdale, Miss. (Buick.)

Holding-down Bolt.—See Bolt, Holding-down.

Holland Launch & Engine Co.—Holland, Mich. Mfrs. motor boats.

Holland, W. P.—Clarksdale, Miss. Garage.

Hollander, Elmer Rand.—Automobile importer. B. Boston, Mass., Aug. 16, 1870. Ed. Noble's School, Boston, Class

of 1889, Phillips Exeter Academy, Exeter, N. H. Director Fiat Automobile Co., Long Island Motor Parkway, Importers' Automobile Salon. Mem. N. Y. Club, N. Y. Comedy, Bay State A. A., A. C. A., A. C. of Turin, A. C. of Italy. Res. 1070 Madison Ave. Office, 1789-1791 Broadway.



Photo by Spenser & Wells

New York City. In the trade since 1898. First car owned in 1898, first motor-boat in 1903. Recreations: Yachting, automobile, tennis.

Hollander, Lambert.—Partner Gray & Davis, Amesbury, Mass.

Hollenback, John Welles.—Vice-Pres.

Matheson Motor Car Co., Wilkesbarre, Pa.

Holley Bros. Co.—661-75 Beaubien St., Detroit, Mich. Mfrs. carburetters and magnetos. Mem. M. & A. M. Cap. \$10,000. Est. April, 1905. G. M. Holley, Pres.; E. Holley, Vice-Pres. and Treas.; G. R. Welch, Sec.

Holley, E.—Vice-Pres. and Treas. Holley Bros. Co., 661-75 Beaubien St., Detroit, Mich.

Holley, G. M.—Pres. Holley Bros. Co., 661-75 Beaubien St., Detroit, Mich.

Holiday, J. S.—Sec. The Victor Rubber Co., Springfield, O.

Holliday Mfg. & Engineering Co.—160 Bunker St., Chicago, Ill. Mfrs. marine reverse gears, gasoline marine motors.

Hollingshead Co., R. M.—Camden, N. J. Mfrs. automobile body polishes, automobile body soaps.

Hollis, Park & Pollard.—28-30 Canal St., Boston, Mass. Mfrs. portable houses.

Hollister, H. M.—Treas. Fairbanks, Morse & Co., Franklin and Monroe Sts., Chicago, Ill.

Holloway, E. G.—Vice-Pres. J. S. Kirk & Co., 360 N. Water St., Chicago, Ill.

Hollywood Motor Co.—Newark, N. J. (Marion.)

Holm, John S.—Smithtown Branch, N. Y. Garage.

Holme, Chas. S.—Pres., Treas. and Gen. Mgr. York County Garage, Sanford, Me.

Holmes & Bros., Robert.—Danville, Ill. Mfrs. tire valves. (Holsman, Cadillac, Winton, Franklin.)

Holmes & Childs Motor Co.—355 W. 3d St., Williamsport, Pa. (Winton, Pope-Toledo.)

Holmes & Co., G. E.—1502 Michigan Ave., Chicago, Ill. (Welch, Queen.)

Holmes & Co., J.—518 Broad St., Newark, N. J. Mfrs. body irons.

Holmes Booth Auto Co.—636 55th St., Cleveland, O. (Pope-Hartford.)

Holmes Bros.—Detroit, Mich. Mfrs. automobile tops.

Holmes, Chas. M.—Asst. Gen. Mgr. United Wire & Supply Co., 109-119 Summer St., Providence, R. I.

Holmes Co., M. A.—422 Michigan Ave., E. Lansing, Mich. (Jackson.)

Holmes Fiber Graphite Co.—5155 Wakefield St., Philadelphia, Pa. Mfrs. graphite.

Holmes, F. L.—Gen. Mgr. Jackson Automobile Co., Jackson, Mich.

Holmes Motor Co.—West Mystic, Conn. Mfrs. marine motors, motor boats.

Holmes Vehicle Co.—East Boston, Mass. Mfrs. gasoline automobiles.

Holsman Automobile Co.—662 Monadnock Block, Chicago, Ill. Makers of the Holsman car; first marketed in 1903. Nine models made since. Cap. \$200,000. Henry K. Holsman, Pres. and Designer;

Ward Hildreth, Vice-Pres., Treas., Sales and Advt. Mgr.; C. B. Sholes, Sec.; W. L. Garrqd, Supt. and Purch. Agt. Agents and dealers: Auld, W. C., Green Valley, Ill. Auto Supply & Storage Co., 141 Madison Ave., Baltimore, Md. Barge & Co., Wm., Bloomfield, Neb. Bennett, C. S., Clarion, Ia. Blodgett & Co., V. E., Santa Ana, Cal. Burnett, L. H., E. Stroudsburg, Pa. Butts, C. W., Goddell, Ia. Case, S. W., Montclair, N. J. Clark, A. E., Huron, S. Dak. Clark, I. G., 616 San Antonio St., El Paso, Tex. Cleveland & Brown, Minneapolis, Kan. Cook, C. E., New London, Ia. Copelin, J. H., 223 W. 8th St., Los Angeles, Cal. Covey, York, Staceyville, Ia. Dosson Carriage Co., 909 Jefferson Ave., Toledo, O. Duck-er, A. C., Sumter, S. C. Ecker, J. D., Keokuk, Ia. Enos & Titterington, Drs., Jerseyville, Ill. Fawkes Auto Co., 111 6th St., S. Minenapolis, Minn. Fawkes Auto Co., 93 5th St., St. Paul, Minn. Featherstone, J. E., Aurora, Mo. Finks, H. P., Fort Smith, Ark. Foust & Foust, Warren, Ind. Franklin Auto Co., Frank-lin, Neb. Franklin Garage, Bridgeport, Conn. Fundlater Hardware Co., San Angelo, Tex. Fudge, L., Farmersville, O. Gebhart, E., Whitesville, Mo. Geitz, Fred., 205 N. Main St., St. Louis, Mo. Grant, W. C., Winchester, Ind. Hall, Spencer, 1401 Park St., Racine, Wis. Hartel, J. V., Doylestown, O. Henley, J. L., Cresso, Ia. Henry Automobile Co., Henry, Ill. Hobbie, L. W., Hamp-ton, Ia. Holder, Dr. H. A., Gallatin, Tenn. Holmes & Bros., R., Danville, Ill. Hunkle, G. W., Harvard, Ia. Joplin Auto Co., Joplin, Mo. Kampen & Range, Monmouth, Ill. Kappellman, J. A., Linn, Kan. King, W. H., Wilton, Me. Kin-ney & Alexander, Binghamton, N. Y. Kirkpatrick, L. B., Rochester, N. Y. Koys, A. B., Newton, N. J. Leach, Ed. E., Franklin, Pa. Le Roy Transfer & Storage Co., Le Roy, N. Y. Lovall, C. D. S., Lynn, Mass. Loyd, Dr. O. H., Hereford, Tex. Lyall & Co., J. M., Farnham, Va. McCray, Jas. E., Wapel-lo, Ia. McDonald Auto Co., Memphis, Tenn. MacKay, Heinen & Co., San Antonio, Tex. Manning, A. C., Interlak-en, N. Y. Manning, E. J., Monroe, Wis. March, A. A., 904 Benton Blvd., Kansas City, Mo. Mayer, J. W., Beatrice, Neb. Michigan Automobile & Supply Co., Me-nominee, Mich. Model Machine Works, Franklin, Ind. Molinero, M. & J., Bue-nos Ayres, South America. Monnich, Bernard, Hooper, Neb. Morris Bros. Automobile Co., Plainfield, N. J. Mose-ly, O., Peru, Ind. Miles, E. I., Newton, Ia. Miller, Wm., Thomasville, Ga. Nourse, F. R., Lewiston, Ia. Ohmacht, L. W., Cresco, Ia. Pagel, Dr. C. M., St. Paul, Ind. Peterson, Dr. W. A., Elgin, Neb. Radkey, S. B., Austin, Tex. Ran-

dolph, T., Nyack, N. Y. Scott Mfg. Co., Adel, Ia. Sharp, W. H. B., Indian Head, Sask., Can. Slagel, W. F., Bloomsburg, Pa. Snyder, Robt. J., Bethlehem, Pa. Stagg, S. G., 1308 Broad St., Richmond, Va. Steinhart-Jenson Automobile Co., Joliet, Ill. Strong, Geo., New Castle, Ind. Summer, S. J., 118 E. Ohio St., In-dianapolis, Ind. Temple Automobile Co., Temple, Tex. Tubbs, Dr. R. B., Council Bluffs, Ia. Turner, Dr. F. A., Sandwich, Ill. Tuthill, R. S., Unionville, N. J. Urquiza, M. M., Queretaro, Mex. Vaala & Natwig, Saude, Ia. Viceroy, Chas. A., R. F. D. No. 2, Hornet, Mo. Vollel, Wm., Perrysville, Ind. Weather-ford Electric Co., Weatherford, Tex. Whittington, N. T., Cayuga, Ind. Wick-strom, A. E., 1113 Broadway, Kansas City, Mo. Williams, T. J., 512 Grand Ave., Des Moines, Ia. Williamson, W. S., 220 Clifton Pl., Brooklyn, N. Y. Wills, Geo. E., Auburn, Mo. Wilson, E. C., Richfield, Kan.

Holsman, Henry K.—Pres. and De-signer Holsman Automobile Co., 662 Monadnock Block, Chicago, Ill.

Holson Motor Patents Co., Ltd.—Pythian Temple, Grand Rapids, Mich. Engaged in developing new models of wheel-motor vehicles and licensing their manufacture under patents. Built first car in February, 1904. Three models made since. Cap. \$500,000. Melvin B. Church, Pres.; M. Clay Church, Sec.; Wesley W. Hyde, Treas.; Karsten Knud-sen, Designer.

Holst Bros.—139 E. 9th St., Los An-geles, Cal. (Autocar.)

Hol-Tan Co.—244 W. 49th St., New York City. (Fiat, Hol-Tan.) Est. 1906. Cap. \$100,000. C. H. Tangeman, Pres.; Harry Fosdick, Vice-Pres. and Treas.; J. B. Hines, head Repair and Supply Dept. Repairing.

Holt & Co., W. H.—95 Pine St., Provi-dence, R. I. Machine work to order, screw machine products, screws.

Holt, E. E.—Main St., Fort Fairfield, Me. (Dolson, Reo, Waltham.)

Holt, Eugene.—Burlington, N. C. (Maxwell.)

Holt, S. H.—Treas. Billings & Spen-cer Co., Russ and Lawrence Sts., Hart-ford, Conn.

Holtzer-Cabot Electric Co.—Brookline, Mass. Mfrs. primary batteries, genera-tors, electric dynamos, charging igniters, magnetos, bells. Est. since 1875. Chas. W. Holtzer, Pres.; W. S. Kemp, Treas.; T. W. Ness, Gen. Mgr.; W. S. Kelley, Chief Eng.; W. E. Haseltine, head Mo-tor Dept.; E. L. Nichols, Adv. Mgr.; E. R. Harding, Mgr. Chicago Branch.

Holtzer, Chas. W.—Pres. Holtzer-Ca-bot Electric Co., Brookline, Mass.

Holyoke Auto Garage Co.—Division St., Holyoke, Mass. (Knox.)

Homan & Shultz.—38 W. 62d St., New York City. (Rambler, National.)

Homan, E.—Boulevard, near Lembeck Ave., Jersey City, N. J. (Rambler, National.)

Homan, J. & E.—380 W. Broadway, New York City. Mfrs. gasolene automobile motors.

Homer Brass Works.—231 Race St., Philadelphia, Pa. Mfrs. brass, bronze, aluminum and copper castings, machine work to order.

Homer Cycle Co.—Bridgeton, N. J. (Cadillac.)

Homer, Daniel.—Head of Pressed Steel Tank Dept., Nortmann-Duffke Foundry Co., 26th St. and Layton Ave., Milwaukee, Wis.

Homewood Automobile Co.—7250 Kelly St., E. E. Homewood, Pittsburg, Pa. (Frayer-Miller.)

Honeter, Roy.—117 W. Main St., Brazil, Ind. Garage.

Honey-comb Radiator.—See radiator.

Honk, R. T.—Supt. Dayton Motor Car Co., Dayton, O.

Honkawara, Paul.—Palmer, Mich. (Waltham.)

Hood.—A cover, called also a "bonnet," placed over the motor of a motor-vehicle or motor-boat. See Bonnet. (2) A covering for the body of a motor-vehicle. (3) The funnel-like cover over a forge which leads the smoke, etc., into the chimney.

Hood, Cape.—A type of vehicle-top, which is capable of being either folded or extended to some length.

Hood, Dust.—An adjustable hood designed to completely cover an automobile top and prevent dust and mud from soiling it.

Hood, Spray.—A protective covering for a motor-boat, and which is often constructed so as to open and close like a fan.

Hood, P. W.—Sec. Ventilated Cushion & Spring Co., Jackson, Mich.

Hooke, H. L.—Sec. and Treas. Muncie Auto Parts Co., Elliott St. and L. E. & W. Yards, Muncie, Ind.

Hooker, Stanley A.—216 E. 3d St., Cincinnati, O. (Maxwell, Pullman.)

Hook's Joint.—See Joint, Hooke's.

Hooper & Co., Ltd.—77 Kings Rd., Chelsea, London, S. W., England. Mfrs. tops.

Hooper & Co., Ltd.—Surrey Works, Blackfriars Rd., London, S. E., England. Mfrs. bodies.

Hoope Bros. & Darlington.—West Chester, Pa. Mfrs. wood wheels.

Hoope, Henry R.—West Chester, Pa. (Elmore.)

Hopewell Bros.—42 Osborn St., Cambridge, Mass. Mfrs. tire cases, tool

rolls, robes, automobile fabric goods. Est. 1906. Partnership.

Hopkins, C. C.—729 Gough St., San Francisco, Cal. (Indian.)

Hopkins, Samuel C.—134 Eliot St., Boston, Mass.

Hopkinson & Co., Ltd., J. E.—121 Cromer St., London, W. C., England. Mfrs. solid tires.

Hoppenyon Auto Co., The.—301 E. 2d St., Ashland, Wis. (Ford, Reo.) Est. April, 1907. B. Maytor Hoppenyon, Prop.; W. R. Wilcox and E. M. George, Salesmen; S. W. Baily and E. Edlavis, Shopmen. Branches at Hurly and Superior, Wis. Garage, 15 cars; repairing.

Hopson & Chapin Mfg. Co.—New London, Conn. Patternmakers; brass and nickel plating; machine work to order; gray iron castings.

Hora, Ltd., E. & H.—36 Peckham Rd., London, S. E., England. Mfrs. wood wheels, tops.

Horch und Co. Actiengesellschaft.—Zwickau, Germany. Mfrs. gasolene automobiles. (Horch cars.)

Horin, O.—Sales Mgr. The Cleveland Faucet Co., 706 Frankfort Ave., N. W., Cleveland, O.

Horizontal Opposed.—A term for a horizontal, multi-cylinder motor, half the cylinders of which are on one side and half on the other side of the crank-case.

Horn.—One of the tips or corners of the pole-pieces of the field-magnets of a dynamo or electric motor. (2) A common instrument of warning used on automobiles.

Horn Bulb.—An india rubber bulb for forcing air through a signal horn. See Horn (2).

Horn, Spring.—A curved support secured to the extremity of the side-member of a vehicle, and to the end of which a spring is shackled.

Horn, Geo.—Asst. Pur. Agt. C. H. Blomstrom Motor Co. and De Luxe Motor Car Co., Clark and Jefferson Aves., Detroit, Mich.

Horn, Walter B.—Director Maxwell-Briscoe Motor Co., Tarrytown, N. Y.

Hornburg Auto Co.—214 Post St., Spokane, Wash. (Dolson, Maxwell.)

Hornecker Motor Mfg. Co.—Whiting, Ind. Mfr. motorcycles.

Horner, P. B.—Hutchinson, Kan. (Cadillac.)

Hornung & Son.—Mount Pleasant, Mich. (Cartercar.)

Hornung, H. L.—Sec., Treas. and Mechanical Engineer, Waukesha Motor Co., 110 North St., Waukesha, Wis.

Horr, W. C.—Sec. and Treas. The Tucker Wood Work Co., Sidney, O.

Horsburgh & Scott Co.—Cleveland, O. Mfrs. metal gear wheels.

Horseless Age, The.—9-15 Murray St., New York City. Pub. weekly by E. P. Ingersoll. Ed. staff, P. M. Heldt, A. L. Clough, F. E. Watts, D. R. Hobart, X. P. Huddy. Business Dept., E. S. Waldteufel, Walter H. Gibson, C. N. Brauns, G. R. Purvis.

Horse-power.—See Power, horse.

Horsfall & Bickham.—Pendleton, Manchester, England. Mfrs. gasoline automobiles. (Horbick cars.)

Horstman Co., Wm. H.—5th Ave. and Cherry St., Philadelphia, Pa. Mfrs. cloth and carpet trimmings.

Horton & Co.—Mayville and Wahpeton, N. D. (Cadillac.)

Horton, Chas. A.—Pres. Duplex Roller Bushing Co., Belfast, Me.

Horton, E. P.—2 Mamaroneck Ave., White Plains, N. Y. (Maxwell.)

Horton, H. A.—127-131 Park St., New Haven, Conn. Mfrs. wood and metallic bodies.

Horton, W. F.—491 Richmond Ave., London, Ont., Canada. (Oldsmobile.)

Hose.—Flexible tubing of rubber, canvas or leather, used for the conveyance of a liquid.

Hosmer Co., G. A.—601-7 Northland Ave., Buffalo, N. Y. Office, 375 Ellicott St. Mfrs. motor oils, grease and rubber cements. Cap. \$15,000. Oliver Cabana, Jr., Pres. and Treas.; Martin J. Cabana, Sec.; Otis Bowen, Supt.

Hoster, Louis Ph.—Treas. The Barndt-Johnston Auto Supply Co., 426 Donaldson St., Columbus, O.

Hitchkin Mfg. Co., The.—1262 Michigan Ave., Chicago, Ill. Mfrs. shock absorbers.

Hotchkiss, William Horace.—Lawyer and President American Automobile Association. B. Whitehall, Washington Co., N. Y., Sept. 7, 1864. Ed. Hamilton College, A. B. 1886, A. M. 1889. Referee in bankruptcy, Erie County, N. Y. Pres. and director Lands Co. of Depew. Trustee and attorney American Savings Bank of Buffalo. Mem University. Coun-



try. Lawyers', A. C. of Buffalo. Res. 20 Lincoln Parkway, Buffalo, N. Y. Office, 700-702 D. S. Morgan Bldg, Buffalo, N. Y. Used first car in 1902.

Hotchkiss & Cie, Société Anonyme des Anciens Etablissements.—St. Denis,

Paris, France. Mfrs. gasoline automobiles. (Hotchkiss cars.)

Hot-head Ignition.—See Ignition.

Hot-short.—Iron which is brittle when hot, usually owing to the presence of sulphur.

Hot Springs Automobile Co.—207 Central Ave., Hot Springs, Ark. (Reo.)

Houben, Théodore.—Verviers, Belgium. Mfrs. non-skids, leather and solid tires.

Houdet, Ernest.—7 bis, rue de l'Urbaïne, Neuilly-sur-Seine, France. Mfrs. wood wheels.

Hough, C. Royce.—Gen. Mgr. Pope Automobile Co. of Washington, 817-819 14th St., Washington, D. C.

Hough, E. P.—Salesman Pope Automobile Co. of Washington, 817-819 14th St., Washington, D. C.

Houghteling, Jas. L.—Pres. Kalamazoo Spring & Axle Co., Kalamazoo, Mich.

Houghton & Buxton.—Worcester, Mass. Mfrs. cups and cones.

Houghton Implement Co.—201-225 N. 9th St., Grand Forks, N. D. (Jackson, Gale.) Est. 1901. Cap., \$100,000. P. S. Houghton, Pres. and Treas.; E. L. Jacob, Sec. Repairing.

Houghton, P. E.—Pres. and Treas. Houghton Implement Co., 201-225 N. 9th St., Grand Fork, N. D.

Houle Motor Works, A. J.—Holyoke, Mass. Mfrs. gray iron castings; automobile and marine motors.

Haupt, Edgar M.—Sec. and Treas. and head Garage and Machine Shop, Harry S. Haupt Co., 63d St. and Broadway, New York City.

Haupt Co., Harry S.—63d St. and Broadway, New York City; 139 S. Broad St., Philadelphia, Pa., and 213 Clinton Ave., Newark, N. J. (Thomas.) Est. 1906. Cap. \$300,000. Harry S. Haupt, Pres.; H. G. Vogel, Vice-Pres.; Edgar M. Haupt, Sec., Treas. and head Garage and Machine Shop. Garage, 150 cars; repairing.

Haupt, Harry S.—President Harry S. Haupt Co., New York, Newark, N. J., and Philadelphia. Agents for the E. R. Thomas Motor Co. Established the former concern several years ago and speedily built up a large trade.

Has been prominent in races, contests, tours, etc., in and about New York.

House & Wesley.—Market and 14th Sts., Wheeling, W. Va. (Reo, Premier.)



House, C. E.—Manchester, Conn. (Pope-Hartford.)

Houser, Orville.—101 N. Mulberry St., Chillicothe, O. Garage.

Housing.—A protective covering for any piece of mechanism.

Houston Automobile Club.—Houston, Tex. S. E. Bering, Sec.

Houston Motor Car Co.—417 San Jacinto St., cor. Prairie Ave., Houston, Tex. (Thomas, Stevens-Duryea, Cadillac, Pierce Arrow, Stoddard-Dayton.) Est. 1905. Not inc. C. F. Gydeson, Mgr. Garage, 50 cars; repairing. Branches at Austin, Beaumont, Boyan, Galveston and Victoria, Tex.

Hove & Co., C.—Minden, Neb. (Earl.)

Hovey Bushey Co.—409 Golden Gate Ave., San Francisco, Cal. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

Hovey, Geo. L.—N. Anson, Me. (Cadillac, Winton.)

Howard Auto Co.—489 Golden Gate Ave., San Francisco, Cal. (Buick, Aperson.)

Howard Automobile Co.—Des Moines, Ia. (Glide.)

Howard Automobile Station.—Howard Ave., Boston, Mass. Garage.

Howard, Case & Co.—Lethbridge, Alberta, Canada. Garage.

Howard Co., F. H.—56 Galen St., Wattertown, N. Y. (Glide.)

Howard-Crowningshield Garage, The.—619 N. Spruce St., Colorado Springs, Colo. (Premier.)

Howard, J. S.—South Los Angeles St., Anaheim, Cal. Garage.

Howard Mfg. Co.—Attleboro, Mass. Mfrs. tire shoes.

Howarth & Rogers.—Amesbury, Mass. Mfrs. wood and metallic bodies.

Howe, A. E.—Prop. Howe Motor Car Co., 11 Park Ave., Patterson, N. J.

Howe, F. D.—Designer, Waltham Mfg. Co., Waltham, Mass.

Howe Fire Engine Co.—Indianapolis, Ind. Mfrs. gasoline automobiles.

Howe Motor Car Co.—11 Park Ave., Paterson, N. J. (Reo, Premier.) Est. Oct. 1, 1906. Not inc. A. E. Howe, Prop.; J. L. Arkenhead, Mgr. Garage, 12 cars; repairing.

Howe Scale Co.—509 Market St., Philadelphia, Pa. Mfrs. gasoline marine motors.

Howe, Silas.—Pres. and Treas., Wm. D. Gibson Co., Huron and Kingsbury Sts., Chicago, Ill.

Howell & Co., T. P.—Newark, N. J. Mfrs. leathers.

Howell, Dr. Fleming.—Clarksburg, W. Va. (Waltham.)

Howell, Dr. Harrison.—Wilmington, Del. (Waltham.)

Howell, O. L.—Sec. Union Automobile & Supply Co., Plainview, Tex.

Hower, Frank B.—Chairman Touring



Board American Automobile Association and President Automobile Club of Buffalo. A prominent Buffalo motorist, donor of the Hower Trophy awarded to the contesting runabouts in the 1907 A. A. A. tour. Was in

complete charge of this tour and was both praised and blamed for his decisions on points connected with the conduct of the run.

Howlett, F. C.—Pres. and Gen. Mgr. Syracuse Rubber Co., 212-14 S. Clinton St., Syracuse, N. Y.

Hoy, P. V.—Main St., Norristown, Pa. (Pierce Arrow.)

Hoyer, T. M.—Emmetsburg, Ia. (Cadillac.)

Hoyt, Colgate.—Banker. B. Cleveland, O., 1848. Ed. Cleveland public schools, Phillips Acad., Andover, Mass. Was. Gov't. Director, 1882-84; Company Director, 1884, Union Pacific R'y.; U. S. Trustee Netherlands Fire Ins. Co.; 1st Vice-Pres. and Director Missouri, Kansas and Texas R'y. Co.; Director Boonville Bridge Co., British Columbia Copper Co., Empire State Idaho Mining and Developing Co., Missouri, Missouri, Kansas & Texas. Pope Mfg. Co., Sea & Lake Ins. Co., Trinity County Gold Mining Co., U. S. Cast Iron Pipe & Foundry Co., Oregon & Transcontinental and Oregon R'y. and Navigation Co., Northern Pacific R. R. Co. Mem. clubs: Pres. Seawanhaka-Corinthian Yacht, City Midway, Union League, Metropolitan, N. Y. Yacht. Res. 25 Park Ave. Address, 36 Wall St., New York City.

Hoyt, Dr. A. H.—Penacook, N. H. (Elmore.)

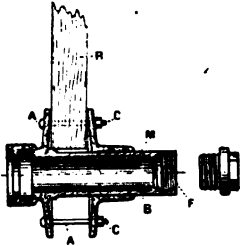
Hoyt Elevator Co.—129 Pearl St., Boston, Mass. Mfrs. drop forgings.

Hoyt, Francis C.—Sec. and Treas., B. & H. Motor Car Co., 147-51 W. 49th St., New York City.

Hoyt, Francis S.—Vice-Pres. B. & H. Motor Car Co., 147-51 W. 49th St., New York City.

Hub.—The central part of a vehicle wheel, consisting of a wooden box or nave which revolves around the axle-spindle, and the periphery of which is provided with mortises into which are

inserted the tenons of the wooden spokes.



This primitive form of wooden hub has been entirely discarded in automobilism, in which it has been replaced by what is called an "artillery hub" (see figure) of

metal with wide cheeks embracing the base of the spokes (R), which are secured thereto by bolts (A C). The hub is held in place by a nut which is screwed upon the end of the spindle. The extremity of the hub terminates in a thread (F) upon which is screwed a cap designed to retain the grease or oil and prevent access of mud or dust to the axle-box.

Hub, Artillery.—See Hub.

Hub-brake.—See Brake, Hub.

Hub-cap.—A cap placed at the extremity of a hub to prevent dirt from reaching the bearing of the wheel.

Hub, Steering.—See Steering-hub.

Hub, The.—24 Murray St., New York City. Trade News Pub. Co. Monthly.

Hub Auto Exchange.—195 Freeport St., Boston, Mass. Garage.

Hub Foundry & Plating Co., Inc.—Ossining, N. Y. Mfrs. brass, bronze, aluminum and copper castings, bronze metals.

Hub Lubricator Co.—Portland Bldg., Boston, Mass. Mfrs. spark plugs.

Hubbard, F. A.—Vice-Pres. Mianus Motor Works, Cos Cob, Conn.

Hubbard Motor Co.—Middletown, Conn. Mfrs. gasoline automobile and marine motors.

Hubbard Spring Co., M. D.—Pontiac, Mich. Mfrs. machinery springs, seat springs.

Hubbell Bros.—Kelly's Corners, N. Y. (Maxwell.)

Hubbell Co., E. G.—492 Main St., Springfield, Mass. (Crawford.)

Hubbell, Wm. K. J.—Wilton, Conn. (Mora.)

Hubble, N. B.—Monroe, Mich. (Wayne, Pope-Waverley.)

Hubeaux, F.—12 rue Montera, Paris, France. Mfrs. oil and acetylene lamps.

Huber Automobile Co.—378 Golden Gate Ave., San Francisco, Cal. (Smith, Richmond, Marvel.)

Hubner, Geo.—Supt. The Autocar Co., Ardmore, Pa.

Hudson Automobile Co.—516 W. 145th St., New York City. (Lane, Springfield.)

Hudson Automobile Garage.—1318 Park Ave., Hoboken, N. J. (Reo, Ford.)

Hudson, Chas. H.—Hudson, Ky. (Atlas.)

Hudson County Auto Co.—2593 Blvd., Jersey City, N. J. (Matheson, Winton.)

Hudson, Jas. A.—Mgr. Brazier Auto Works, 38th and Market Sts., Philadelphia, Pa.

Hudson Mfg. Co.—Hudson, Mich. Mfrs. motorcycles.

Hudson Valley Automobile Club of Poughkeepsie.—Otis W. Sherman, Sec.

Huete.—Vittoria, Spain. Mfr. gasoline automobiles.

Huff, Ed.—Watertown, S. D. Garage.

Huff, Russell.—Designer Packard Motor Car Co., Detroit, Mich.

Hughes & Co., Chas. C.—643 Maryland Ave., Washington, D. C. (Elmore.)

Hughes Auto Co.—816 Main St., Cincinnati, O. (Stearns.)

Hughes Co., Wm.—Bough and Dyke Sts., Providence, R. I. (Reo, Premier.)

Hughes, D. W.—1001 Chestnut St., Philadelphia, Pa. (Manhattan.)

Hughes, Geo. H.—Sales Mgr. Humphreys Mfg. Co., 201 E. 5th St., Mansfield, O.

Hughes, John R.—130 Bank St., Waterbury, Conn. (Ford.)

Hughes, S. A.—Kingston, N. Y. (Elmore.)

Hughes, W. B.—Sec. Sports, Ltd., 2049 Broadway, New York City.

Hughes, W. E.—Sec. Army Cycle Mfg. Co., 130-132 Meeting St., Charleston, S. C.

Hughey, Wm. J.—Pres. Chicago Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill.

Hughson & Merton.—426 Golden Gate Ave., 438 Market St., San Francisco, Cal.; 1040 S. Main St., Los Angeles, Cal. Supplies.

Hulhorst, F.—Yutan, Neb. (Waltham.)

Hull, W. H.—Pres. The Spaulding Engine Co., St. Joseph, Mich.

Hulse, H. S.—Circleville, O. (Maxwell.)

Humber & Co.—Copenhagen, Denmark. Mfrs. motorcycles. (Humber motorcycles.)

Humber, Ltd.—Beeston, Nottingham, England, and Coventry, England. Mfrs. gasoline automobiles (Humber cars), motorcycles (Humber motorcycles), tricars (Humber tricars).

Humberset, A.—40 bdv. St. Georges, Geneva, Switzerland. Mfr. bodies.

Humbert, C.—12 rue des Solitaires, Paris, France. Mfr. goggles.

Humboldt, Geo. E.—1246 Argyle Ave., Chicago, Ill. Garage.

Hume Carriage Co.—Amesbury, Mass. Mfrs. wood and metallic bodies, automobile covers, foot rests, robe rails, automobile seats, automobile tops.

Hump Motor Garage.—2532-34 N. Broad St., Philadelphia, Pa. Garage.

Humpage, F. R.—Pur. Agt. Packard Motor Car Co., Detroit, Mich.

Humphreys, J.—4038 Payne Ave.,

Cleveland, O. Mfr. tire boots. Est. 1907.

Humphreys Mfg. Co.—201 E. 5th St., Mansfield, O. Mfrs. and jobbers, brass and iron hand and power pumps, sanitary enameled ware, brass castings. Est. 1887. S. N. Ford, Pres.; Reid Carpenter, Sec. and Treas.; D. A. Carpenter, First Vice-Pres.; R. B. Humphreys, Second Vice-Pres.; T. B. McNiece, Supt.; Geo. H. Hughes, Sales Mgr.; A. V. Newman, Pur. Agt.

Humphreys, R. B.—Second Vice-Pres. Humphreys Mfg. Co., 201 E. 5th St., Mansfield, O.

Humphreys, Schloot & Co.—Linton, Ind. (Northern.)



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Humphreys, Henry Lloyd.—Mgr. Automobile Dept. New York Evening Post. B. London, England, April 15, 1871. Ed. public schools and private tutors.

Huneurbein Frères.—102 rue d'Enival, Verviers, Belgium. Mfrs. motorcycles.

Hungerford Brass & Copper Co.—Pearl and Park Sts., New York City. Mfrs. sheet and rod brass and copper; brass and copper metals; bronze metals; copper boiler shells.

Hunt, A. H.—115 Cannon St., London, England. Mfr. primary batteries.

Hunt Automobile Co.—522 7th St., San Diego, Cal. Garage.

Hunt, C. W.—Sec. and Treas. Igniter Appliance Co., 723 Central Ave., Cleveland, O.

Hunt, Hedley & Co.—29 College St., Cannon St., London, England. Mfrs. tire pumps.

Hunter, A. E.—Vice-Pres. Osen Hunter Automobile Co., 407 Golden Gate Ave., San Francisco, and San Jose, Cal. Gen. Mgr. San Francisco Branch.

Hunter, F. S.—Ashland, O. Garage.

Hunter, W. J.—Shop Foreman, Chas Bilz, 1432-38 Count Pl., Denver, Colo.

Hunting.—The variations in the speed of a motor when the governor is not controlling it efficiently; that is to say, when the governor is slowing the engine down and it continues losing speed too long; when the governor is acting in such a way as to increase the speed and the speed continues increasing beyond the proper amount.

Huntington Automobile Co.—Huntington, L. I., N. Y. Mfrs. tire plugs.

Huntington Mfg. Co.—New Rochelle, N. Y. Mfrs. motor boats.

Huntsman Auto Co.—Tucson, Ariz. (Mitchell.)

Huntsville Motor Car Co.—Holmes St., Huntsville, Ala. (Ford.)

Huotari & Co.—Aberdeen, Wash. (Waltham.)

Hurck Motor & Cycle Co.—109 N. 12th St., St. Louis, Mo. (Indian.)

Hurd & Haggin.—316 Hudson St., New York City. Mfrs. marine motors, bearing metals.

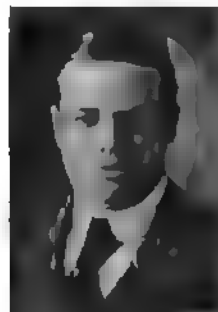


Photo by Spooner & Wells

Hurlbert, William H.—Pres. of the Garford Motor Car Co. of New York and eastern representative of the Garford Motor Car Co., Cleveland, O. Was formerly a successful Detroit dealer and came to New York several years ago to take charge of the Packard New York branch, and was even more successful than in Detroit.

Huron Auto & Elec. Co.—325 E. Water St., Port Huron, Mich. (Northern, Cadillac.)

Hurtu, Compagnie des Automobiles.—29 Ave. de la Grande Armée, Paris, France. Mfrs. gasoline automobiles (Hurtu cars.)

Huss & Co., M. L.—West Buckeye St., Clyde, O. (Reo.)

Huss, Henry, Jr.—48 Valentine St., Mt. Vernon, N. Y. (Maxwell.)

Hussenot et Raynaud.—39 rue la Boétie, Paris, France. Mfrs. lubricators, spark plugs, tire pumps.

Hussey & Co., C. G.—Pittsburg, Pa. Mfrs. brass and copper, sheet and rod.

Hutcheson & Smith.—Hempstead, N. Y. (Ford, Autocar.)

Hutchins, J. H.—Mgr. Magnolia Metal Co., 31 St. Nicholas Ave., Montreal, Canada.

Hutchison Bros. & Co., Ltd.—Rock Bay, Victoria, B. C. (Oldsmobile, Swift.) Est. 1906. Cap. \$40,000. D. C. Hutchison, Gen. Mgr.; Robert Hutchison, Mgr. Elec. Dept. Repairing.

Hutchison, D. C.—Gen. Mgr. Hutchison Bros & Co., Rock Bay, Victoria, B. C.

Hutchinson Electric Horn Co.—1 Madison Ave., New York City. Mfrs. horns.

Hutchison, Robt.—Mgr. Electrical Dept. Hutchison Bros. & Co., Rock Bay, Victoria, B. C.

Hutchinson & Co., W. R.—15 Caledonia Ave., Rochester, N. Y. Mfrs. cloth and carpet trimmings.

Hüttis und Hardebeck.—Aix-la-Chapelle, Germany. Mfrs. gasoline automobiles.

Hutts & Co.—Jacksonville, Fla. (Elmore, Buick, Cadillac.)

Hyam & Co., Ltd.—134 Oxford St., London W., England. Mfrs. ladies' wearing apparel, hats, caps, coats.

Hyatt Roller Bearing Co.—427 Middlesex St., Harrison, N. J. Mfrs. roller bearings, transmission gears.

Hybarger, E. M.—Prop. and Mgr. Progressive Mfg. Co., 12 S. Poplar St., Pana, Ill.

Hyde, Arthur S.—Sec. Treas. and Gen. Mgr. The Whitlock Coil Pipe Co., Elmwood St., Hartford, Conn.

Hyde Park Garage.—5208 Lake Ave., Chicago, Ill. Garage.

Hyde, Wesley W.—Treas. Holson Motor Patents Co., Ltd., Pythian Temple, and Couplegear Freight Wheel Co., Ashton Bldg., Grand Rapids, Mich.

Hydra, Société Electrique.—60 bvd. de Clichy, Paris, France. Mfrs. spark plugs, electric lamps.

Hydraulic Oil Storage Co.—820 Penobscot Bldg., Detroit, Mich. Mfrs. systems for storing and handling gasoline and oils, oil burners. Cap., \$20,000. Est. Oct., 1905. Chas. E. Hilton, Pres.; F. G. Farr, Vice-Pres.; Geo. H. Paine, Sec. and Treas.; G. H. Paine and F. G. Farr, Mgrs.

Hydraulic Pressed Steel Co.—E. 61st St., Cleveland, O. Mfrs. pressed steel frames, bicycle sprockets, automobile stampings. Mem. M. & A. M. Cap., \$150,000. Est. August, 1906. A. W. Ellenberger, Pres.; James H. Foster, Vice-Pres. and Gen. Mgr.; H. F. Pettee, Sec. and Treas.; Roger B. McMullen, Sales Mgr.

Hydraulics.—The science dealing with liquids in motion, in connection with their useful application, as distinguished from hydrodynamics.

Hydrocarbon Motor.—The same as Gas-motor.

Hydrocarbons.—Organic compounds formed by the combination of carbon and hydrogen. They are usually classified: 1. As hydrocarbons of the fat series, comprising (A) the saturated or paraffinic hydrocarbons (generators of petroleum); (B) the ethylenic hydrocarbons; (C) the acetylene hydrocarbons (acetylene) 2. As hydrocarbons of the aromatic series, comprising benzene, toluene, naphthalene, etc. 3. As hydrocarbons of the terpene series, comprising spirit of turpentine, india rubber, gutta percha, etc.

Hydrochloric Acid.—See Acid, Hydrochloric.

Hydrogen.—A colorless, odorless gas. It is the unit of the atomic theory, and the lightest of known gases. It is a conductor of heat and electricity; and is uni-

versally diffused in nature in combination with oxygen in the form of hydrogen-monoxide (H_2O) or water. A mixture of hydrogen with oxygen in the proportion of 2 volumes of the first to 1 of the second constitutes a compound which, with a minimum of weight, is capable of disengaging by ignition a maximum of energy. Of such reaction advantage is taken in internal combustion motors, which utilize the vapors of hydrogen associated with carbon (hydrocarburet) for mixing with oxygen diluted with nitrogen derived from the atmospheric air. Hydrogen is used in filling balloons and air-ships, and in the oxy-hydrogen flame.

Hydrolithe.—An industrial hydride of calcium, which, when treated with water, gives off hydrogen available for inflating balloons.

Hydrometer.—An apparatus for measuring the specific gravity of liquids.



There are two kinds, viz.: hydrometers of constant volume and variable weight, such as those of Fahrenheit and Nicholson, and hydrometers of constant weight and variable volume, such as those of Baumé, Gay Lussac, Cartier, etc. Those of the last class are the only ones in common use. The figure represents a hydrometer for testing gasoline. The liquid to be tried is placed in a test-glass, and the instrument floated in it. The denser the liquid, the higher the hydrometer will float, and the

less dense, the deeper it will sink. When the instrument comes to rest, the mark on the stem at the fluid-level may be read off.

Hydrodynamics.—The purely theoretical science dealing with the motions of fluids.

Hydroplane.—See Boat, Hydroplane.

Hydrostatics.—The science that deals with the forces exerted by or on fluids at rest.

Hydro-Palm Soap Co.—22 Minot St., Naponset, Boston, Mass. Mfrs. automobile soap. A. C. Wallis, Mgr.

Hylton, Geo.—182½ Bedford Ave., Brooklyn, N. Y. Garage.

Hymes, Herbert.—Volga, S. D. (Ram-bler.)

Hyslop Bros.—209 Yonge St., Toronto, Canada. (Cadillac, Humber, Beeston.)

Hysteresis.—A term used by Prof. Ewing to denote the general phenomena which arise from the tendency of iron to persist in its magnetic state.

I

I.—Symbol for "intensity of magnetism," also for "moment of inertia."

i. h. p.—Abbreviation of "indicated horse power."

Ir.—Symbol for "iridium."

Iams Automobile Co.—5986 Center Ave., Pittsburg, Pa. (Royal.)

Idaho Auto & Electric Trans. Co.—Room 306, Bank & Ins. Bldg., Dubuque, Ia. (Rapid.)

Ideal Auto Garage.—862 Jefferson Ave., Brooklyn, N. Y. Garage.

Ideal Carriage Washer Co.—383 Main St. E., Rochester, N. Y. Mfrs. carriage and automobile washers. Not inc. Cap. \$5,000. Est. Sept. 1, 1905. E. P. Gaylord, Prop.; H. B. Gaylord, Advt. Mgr.

Ideal Machine & Auto Co.—19 S. 9th St., Lebanon, Pa. (Cadillac, Franklin.)

Ideal Mfg. Co.—Portsmouth, O. Manufacturers of motor trucks, delivery wagons, gas engines, stationary, marine and automobile type. Cap. \$100,000. Est. January, 1907. Chris. Heer, Pres. and Gen. Mgr.; W. R. Fee, Vice-Pres.; H. W. Müller, Sec. and Treas.; Orr May, Purch. Agt.; R. A. Oaks, Supt.

Ideal Manufacturing Co.—Detroit, Mich. Mfrs. brass pipe fittings.

Ideal Plating Co.—3 Appleton St., Boston, Mass. Brass and nickel plating.

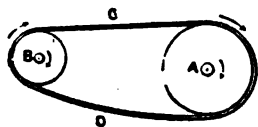
Idium Metals Co.—Boston, Mass. Mfrs. sparking points.

Idle.—In a machine, a part that moves without doing any useful work.

Idle-coil.—See Coil, Idle.

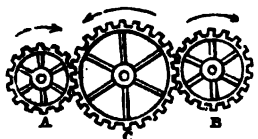
Idle-pulley.—See Pulley.

Idle-side.—Of a driving belt, the loose



or slack side, D (see figure), as opposed to tight or driving side, C.

Idler.—A wheel, C (see figure) in a train of gears which rides loose on its

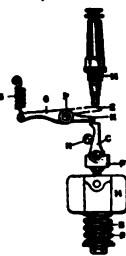


shaft and does not affect the ratio of the velocities of the other wheels (A, B) in the train.



Igniter.—A metallic contact-piece, called also an "anvil," somewhat resembling a spark-plug (see figure), and which is screwed through the cylinder-walls of a motor and forms the stationary electrode in the make-and-break system of ignition. (2) A name also for the complete firing device in the same system.

The figure represents the Brasier igniter, in which the method of breaking contact is very ingenious. Here, B is the tappet rod; C, the trip or actuating lifter; D the spindle of the rocking-lever;



E, the hammer forming part of the rocking-lever inside the cylinder; F, the tappet-rod head on which the trip, C, swivels; G, the arm of the striker to which the spring, S, is attached; H, the guide for the tappet-rod, B; K, the end of the striker upon which the spring acts; M, the anvil; N, the guide-roller which takes C out of engagement with K; R, the spring that returns the tappet-rod to position in contact with the cam on the half-time shaft; S, the spring attached to G, which sharply takes E out of contact with the anvil, M, when C is out of engagement with the hammer, K. It will be seen that as C is pushed upward, the roller N acts upon its inclined face and thus forces C to the right until it slips off the sharp edge at K, when the spring, S, forces E and M apart and thus causes a spark gap. See Ignition.

Igniter, Compression.—A device through which the pressure of compression of a motor is utilized for effecting electric ignition. The igniter (see figure) is simply screwed into the motor-cylinder through any proper opening and operates as follows: When the compression acts upon the piston sufficiently, the latter rises and comes into contact with a pawl inserted in the rocker-arm at the top of the device. Consequently the arm is raised and this re-



leases a movable electrode, which is then forced by a spring to come into contact with the stationary electrode or point. As the rocker-arm continues upward the pawl rides off the piston and a spring just below it returns it instantly to normal position. As the rocker-arm drops, it engages the movable electrode, quickly separates the igniter points and ignites the charge. The igniter piston remains up until after the "explosion" and until the pressure in the cylinder decreases to such a point that the spring above the piston can bring it down to the first position.

With this system there are no moving parts in the ignition mechanism outside of the device itself. This gives it many of the advantages of the jump-spark without the disadvantages of the make-and-break.

Ignition.—In the development of the internal combustion motor many methods of firing the "mixture" have been employed, the oldest of which (the Barnett) is "flame ignition." In this an igniting jet of gas burned within a shell or casing which rotated like a valve and



Fig. 1.

presented an opening in the shell alternately to the explosive mixture in the cylinder and the igniting jet which burned outside of it. In the earlier forms of the Otto motor the firing of the charge was effected by what has been termed "slide-valve ignition." In this method a port, C (Fig. 1), in a peculiarly constructed slide-valve, filled with "mixture" when opposite the charging port, A, and igniting it from a constantly burning gas-jet, D, transferred flame to the igniting port, B. In the Brayton motor the igniting flame was kept burning continuously within the cylinder itself. Another system termed "hot metal ignition," avoided bringing a flame or jet into the cylinder, but fired the mixture by introducing into it a heated metal surface through a slide-valve. Flame ignition, which is now obsolete, was followed by "hot-tube ignition," or

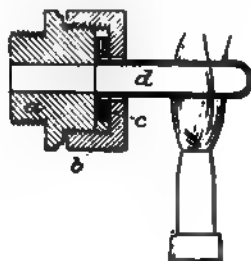


Fig. 2.

"lamp ignition." In this method, which originated with Daimler, a tube of platinum or porcelain, with the outer end closed (Fig. 2), was secured by an asbestos-packed nut, C, to a coupling, A, screwed into the wall of the cylinder and connected with the compression space. This tube was maintained at a red heat by a Bunsen burner or similar device on the exterior. A part of the charge was forced into the tube by the compression stroke and ignited by the intense heat of the outer closed end. With some engines using hot-tube ignition, the connection with the cylinder is controlled by a slide-valve, which opens and admits the compressed mixture into the hot tube at the proper point of the cycle. With others there is no valve at all, the compression alone forcing the mixture into the tube. Such an arrangement, however, is liable to cause premature ignition under certain conditions, and is inferior to a device for timing the moment of ignition. With a number of gas-motors a "timing valve," operated from the cam-shaft, has therefore been employed. As shown in Fig. 3, the lever, A, attached to the push-rod, B, is raised, thus pulling out the rod, C, by action of the arm, D, and opening the port, E, leading into the cylinder space, F. The compressed gases in the cylinder are then admitted into the hot tube, G, surrounded by a gas-flame, and the process of ignition begins, spreading from the gas within the tube into the combustion-chamber of the cylinder. The time of ignition may be varied by adjusting the throw of the cam, so as to bring the opening of the valve, E, to any desired point. Another method

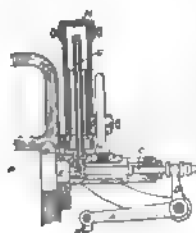


Fig. 3.

called "catalytic ignition," takes advantage of the catalytic action of spongy platinum, the impact of a jet of combustible gas upon which so raises its temperature that it acts as an igniter. This method has the objection that with a mixture of varying richness the ignition is neither positive nor reliable. In another method, "incandescent wire ignition," a coil of platinum wire, rendered incandescent by an electric current, is carried on a slide, from which it is insulated, and introduced white-hot into the explosive mixture. "Ignition by compression," in which the explosive charge is compressed to such a degree as to cause it to heat and ignite spontaneously has been used in some stationary engines; but the objection to the system is its

uncertainty with low and variable compressions and widely varying loads. Another method of firing the charge is that called "hot-head ignition." In this a closed chamber is connected by a narrow passage with the rear end of the cylinder, and into this extends a vaporizing-nozzle connected with the fuel supply. On starting the motor the chamber is heated by a suitable torch. On the suction-stroke a spray of oil is forced through the nozzle into the hot chamber. The return-stroke compresses the air in the cylinder clearance to a very high degree and forces a certain portion through the narrow passage, and ignition at once begins. Although some very effective types of gasolene motors still use the hot-tube ignition method, the majority employ electric ignition, of which there are two systems, viz., the primary, or "make-and-break spark," called also "touch-spark," "wipe-spark," "kiss-spark," "snap-spark," "contact" and "hammer-spark," and the secondary or "jump-spark." Both of these systems must have some separate source of electric energy, such as a battery of galvanic cells, a small dynamo, or a magneto-generator, a coil, a device for making and breaking the circuit, and an igniter or spark-plug as the case may be. The spark-coil acts as a reservoir, as it were, to store up the energy of the current when it is made, and to discharge it when it is broken; and such discharge between two points, within the compression space, forms the spark that ignites the charge. In the make-and-break system the circuit is made and broken within the compression space, a fact which gives the system its name.

The make-and-break device, of which there are many forms, consists of two electrodes, one of them stationary and the other movable. The stationary electrode (Fig. 4) called an "anvil" and sometimes an "igniter," although the latter term is applied also to the entire ignition device, somewhat resembles a spark-plug and is screwed through the walls of the cylinder and insulated from the other parts of the motor.



Fig. 4.

The movable electrode, which is not insulated from the motor, has the form of a lever, one arm of which, inside the cylinder, is normally in contact with the insulated plug or anvil. At the proper moment the mechanism of the motor causes the contact-arm to be separated by a blow, as from a hammer, from the surface of the insulated anvil against which it rests. This has caused the method of ignition under consideration to be sometimes known as the "hammer-break" system.

The spark-coil for primary or make-and-break ignition consists of a bundle of soft iron wire around which is wound a quantity of insulated copper wire. The current from this coil is a primary or low tension one, and this is why the make-and-break ignition is called also primary ignition. For the secondary or "jump spark" system the spark-coil receives another winding of several thousand feet of fine insulated wire called a "secondary winding." This makes a jump-spark or high-tension coil. The electric circuit for this system of ignition is interrupted at any convenient point on the motor and causes a spark to jump between two points carried by a spark-plug screwed into an opening in the combustion-chamber. For jump-spark ignition, see Coil, Induction.

Ignition, Advance.—See Spark-advance.

Ignition, Arc.—See Ignition.

Ignition-cam.—See Cam, Ignition.

Ignition, Catalytic.—See Ignition.

Ignition, Compression.—See Ignition.

Ignition, Electric.—See Ignition.

Ignition, Flame.—See Ignition.

Ignition, Hot-head.—See Ignition.

Ignition, Hot-tube.—See Ignition.

Ignition, Lamp.—See Ignition.

Ignition, Jump-spark.—See Coil, Induction.

Ignition, Lead of.—See Lead, Ignition.

Ignition-lever.—A lever for advancing and retarding the spark.

Ignition, Make-and-break.—See Ignition.

Ignition-plug.—The same as spark-plug.

Ignition, Pre- or Premature.—The same as back-fire, q. v.

Ignition, Self.—The ignition of the charge of an internal combustion motor through contact with an overheated portion of the cylinder-wall or with a heated deposit of soot in the combustion-space.

Ignition, Slide-valve.—See Ignition.

Ignition, Tube.—See Ignition.

Ignition-valve.—See Valve, Ignition.

Igniter Appliance Co.—723 Central Ave., Cleveland, O. Mfrs. spark plugs and ignition devices. Mem. M. & A. M. Est. 1906. W. C. Hine, Pres.; C. W. Hunt, Sec. and Treas.

Ilg, Walter.—Sales and Advt. Mgr. Schacht Mfg. Co., 2727-31 Spring Grove Ave., Cincinnati, O.

Illinois Auto & Parts Co.—Globe and Main Sts., Peoria, Ill. Mfrs. gasolene automobile motors, timers.

Illinois Auto Mfg. & Garage Co.—Springfield, Ill. Garage.

Illinois Automobile Association.—1117 Monadnock Bldg., Chicago, Ill. Organized in 1905 "to unite the effort among clubs of the State for the common good." Members: Chicago A. C., Springfield A. C., Kankakee A. C., A. C. of Mattoon.

Decatur A. C., McHenry County A. C., Peoria A. C., Rockford A. C., Bloomington A. C., Austin A. C. and Chicago Motor Club. Present officers, L. E. Myers, Pres.; S. P. Irwin, G. W. Ehrhart, R. M. Baker, Vice-Pres.; John Farson, Treas.; W. H. B. Weston, Sec.; Ira M. Cobe, Jno. Farson, L. E. Myers, S. S. Gorham, R. M. Baker, G. W. Ehrhart, S. P. Irwin, H. A. Olson, J. H. Francis, R. M. Whitney and B. C. Hamilton, Directors. Directed campaign which resulted in new Illinois State Motor Vehicle laws. Sidney S. Gorham, former Pres.

Illinois Garage Mfg. Co.—Water and Mill Sts., Pontiac, Mich. (Reo.) Repairing.

Illinois Malleable Iron Co.—Chicago, Ill. Mfrs. malleable iron castings, pipe, fittings.

Illinois Motor Works.—719-23 Sheffield Ave., Chicago, Ill. Mfrs. motorcycles.

Illinois Steel Co.—203 Ellicott Sq., Buffalo, N. Y. Mfrs. steel.

Ilisley, Inc., Frank P.—1329 Michigan Ave., Chicago, Ill. (Stevens-Duryea.)

Illustrierte Aeronautische Mitteilun-gen.—Munsterplatz 9, Strasburg, Germany. (Aeronautical magazine.)

Impedance.—The apparent resistance of a circuit or part of a circuit when traversed by an alternating or variable current; that is, the ratio of the impressed e. m. f. to the current.

Imperial Auto Station.—52 W. 67th St., New York City. Garage.

Imperial Brass Mfg. Co.—245-247 S. Jefferson St., Chicago, Ill. Mfrs. tire pumps, water pumps, air pumps, oil pumps, pressure regulators, auxiliary tanks, railing, handles, lamp brackets, hub caps, name plates, priming cups, gasoline cocks, pipe connections, brass work to order. Cap., \$35,000. Est. 1905. Charles McNellis, Pres. and Treas.; Frank McNellis, Vice-Pres.; William S. Noyes, Sec.

Imperial Garage.—664 Halsey St., Brooklyn, N. Y. (Rambler.)

Imperial Garage Co.—Mound St., Columbus, O. Garage.

Imperial Motor Car Co.—Cor, 3rd and Locust Ave., Williamsport, Pa. Makers of the Imperial roadster, first marketed February, 1907. Two models. Cap. \$50,000. Garrett Corchrane, Pres.; Fred. P. Brand, Vice-Pres., Gen. Mgr., Purch. Agt., Sales and Advt. Mgr.; Henry D. Brown, Treas.; H. H. Bubb, Sec.; Wm. I. Glasby, Supt.

Imperial Motor Co.—1094 Main St., Buffalo, N. Y. (Buick, Packard, Pope-Waverley, Pope-Hartford.) Garage.

Imperial Porcelain Works.—Mulberry St. and New York Ave., Trenton, N. J. Mfrs. porcelain insulators for spark plugs. Est. July, 1891. Frederic A. Duggan and B. B. Dinsmore, Props.

Imperial Steel Co., The.—218 Front St., Fremont, O. Mfrs. steel castings, hubs.

Imperial Tire & Rubber Co., Ltd.—Eagle Wharf Rd., London N., England. Mfrs. pneumatic tires.

Imperial Wheel Co.—Flint, Mich. Mfrs. wood wheels. Selling Agts. The American Distributing Co., Cleveland, O.

Importers' Automobile Salon.—45 W. 42d St., New York City. Organized Aug., 1904, "to further the interests of local importers of automobiles and to promote the importing automobile trade." Charter members, E. T. Birdsall, E. B. Gallaher, E. R. Hollander, C. R. Mabley, J. S. Josephs, F. A. La Roche, E. T. Kimball, S. B. Bowman. Officers: C. W. Wyckoff, Treas.; S. B. Bowman, Sec.; E. R. Hollander, Vice-Pres.; J. S. Josephs, Pres.; Andre Massenat, Chairman Show Committee; Percy Owen, Chairman Trade and Contests Committee. Walter R. Lee, Gen. Mgr. C. R. Mabley was formerly Pres. and Gen. Mgr. In 1905 the Importers' Automobile Salon held in Herald Square Hall the first exclusive importers automobile show in America. Present members: Walter C. Allen, A. M. Archer, Wm. H. Barnard, R. Bertelli, Julien E. Bloch, S. B. Bowman, Maurice Coster, Edward B. Gallaher, E. R. Hollander, J. S. Josephs, Paul La Croix, Egbert Lillie, Carlton R. Mabley, Geo. M. MacWilliam, Walter C. Martin, Andre Massenat, Henry Neubauer, Percy Owen, F. D. Palmer, Gaston R. Rheims, I. Henry Walker, C. F. Wyckoff.

Impulse.—A suddenly applied force; a term applied especially to the force of the heat-expansion ("explosion") in an internal combustion motor.

Inboard.—Situated on the inside of a boat; the reverse of "outboard."

Incandescence.—Glowing, self-illuminous (emitting light), owing to high temperature, as red hot iron, molten iron, etc. The motors in which ignition was effected by a platinum tube maintained at a red heat were said to be "fired by incandescence."

Incerti E. Co., R.—Villar Perosa, Pinero, Italy. Mfrs. ball bearings.

Inch-pound.—A unit of work occasionally used; the work done when one pound is raised one inch.

Incrustation.—The same as scale or fur, q. v.

Independent Auto Co.—5989 Center Ave., Pittsburg, Pa. Repairing.

Independent Automobile Co., Ltd.—1016 Common St., New Orleans, La. (Stoddard-Dayton.)

Independent Steel & Wire Co.—House St., Chicago, Ill. Mfrs. machinery springs and seat springs.

Independent Tire & Rubber Co.—Akron, O. Mfrs. pneumatic tires, clincher type. Est. 1906. Inc. Diamond Rubber Co., sole selling agents.

Inderground, W. F.—Sec. New Jersey Automobile Co., 855-7 Springfield Ave., Newark, N. J.

Indestructible Steel Wheel Co.—1303 Michigan Ave., Chicago, Ill. Mfrs. sheet steel, stampings, steel wheels.

Index.—A hand or pointer arranged to move over a dial or scale.

Indiana Auto Co.—220 N. Y. St., Indianapolis, Ind. (Peerless, Winton, Franklin, Autocar, Baker, Pope-Hartford.)

Indiana Automobile Club.—R. A. Brown, Sec., Indianapolis, Ind.

Indiana Brass & Bronze Co.—Marion, Ind. Mfrs. brass, bronze, aluminum and copper castings.

Indiana Electric Co.—724 Philadelphia St., Indiana, Pa. Supplies.

Indianapolis Automobile Racing Assn.—F. M. Hoblitt, Sec., 220 E. N. Y. St., Indianapolis, Ind.

Indianapolis Bolster Spring Co.—326 W. Georgia St., Indianapolis, Ind. Mfrs. shock absorbers.

Indianapolis Buggy Top Co.—2116 S. Meridian St., Indianapolis, Ind. Mfrs. automobile tops.

Indianapolis Dash Co.—Indianapolis, Ind. Mfrs. dashes and fenders, dos-a-dos seats.

Indianapolis Drop Forging Co.—Indianapolis, Ind. Mfrs. automobile drop forgings, drop forged wrenches. Cap., \$85,000. Est. 1896. Walter Kessler, Pres.; Fred Barnickol, Vice-Pres.; P. M. Watson, Sec and Treas.

Indianapolis Foundry Co.—Indianapolis, Ind. Mfrs. gray iron castings.

Indianapolis Motor Co.—111 Kentucky Ave., Indianapolis, Ind. (Dragon, Rapid.)

Indianapolis Motor Car Co.—West Plains, Mo. (Dragon, Logan.)

Indiana Rubber & Insulated Wire Co.—Jonesboro, Ind. Mfrs. insulated wire.

India-rubber.—See rubber.

India Rubber, Gutta Percha & Telegraph Works Co., Ltd.—Persan-Beaumont, Seine-et-Oise, France. Mfrs. pneumatic and solid tires.

India Rubber & Gutta Percha Insulating Co.—253 Broadway, New York City. Mfrs. insulated wire.

India Rubber Review.—Akron, O. Theodore E. Smith, Pub.: monthly.

India Rubber Tire Co.—477 Wabash Ave., Chicago, Ill. Mfrs. bow separators.

India Rubber World.—35 W. 21st St., New York City. India Rubber Pub. Co.; monthly.

Indiana State Automobile Assn.—In-

dianapolis, Ind. H. O. Smith, Pres.; John S. Cox, First Vice-Pres.; Horace Kizer, Second Vice-Pres.; J. A. Speckenhier, Treas.; Edgar Apperson, Kokomo, Ind., Sec. Membership: Automobile Club of Wayne County, Cass County Auto Club, of Logansport; Indiana Automobile Club, South Bend Automobile Club, Terre Haute Automobile Club.

Indicated Horse-power.—See Horse-power, Indicated.

Indicator.—An apparatus for showing the force of the steam in an engine and the state of exhaustion in the cylinder during the stroke.

Indicator-card.—The card on which an indicator diagram is drawn, or the diagram itself.

Indicator-diagram.—A figure showing the pressure in the cylinder at every point of the stroke.

Indicator, Polarity.—See Polarity-indicator.

Indicator, Speed.—Same as tachometer, q. v.

Induced Current.—See Current, Induced.

Inductance.—The co-efficient of induction of a circuit. It is measured in "henrys," equal to 10^9 C. G. S. units of inductance. Inductance and impedance intervene in the calculations of lines designed to carry alternating currents.

Induction.—The production of electricity in a coil or apparatus at a distance from the inducing current, and not connected thereto by conductors. (2) The drawing of the explosive mixture into the motor.

Induction-coil.—See Coil, Induction.

Induction, Magnetic.—The production of magnetic properties in soft wires, etc., when placed in a magnetic field. (2) The magnetic flux density in any material placed in a magnetic field.

Induction, Self.—When a current flows in a circuit, a magnetic field of greater or less strength is always produced, and such field, while appearing or disappearing, necessarily cuts the circuit itself, and in so doing, sets up an induced e. m. f. With steady currents this effect occurs only at its starting or stopping, the result being that the rise of a current is opposed by the self-induced e. m. f. in the opposite direction, and its stoppage also opposed by another self-induced e. m. f. in the same direction, the effects being most conspicuous in the case of coils of wire having iron cores. The result is that an electric current behaves as if it possessed inertia, and is unable to start or stop instantaneously.

Induction-stroke.—The same as suction-stroke."

Induction-valve.—See Inlet-valve.

Inductor.—That part of a dynamo or magneto that furnishes the magnetic field necessary for the operation of the apparatus. In dynamos the inductor is an electro-magnet, and the current that produces the magnetic field in the inductor is called the "exciting current."

In a magneto the inductor is not an electro-magnet, but a permanent artificial magnet.

Industrial Motor Review.—Pub. at 89 Fleet St., London, England.

Industrie Vélocipédique et Automobile.—Pub. at 75 rue Vielle-du-Temple, Paris, France.

Inertia.—The property of matter in virtue of which it cannot of itself change its own state of motion or rest. If a body is at rest it remains so until some force acts upon it, and if it is in motion this motion can be changed only by the application of some force.

Ingalls, C. E.—Prop. Montgomery Auto Transfer, 207 Monred St., Montgomery, Ala.

Ingalls, C. E.—Vice-Pres. Austin Automobile Club, Austin, Ill.

Ingalls Garage Co.—State St., Newburyport, Mass. Supplies; garage; repairs.

Ingate.—The channel, called also "tedge," through which metal is poured into a mould.

Inge, W. M.—Sales Mgr. Loring Speed Gauge Co., 91 Marshall St., Somerville, Mass.

Ingersoll-Rand Co.—11 Broadway, New York City. Mfrs. air compressors, hose couplings.

Ingot.—A mass of metal which has been poured into a mould in order to give it a shape (usually that of a short rectangular bar), convenient for handling.

Initial Condensation.—See Condensation. Initial.

Initial Pressure.—See Pressure, Initial.

Injector.—An apparatus for forcing water into a boiler through the intermedium of a jet of steam.

Inks, W. B.—Ligonier, Ind. (Ford.)

Inland Auto Co.—Spokane and Alder Sts., Walla Walla, Wash. (Franklin, Buick, Thomas, Oldsmobile.)

Inlet-cam.—See Cam, Inlet.

Inlet-pipe.—See Pipe, Inlet.

Inlet-valve.—See Valve, Inlet.

Inner Shoe Tire Co.—64 Monroe St., Grand Rapids, Mich. Mfrs. anti-skid devices, tire cases, tire patches, tire shoes.

Inner Tube.—In a pneumatic tire, an air-tight tube which fits in the outer casing.

Inserts, Cork.—See Cork Inserts.

Inspection-pit.—A pit in the floor of a

garage from which access can be gained to the underside of a motor-car.

Inspection-plate.—The same as hand-hole plate. See Hand-hole.

Insular Auto Co.—San Juan, Porto Rico. (Knox.)

Insulation.—A coating of non-conducting material applied to a wire or other electrical conductor to prevent the escape of the current through contact with external objects.

Insulator.—A substance that is a non-conductor of electricity. The specific resistance of some important materials is as follows: Mica, 8.4x10¹⁷ megohms; glass, 9x10¹⁷ megohms; gutta percha, 4.5x10¹⁸ megohms; shellac, 9x10¹⁸ megohms; ebonite, 2.8x10¹⁸ megohms; paraffine wax, 3.4x10¹⁸ megohms.

Intake.—The same as Inlet-pipe.

Integral.—All of one piece.

Intensifier, Spark.—See Spark-gap.

Interconnected.—In a mechanism, parts that are operatively connected.

Interlock.—The same as "mesh," q. v.

Intermédiaire Automobile, L'.—Pub. at 39 rue d'Isly, Algiers, Algeria.

Internal Gear.—See Gear, Internal.

International Auto Horn Mfg. Co.—151 E. 126th St., New York City. Mfrs. horns and tubings.

International Automobile Co.—101 Burnside Pl., Montreal, Canada. (Dragon, Gale, Wayne.)

International Automobile Co.—Toronto, Canada. (Wayne.)

International Automobile Exchange, The.—250 W. 49th St., New York City. (Second-hand cars.)

International Correspondence School.—Scranton, Pa. Automobile instruction, correspondence.

International Harvester Co.—Akron, O. Mfrs. gasoline automobiles.

International Motor Car Co.—514-16 N. Broad St., Philadelphia, Pa. (Walter, Darracq.)

International Motor Cyclopaedia.—Times Bldg., New York City. Pub. yearly.

International Motor Review, The.—Pub. at 30 rue de Londres, Paris, France.

International Power Vehicle Co.—216 Pacific St., Stamford, Conn. Mfrs. kerosene motors.

International Taxametergesellschaft.—79 Landsbergerstrasse, Berlin, Germany. Mfrs. speed indicators.

Interrupter.—A device for the rapid making and breaking of an electric circuit. The same as trembler, q. v.

Interstate Auto & Supply Co.—Sioux City, Ia. (Premier.)

Interstate Foundry Co.—Cleveland, O. Mfrs. gray iron castings.

Interurban Motor Car Co.—1920

Broadway, Oakland, Cal. (American, Knox.)

Interurban Motor Traction Co.—W. Main St., Lexington, Ky. (Manhattan.)

Invicta, Société.—5 rue Déves, Neuilly, Seine, France. Mfrs. storage batteries, spark plugs, coils, low tension magnetos.

Invincible Tire Armor Co.—Hartley, Ia. Mfrs. tire treads.

Ion.—A term introduced by Faraday to denote current-carriers in electrolysis. "Ions" include "anions" and "cations." The anions go from the anode and the cations from the cathode.

Iowa Auto & Supply Co.—407 4th St., Des Moines, Ia. (White.)

Iowa Auto Co.—Ottumwa, Ia. (Ford.) Est. 1903. E. H. Emery, Mgr.; B. P. Brown, Sec. and Treas.

Iowa Automobile Club.—W. B. McNutt, Sec., Des Moines, Ia.

Iowa Brass & Novelty Works.—717 Grand Ave., Des Moines, Ia. Garage.

Iowa Marine Engine & Launch Works.—Bellevue, Ia. Mfrs. motor boats.

Iowa Vulcanizing & Tire Co.—408 Main St., Davenport, Ia. (Pope-Hartford, Pope-Toledo, Babcock.) Est. 1906. J. L. Herbert, Mgr. Garage, 30 cars; repairing.

Irby, R. V.—Laurence, S. C. (Maxwell.)

Ireland, D. M.—Pres. Edmunds & Jones Mfg. Co., 315 Riopelle St., Detroit, Mich.

Iridium.—A shining white metal, and next to osmium, the heaviest known element. It occurs naturally along with platinum, to which it is allied. The standard metre is an alloy of 10 per cent. iridium and 90 per cent. platinum. Iridium and iridio-platinum alloy, because of their resistance to wear and corrosion, are used for making make-and-break and trembler terminals, and the electrodes of spark-plugs.

Iron.—The most important of all metals, but of exceedingly rare occurrence in a metallic state. Pure iron has a white color and perfect luster. It is extremely soft and tough, and has a specific gravity of 7.8. In good bar iron or wire a distinct fibrous texture may always be observed when the metal has been attacked by an acid, and upon the perfection of such fiber much of its strength and value depends. Iron is the most tenacious of all the metals, a wire 1-36 of an inch bearing a weight of 60 pounds. It is very difficult of fusion, and before becoming liquid passes through a soft or pasty state. Iron is extracted from its ores in a blast-furnace, the product of which is crude or cast-iron, of which there are several varieties, distinguished by differences of

color, hardness and composition and known by the names of "gray," "black," and "white" iron. Gray pig-iron is used for castings, and white in making steel. The black and gray kinds probably contain a mechanical mixture of graphite. "Wrought" iron is the purest form of useful iron, and is usually made from gray iron by a process called "puddling," previous to which it commonly undergoes a process called "refining." This "refined" product is cast into "bar" iron. To make the best iron, the bar is cut into pieces and submitted to a process called "fagoting" (see Fagot). Iron containing but 0.005 to 0.015 per cent. of carbon gives steel. The properties of iron are also much modified by other simple bodies, thus: Silicon will harden iron and make it brittle, but in the presence of carbon, by inducing the carbon to take the graphitic instead of the combined form, it leaves the iron softer and coarser in grain. Sulphur has a strong, steady effect on the iron. It closes the grain, hardens the cold metal, makes it red short and causes it to run thick and pasty when melted. The effect of phosphorus is to make the metal cold short. It seems to have but little effect on the breaking strain, if the load be gradually applied, but renders it susceptible to shocks. Manganese closes the grain of iron. It fluxes out the disseminated oxides and, in moderate percentages, tends to produce sound, tough castings. In the higher percentages it removes the sulphur, but is likely to increase the hardness so as to render the iron unmanageable. Carbon exists in iron in two conditions, combined and graphitic. The combined hardens the iron and the graphitic softens it, giving crystalline formation on fracture. A proper ratio of these elements may be made to influence the iron so as to turn out almost any type of metal desired.



Iron, Angle.—A bar of wrought iron, the cross-section of which has the form of the letter L (see figure).

Iron-cement.—See Joint. Rust.

Iron, Channel.—A form of angle-iron having a web and two flanges extending on one side only of the web.

Iron, Charcoal.—Iron prepared in a furnace in which charcoal is the sole fuel. It is the finest and purest variety of iron, and of great value for electrical work, such as transformer cores, armature disks, etc.

Iron, Circle.—See Fifth Wheel.

Iron, Dumb.—The forward ends of the sills of a motor-car frame to which the forward ends of the springs are attached. See Spring-horn.

Iron, Galvanized.—Sheet iron coated with zinc to prevent oxidation. The process is not electrical as the name implies, but consists simply in dipping the iron into molten zinc.

Iron, I.—A bar of iron with a cross-section like the letter I.

Iron, Meteoric.—See Steel, Nickel.

Iron-plate.—Iron rolled into the form of plates.

Iron, Refined.—White cast-iron which has been partially deprived of its carbon previous to the process of puddling. See Puddling.

Iron-rust.—See Rust.

Iron, Sheet.—Iron in the form of thin plates, usually formed by rolling or hammering.

Iron, Soldering.—See Soldering-iron.

Iron, T.—A bar of iron of which the cross-section has the form of the letter T.

Iron, Wrought.—Pure iron containing from 99.6 to 99.8 per cent. of the metal. It has the highest melting point of any of the useful forms of iron, is soft and fibrous, and strongly magnetic. It cannot be hardened or tempered, is easily welded, and is malleable and ductile.

Iron Age, The.—14 Park Pl., New York City. David Williams Co., Pubs.; weekly.

Iron City Auto Co.—613 5th Ave., Pittsburg, Pa. Garage.

Iron Clad Mfg. Co.—204 Varet St., Brooklyn, N. Y. Mfrs. tanks, storage tanks, enameled ware.

Iron Moulders' Journal.—Cincinnati, O. International Moulders' Union of N. A., Pub.; monthly.

Iroquois Motor Car Co.—Seneca Falls, N. Y. (Iroquois.)

Iroquois Rubber Co., The.—478-483 Washington St., Buffalo, N. Y. (Morgan & Wright tires.)

Irreversible.—A term applied to a steering-gear in which the steering-device moves the road-wheels, but cannot be moved by them.

Irvin Machine Works.—335 Golden Gate Ave., San Francisco, Cal. Repairing.

Irvin, Richard.—Treas Maxwell-Briscoe-Chase Co., 1407-9 Michigan Ave., Chicago, Ill., and Treas. Maxwell-Briscoe Motor Co., Tarrytown, N. Y.

Irvin & Co., Richard.—25 Broad St., New York City. (Maxwell.)

Irving Auto Station.—128 E. 29th St., New York City. Garage.

Irwin, Robert C.—Head of Repair

Dept., C. P. Kimball & Co., 315-318 Michigan Ave., Chicago, Ill.

Isbell, J. J.—113 N. Mitchell St., Kendallville, Ind. (Auburn.)

Isbell & Co., Wm. G.—1413 Michigan Ave., Chicago, Ill. (Simplex.) Est. May 3, 1907. Not inc. John S. Gorham, E. E., electric vehicle expert.

Iseminger, Floid G.—311 E. Front St., Bloomington, Ill., and Normal, Ill. (Ford, Mitchell.)

Isham Co.—Norwich, Conn. Mfrs. motor boats.

Isnard.—36 Ave d'Alsace-Lorraine, Grenoble, France. Mfrs. automatic starters.

Isochronous.—A word meaning "what is done in equal times." With motors it is synonymous with the term "balanced."

Isotta-Fraschini, Societa Anonima.—79 Monte Rosa, Milan, Italy. Mfrs. gasoline automobiles. (Isotta-Fraschini.) Automobile motors.

Isotta Import Co., The.—1620-24 Broadway, New York City. (Isotta-Fraschini.) C. M. Hamilton, Prop.

Israel, Abe.—139 Broadway, Paterson, N. J. Garage.

Itala Import Co.—41 W. 65th St., New York City. (Itala.)

Itala, Societa Anonima Fabbrica di Automobili.—29 via Petrarco, Turin, Italy. Mfrs. gasoline automobiles. (Itala cars.)

Ithaca Carriage Co.—Ithaca, N. Y. Mfrs. automobile seats.

"It" Locknut Concern.—515 E. 63d St., Chicago, Ill. Mfrs. locknuts and washers.

Ivel Agricultural Motors, Ltd.—45 Great Marlborough St., London, England. Mfrs. agricultural implements, tractors, harvesters, lawn movers, automobile motors.

Iverson & Co., J. C.—425 Water St., Milwaukee, Wis. Mfrs. gasoline automobiles.

Ivery Realty Co.—Montgomery, Ala. Garage.

Ivins, Ellwood.—Prop. Ellwood Ivins Tube Works, Oak Lane Station, Philadelphia, Pa.

Ivins Tube Works, Ellwood.—Oak Lane Station, Philadelphia, Pa. Mfrs. seamless steel, brass, copper and aluminum tubing. Est. 1876. Ellwood Ivins, Prop.; Lewis Boyd, Supt.; Frank Clark, Asst. Supt.

Ivry Car & Motor Works.—15 Victoria St., Westminster, London, England. Mfrs. tricar. (Ivry.)

J

J.—Abbreviation of "joule."

J.—Symbol of "intensity of magnetization."

Jack.—A lever jack, called also a "lifting jack" (of which there are various forms), designed to lift an axle so as to raise the wheel in order that it or its tire may be removed or repairs be made. (2) A spring-clip called also "spring-jack" or "knife-jack," by which a connection may be readily made in electric circuits.



Jack-in-the-Box Gear.—See Gear, Differential.

Jack-shaft.—The same as Counter-shaft. See Shaft, Counter.

Jacket, Steam.—A hollow casing around the cylinder of a steam-engine, and which, kept supplied with hot steam, maintains the temperature of the cylinder.

Jacket, Water.—A casing around the cylinder of a gas-motor, forming a chamber for carrying water for cooling purposes. The jacket is usually cast integral with the cylinder, and is sometimes galvanized and sometimes coated with an electrolytic deposit of copper to prevent oxidation. Some motors, on the contrary, have attached water-jackets of plain or corrugated copper or of brass, which, although they permit of a somewhat simpler cylinder casting and of a saving in weight, have the disadvantage of being liable to leak. See Cylinder Cooling.

Jack, M. L.—Rochester, Pa. (Rambler.)

Jacks, E. D.—Napa, Cal. (Thomas, Winton, Oldsmobile, Royal, Buick.)

Jackson.—104 rue Oberkampf, Paris. France. Mfr. horns.

Jackson, A. F.—Vice-Pres., Treas. and Gen. Mgr. The Semi-Dry Battery Co., cor. 5th and Essex Sts., Harrison, N. J.

Jackson Agency.—Des Moines, Ia. (Jackson.)

Jackson, A. J.—Proprietor and Mgr. Auto Specialty Co., 6 E. Madison St., Chicago, Ill.

Jackson Automobile Co.—South Park Ave., Jackson, Mich. Makers of the Jackson car; first marketed in 1900. Five models made since. Cap. \$24,000. Chas. Lewis, Pres.; G. A. Mathews, Sec.

Treas. and Purch. Agt.; F. L. Holmes, Gen. Mgr.; C. Bird, Supt.; Chas. Van Horne, Advt. Mgr. Agents and dealers: Arlington Motor Car Co., 5969 Center Ave., Pittsburg, Pa. Armory Garage, Franklin St., Lynn, Mass. Auto Cycle Equipment Co., Michigan City, Ind. Auto Exchange, 501 Milwaukee Ave., Milwaukee, Wis. Automobile Exchange, The, Salt Lake City, Utah. Auto Transit & Repair Co., 323 N. Court St., Canton, O. Bell, A. W., Stamford, Conn. Benz, Walter G., 246-50 Third Ave., S., Minneapolis, Minn. Berks Auto & Garage Co., 31 S. 5th St., Reading, Pa. Blake Co., E. P., 15-21 Hawkins St., Boston, Mass. Boswell & Co., Wilkes-Barre, Pa. Brockton Auto Exchange, Brockton, Mass. Brunell Auto Co., 38 Exchange Pl., Worcester, Mass. Chase, J. M., Enfield, N. H. Copeland & Taylor, Pontiac, Ill. Clark, C. D., Torrington, Conn. Dayton Automobile Co., 11 W. 4th St., Dayton, O. Dean Bros., 160 N. Broad St., Grand Rapids, Mich. Eidam, C. H., Lawrence, Mass. Essex Automobile Co., 518 Broad St., Newark, N. J. Fair Bros., 1908 Seventh Ave., Beaver Falls, Pa. Fenner, F. H., Bay City and Marquette, Mich. Foley & Smith, Greensburg, Ind. Ford, W. H. 1227 N. Washington Ave., Scranton, Pa. Gates, Chas. S., Belkows Falls, Vt. Griswold, A. H., Garden City, Kan. Gump, A. W. Auto Co., 1118 S. Main St., Los Angeles, Cal. Hannan, Geo. E., 1441 Welton St., Denver, Col. Holmes & Co., M. A., 420 Michigan Ave., Lansing, Mich. Jackson Agency, Des Moines, Ia. Jackson Motor Car Co., 103 Court St., Brooklyn, N. Y. Jackson Motor Co., 1413 McGee St., Kansas City, Mo. Kemp, E. A., Greenville, Mich. King, G. Russell, Easton, Pa. Kitts & Son, E. A., Corning, N. Y. Landis, Samuel K., Lancaster, Pa. Leonard Motor Car Co., Cleveland, O. Lima Automobile Co., Lima, O. Linton, Carroll M., 173 N. Bend St., Pawtucket, R. I. Lockwood Bros., Jackson, Mich. Lubbock Motor Car Co., Lubbock, Tex. Manley Bros., Brattleboro, Vt. Mentel's Automobile Agency, Springfield, O. Miller, Sol., Newport News, Va. Motor Vehicle Co., Harrisburg, Pa. Noyes, Harry G., Berlin and Gorham, N. H. National Motor Car Co., Oakland, Cal. Oathout, Chas. W., 160 Broad St., Newark, N. J. Ohn-

haus Auto Co., Fort Wayne, Ind. Oliver & Kemp, Pontiac, Mich. Patterson Vehicle Co., Paterson, N. J. Perkins, F. H., White River Junction, Vt. Proctor, E. O., Ayer, Mass. Pullman Motor Car Co., S. Portland, Me. Putnam Garage Co., Putnam, Conn. Rarig Auto & Garage Co., Oakland, Cal. Rising, C. E., Rockland, Me. Roberts & Co., O. G., Columbus, O. Rosenblatt, J. M., Greensboro, N. C. Schmitt Bros., Dowagiac, Mich. Seidler Miner Auto Co., 244 Jefferson Ave., Detroit, Mich. Shaffer Mfg. Co., 408 N. Calvert St., Baltimore, Md. Sioux Falls Auto & Supply Co., Sioux Fall, S. Dak. Spencer Motor Co., 316 N. Broad St., Philadelphia, Pa. Sterling Motor Co., Binghamton, N. Y. Temple Auto Co., Ralph, 1219-21 Michigan Ave., Chicago, Ill. Tippecanoe Auto Co., Lafayette, Ind. Treat & Clark, Bangor, Me. Vaughn, D. W., 619 Main St., Richmond, Va. Wabash Auto & Elec. Co., Terre Haute, Ind. Washington Auto Co., Tacoma, Wash. Whitney, R. S., Brunswick, Me. Wilson, Sam J., Eau Claire, Wis. Worthing, G. W., Auto Co., Fond-du-Lac, Wis.

Jackson Body Co.—Jackson, Mich. Mfrs. wood and metallic bodies.

Jackson, C. A.—Lebanon, N. H. (Maxwell.)

Jackson Electric Supply Co.—225 W. 2d St., Muscatine, Ia. (Rambler, Maxwell.)

Jackson, E. M.—Sales and Advt. Mgr., Miami Cycle & Mfr. Co., Grand Ave., Middletown, O.

Jackson, Dr. H. Nelson.—A Burlington, Vt., motorist who was the first to



drive a car across the American continent. Starting from San Francisco May 23, 1903, in a Winton two-cylinder car, Dr. Jackson, accompanied by Sewall K. Crocker, of Tacoma, as chauffeur, he reached New York July 26. He passed

through Sacramento, into Oregon, through Idaho and Wyoming, to Cheyenne, from which point the Union Pacific R. R. was followed to Omaha, Chicago, Cleveland and Buffalo.

Jackson, Julius.—Pres. Gearless Transmission Co., Rochester, N. Y.

Jackson, L. B.—Sec. The Semi-Dry Battery Co., cor. 5th and Essex Sts., Harrison, N. J.

Jackson Machine Works.—Traverse City, Mich. Mfrs. gasoline marine motors.

Jackson Mfg. Co.—614 7th St., Denver, Colo. Mfrs. battery boxes.

Jackson Motor Car Co.—103 Court St., Brooklyn, N. Y. (Jackson.) Est. 1906. Cap., \$20,000. C. M. Herring, Pres.; Henry W. Palmer, Sec. and Treas. Garage, 15 cars; repairing.

Jackson Park Auto Garage.—6430 Jackson Park, Chicago, Ill. Garage.

Jackson, R. B.—Pur. Agt. Olds Motor Works, Lansing, Mich.

Jackson, R. B.—Gen. Mgr. E. R. Thomas Motor Co., 1200 Niagara St., Buffalo, N. Y.

Jackson Resilient Hub Syndicate.—32 Victoria St., Westminster, London, England. Mfrs. elastic wheels.

Jackson Tire Filling & Refilling Co.—190 W. Jackson Blvd., Chicago, Ill. Mfrs. tire fluid.

Jacksonville Automobile & Motor Club.—Herbert P. Race, Sec., Jacksonville, Fla.

Jaco, E. L.—Sec. Houghton Implement Co.—201-225 N. 9th St., Grand Forks, N. D.

Jacob F.—89 rue Arago, Puteaux, France. Mfr. leather tires.

Jacob, Michel.—8 Bvd. Voltaire, Paris, France. Mfr. oil lamps, acetylene lamps and horns.

Jacob, R.—City Island, N. Y. Mfr. Motor-boats.

Jacobs, D. B.—Foreman Hammer Dept., Richmond Forgings Corp., Belle Isle, Richmond, Va.

Jacobs, Elmer.—Treas. and Gen. Mgr. National Spring & Wire Co., Albion, Mich.

Jacobs, H. A.—Supt. Elect. Dept. T. A. Bryson, 5-9 Perry St. E., Savannah, Ga.

Jacobs, H. W.—Akron, Colo. (Waltham.)

Jacobsen, E. C.—Sec. and Treas. E. C. Walker & Co., 1913-23 Logan St., Louisville, Ky.

Jacobson Machine Mfg. Co.—Warren, Pa. Mfrs. air compressors.

Jacobson, C. B.—Director Pittsfield Spark Coil Co., Dalton, Mass.

Jacoby, K. R.—Sec., Pur. Agt., Sales and Advt. Mgr. Miami Cycle & Mfg. Co., Grand Ave., Middletown, O.

Jacquemin, J. B.—Route de la Mouille, Morez, Jura, France. Mfr. goggles.

Jacquot, Georges.—30 rue de Prieze, Troyes, France. Mfrs. motorcycles.

Jager Gas Engine Co.—33 Canal St., Providence, R. I. Mfrs. gasoline marine motors.

James & Brown, Ltd.—395 Oxford St., London W., England. Mfrs. clutches.

James & Co., Fred S.—171 La Salle St., Chicago, Ill. Automobile insurance against fire, theft, transportation and collision.

James Co., A.—1st and King St., La Crosse, Wis. (Winton.)

James, J. M.—Treas. Lane Motor Vehicle Co., Poughkeepsie, N. Y.

James, J. T.—Loveday St., Birmingham, England. Mfr. metallic rims.

James, M.—62 rue St. Antoine, Paris, France. Mfr. electric lamps.

Jamison, C. S.—Sales Mgr. Dayton Motor Car Co., Dayton, O.

Jamestown Iron Works Co.—11 Shrannan Pl., Jamestown, N. Y. Est. 1906. Garage, 10 cars; repairing.

Jamesville Mfg. Co.—Jamesville, N. Y. Mfrs. hubs, nipples, steel rims, steering apparatus, steering wheels, wire wheels, wood wheels.

Jamming.—The "seizing" or fixing of a bearing which sometimes occurs when, through inadequate lubrication, it becomes hot. See Seizing.

Janesville Automobile Club.—Frank H. Blodgett, Sec., Janesville, Wis.

Janney Auto & Launch Co.—6040 Hurst St., New Orleans, La. (Lambert.)

Janney, Joa. A., Jr.—Treas. The Auto-light & Motor Supply Co., Inc., 506-8 N. Broad St., Philadelphia, Pa.

Janney Motor Co.—Flint, Mich. Mfrs. automobiles, gasoline.

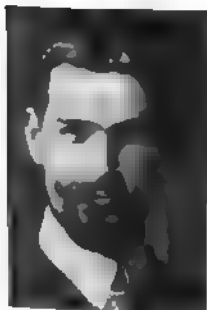
Janney Steinmetz & Co.—4th and Market Sts., Philadelphia, Pa. Mfrs. malleable iron castings, stampings, tanks, tire irons, gasoline lock valves, wrenches, pressed steel products.

Jansen & Huestis.—Fonda, N. Y. Garage.

Janassens, Ateliers, A.—Rue du Gazometre, St. Nicholas, Belgium. Mfrs. steering gears.

Jardet, B.—22 Bvd. Bourdon, Neuilly, France. Mfrs. radiators.

Jardine, Robert.—Chief Engineer of the Royal Motor Car Co., Cleveland, O. B. Cleveland. Oct. 8, 1876. Ed. Cleveland public schools, Birmingham Technical School, International Correspondence Schools. Mem. Century Club. Res. 1860 E. 70th St. Office. The Royal Motor Car Co., Cleveland, O. In the trade since 1898.



Jarecki, Alex.—Vice-Pres. Continental Rubber Works, 19th and Liberty Sts., Erie, Pa.

Jarecki, Chas.—Sec. Continental Rubber Works, 19th and Liberty Sts., Erie, Pa.

Jarecki Mfg. Co.—Erie Pa. Mfrs. brass fittings.

Jarrott, Charles.—45 Great Marlborough St., London. B. in England in 1875. Mem. of the Automobile Clubs of France, England, Germany and Ireland. Manager of the De Dion-Bouton Co., Ltd., and of Vedrine, Ltd. Represented England in the Bennett Cup race in 1903 and 1904, and won the Circuit of Ardennes.

Jarvis, Levi.—Pingree, Stutsman Co., N. D. (Jewel.) Est. 1907. Repairing.

Jaw.—The part of a vise, clamp, chuck, clutch, etc., which actually comes into contact with the piece of work to be held.

Jaw-clutch.—See Clutch, Jaw.

Jaynes & Co., W. C.—721 Main St., Buffalo, N. Y. (Royal, Knox.)

Jaynes Auto Supply Co.—806 Main St., Buffalo, N. Y. Est. 1906. Supply house, handling Prest-O-Lite tanks, Weed chain grips, Witherbee storage igniter, M. & M. cement and a general line of automobile supplies. W. C. Jaynes, Prop.

Jaynes, W. C.—Proprietor Jaynes Auto Supply Co., 806 Main St., Buffalo, N. Y.

Jeannerot et Perrin.—27 rue de Vendome, Lyons, France. Mfrs. non-skids.

Jeantaud.—51 rue de Ponthieu, Paris, France. Mfrs. storage batteries.

Jeantaud, Charles.—Engineer. 51 Rue de Ponthieu, Paris. Born at Limoges, Dec. 23, 1843; died Dec. 1, 1906. Officer of the Academy, Chevalier of the Legion of Honor, former president of the Syndical Chamber of the Automobile. In 1881 he constructed the first electric carriage with accumulators. In 1905 he invented the E. I. accumulator.



Jeantet, Eugene.—238 Grande Rue, Morez, Jura, France. Mfr goggles.

Jeck, Henry.—Head Athletic Supply Dept. Collister & Sayle, 224 Superior Ave. N. W., Cleveland, O.

Jef Mfg. Co.—1562 Broadway, Denver, Colo. Mfrs. valve grinders.

Jefferson Brass Foundry.—209 E. King St., Brooklyn, N. Y. Mfrs. brass, bronze, aluminum and copper castings.

Jeffery & Co., Thos. B.—145 Columbus Ave., Boston, Mass. (Rambler.)

Jeffery & Co., Thos. B.—302-304 Wabash Ave., Chicago, Ill. (Rambler.)

Jeffery & Co., Thos. B.—455 Broadway, Milwaukee, Wis. (Rambler.) Incorporators, Chas. T. Jeffery, Pres.; Harold W. Jeffery, Vice-Pres. and

Treas.; C. C. Hutchinson, Sec.; A. W. Shattuck, Resident Mgr.

Jeffery & Co., Thos. B.—3 Marshall St., Newark, N. J. (Rambler.)

Jeffery & Co., Thos. B.—207 N. Broad St., Philadelphia, Pa. (Rambler.)

Jeffery & Co., Thos. B.—121 Valencia St., San Francisco, Cal. (Rambler.)

Jeffrey & Co., Thos. B.—Kenosha, Wis. Mfrs. gasoline automobiles and commercial vehicles. (Rambler cars.)

Jeffery-Dewitt Co.—219 High St., Newark, N. J. Mfrs. spark plugs. J. A. Jeffery, Pres.; B. A. Jeffery, Vice-Pres.; M. C. Dewitt, Sec. and Treas.

Jeffords. Witherspoon.—58 Queen St., Charleston, S. C. (Maxwell, Waltham.)



Jenatzy.—A well-known automobile racer. In 1903 he won the Bennett Cup race in Ireland and classed himself as fifth in the Vanderbilt Cup race in 1906. He is the inventor and manufacturer of the pneumatic tire that bears his name.

Jenatzy-Leleux, Manufacture Générale de Caoutchouc.—10 rue Stephenson, Brussels, Belgium. Mfrs. solid tires, non-skids, pneumatic tires.

Jencick Motor Mfg. Co.—Port Chester, N. Y. Mfrs. gasoline automobile and marine motors. Garage.

Jenkins & Co., W. M.—286 Columbus Ave., Boston, Mass. (Mitchell.)

Jenkins Bros.—1607 W. Broad St., Richmond, Va. (Pope-Hartford.)

Jenkins Motor Co., E. A.—1216 Main St., Columbia, S. C. (Stoddard-Dayton, Rambler.)

Jenkins, J. W.—237 Rutgers St., Rochester, N. Y. (Jenkins Spec.)

Jenkins, T. B.—Pres. and Treas. Charleston Motor Co., 161 Meeting St., Charleston, S. C.

Jenkins, T. B., Jr.—Sumter, S. C. (Reo.)

Jenkins, Warner Haddon.—Gen. Mgr. N. Y. News Bureau. B. Philadelphia, Pa., Feb. 27, 1865. Ed. Friends' School, University Class of Newton School, and private tuition. Pres. and Prop. Financial Bulletin. Pres. Motor Print Co., 418-20 Sansom St., Philadelphia, Pa.

Jenks, W. L.—Treas. The Lee Mfg. Co., Conners St., Port Huron, Mich.

Jenness, Charles L.—Pres. and Treas. A. & J. Mfg. Co., 26 W. Randolph St., Chicago, Ill.

Jennings, Hulbert R.—Sec. and Treas. Graves & Congdon Co., Oak St., Amesbury, Mass.

Jensen Auto Co.—206 W. 65th St., New York City. Garage.

Jephson, Geo. S.—Asst. Gen. Mgr. J. M. Quinby & Co., 21-39 Division St., Newark, N. J.

Jergens Co., Andrew.—Cincinnati, O. Mfrs. hand soaps.

Jerome Auto Garage.—Jerome Ave. and 166th St., New York City. Garage.

Jerome, F. S.—Vice-Pres. Uncas Specialty Co., 21 Shipping St., Norwich, Conn.

Jersey Brake Co.—93 Green St., Newark, N. J. Mfrs. jacks.

Jersey Shore Cycle Co.—Jersey Shore, Pa. (Winton.)

Jervia, Arthur Nichols.—Adv. Mgr. American Locomotive Automobile Co.,



free lance writer and press agent. B. Amityville, L. I., May 26, 1865. Ed. grammar school. Mem. N. Y. Motor, N. Y. Press, Pleaides. Res., Hotel Monticello. Office, 29 W. 42d St., New York City. In trade since 1894. Used first motorcycle

1874. Was author of automobile articles in the New York Sun, 1896.

Joseph & Co., W. R.—499 Clinton St., Buffalo, N. Y. Mfrs. annunciators.

Jet.—A fine stream of fluid. (2) The nozzle from which a stream of such fluid issues; for example, the nozzle from which gas issues for burning, or from which the gasoline is drawn in order to cause it to spray in the mixing chamber of the carburetter. See Nozzle and Nipple.

Jewel Auto Co.—117 W. 16th St., Los Angeles, Cal. (Jewel.)

Jewel Automobile Co.—Washington, D. C. (Jewel.)

Jewel Automobile Sales Agency.—1375 Ontario St., Cleveland, O. (Jewel.)

Jewett, Alfred R.—Abington, Mass. (Cadillac.)

Jewett City Auto Station.—Jewett City, Conn. Garage.

Jewett's Garage.—58 Pleasant St., Claremont, N. H. (Rambler, Maxwell.) Est. 1907. Garage, 25 cars. Repairing. B. M. Jewett, Prop.

Jew's Pitch.—See Asphaltum.

Jig.—A device for holding parts of machinery in their relative position while they are being operated on by hand or otherwise.

Jobusch, W.—21 Nürnbergerstrasse, Berlin, Germany. Mfrs. horns.

Jockey Pulley.—See Pulley, Jockey.

Joel, Chas.—Master Mechanic Martini Import Co., 239 W. 50th St., New York City.

Johns & Armartrout.—Fitzgerald, Ga. Garage.

Johns-Manville Co., H. W.—100 William St., New York City. Mfrs. fire extinguishers, gaskets, packing, asbestos.

Johnson & Co., Isaac G.—Spuyten Duyvil, New York City. Mfrs. malleable iron castings, steel castings, chrome-nickel steel.

Johnson & Giles.—P. O. Box 533, Tampa, Fla. (Buick.)

Johnson & Son, Geo. E.—Chestnut St., New Paltz, N. Y. (Jackson, Ford.) Garage.

Johnson, A. D.—1446 Wabash Ave., Chicago, Ill. Mfr. automobile tops.

Johnson, A. D.—Sec. Diamond Chain & Mfg. Co., Indianapolis, Ind.

Johnson, A. H.—Sec. Richard Eccles Co., Clark and S. Division Sts., Auburn, N. Y.

Johnson, Alfred.—89-97 Orange St., New Haven, Conn. (Springfield.)

Johnson, A. S.—Sec. Maxwell-Briscoe-Chase Co., 1407-9 Michigan Ave., Chicago, Ill.

Johnson, Dr. P. T.—23 E. 9th St., Erie, Pa. (Frayer-Miller, Lambert.) Est. 1905.

Johnson Carriage Co.—Forest St. and East Ave., New Canaan, Conn. Est. 1873. Partnership Howard F. Johnson, Geo. Herbert Johnson. Two-story brick fireproof garage; repairing, accessories, etc.

Johnson, C. H.—55 S. Forsythe St., Atlanta, Ga. (Stevens-Duryea.)

Johnson, C. W.—W. Peter St., Uniontown, Pa. (Franklin, Pope line.)

Johnson, D. E.—Ambler, Pa. Garage.

Johnson, E. C.—Compton, Cal. (Maxwell.)

Johnson, Fred L.—86 N. Main St., Concord, N. H. Garage.

Johnson Garage, The.—Wisconsin and Blunt Sts., Charles City, Ia. Garage.

Johnson, Geo. Herbert.—Partner Johnson Carriage Co., Forest St. and E. Ave., New Canaan, Conn.

Johnson, Gus J.—Pres. Laramie Cycle & Garage Co., 314 2d St., Laramie, Wyo.

Johnson, Henry S.—Clayton, N. Y. (Waltham.)

Johnson, Howard F.—Partner Johnson Carriage Co., Forest St. and East Ave., New Canaan, Conn.

Johnson, Itheul M.—Main St., Corning, N. Y. Garage.

Johnson, John E.—Central St., Fall River, Mass. (Cadillac.)

Johnson, J. W.—Treas. Kokomo Electric Co., 339 Smith St., Kokomo, Ind.

Johnson, Llewellyn H.—Pres. National Auto Co., 957 S. Main St., Los Angeles, Cal.

Johnson Motor Co., The.—Chester, Pa. Mfrs. gasoline automobile motors.

Johnson, P. A.—Cambridge, Ill. (Rapid, Glide.)

Johnson, Paul F.—Sec., Pur. Agt. Johnson Service Co., Mich. and Jefferson Sts., Milwaukee, Wis.

Johnson Service Co.—Cor. Michigan and Jefferson Sts., Milwaukee, Wis. Makers of the Johnson Steamless steam car; first marketed in 1905. Three models made since. Cap. \$900,000. W. S. Johnson, Pres. and Gen. Mgr.; Paul F. J. Johnson, Sec. and Purch. Agt.; Emil Borisch, Supt.

Johnson Service Co.—20th St. and Broadway, New York City. (Johnson.)

Johnson-Shields Auto Co.—Long Beach, Cal. (Oldsmobile.)

Johnson Sporting Goods Co., Iver.—163-165 Washington St., Boston, Mass. Mfrs. gasoline funnels, tire chains, anti-skid devices.

Johnson, Walter B.—Essex Junction, Vt. (Buick.)

Johnson, Warren C.—Independence, Kan. (Jewel.)

Johnson, Mrs. W. C.—Pres. Chicago Women's Motor Club, Chicago, Ill.

Johnson, Wilbur C.—Asst. Mgr. Pope Motor Car Co., 139 S. E. St., Indianapolis, Ind.

Johnson, W. L.—Pres., Gen. Mgr. Johnson Service Co., cor. Mich. and Jefferson Sts., Milwaukee, Wis.

Johnson, W. L.—Vice-Pres. and Sec. Borbein Auto Co., 2109-11 N. 9th St., St. Louis, Mo.

Johnson's Garage.—Atlantic and Ohio Aves., Atlantic City, N. J. (Winton.)

Johnston, Chas. M.—232 5th Ave., Pittsburg, Pa. (American Mors.)

Johnston, F. P.—Vice-Pres. and Mgr. Detroit Screw Works, Riopelle and Franklin Sts., Detroit, Mich.

Johnston, Geo. H.—Sparrows Point, Md. Mfr. steel castings.

Johnston Machine Co.—86 High St., Woodbury, N. J. Mfrs. carbureters.

Johnston, R.—12 N. Main St., Wilkesbarre, Pa. (Reo, Rambler, Maxwell, Knox.)

Johnston, Robert Bell.—Automobile writer. B. Detroit, Mich., Aug. 5, 1873. Ed. public schools of Detroit. Res., Hotel Earle, 103 Waverly Pl. Office, 29 W. 42d St., New York City. Writer on cycling affairs since 1893 and on automobile since 1901.

Johnston, Richard Harry.—Adv. Mgr. The White Co. B. Brooklyn, N. Y., Feb. 23, 1880. Ed. Brooklyn High school, Cornell University, Columbia University. Editor of "White Bulletin" and compiler of "White Route Book." Mem. N. Y. Motor, Quaker City Motor, Harrisburg Motor. Crescent Athletic, Ameri-

can Chemical Society, American Inst. of Elec Engrs., Engineers' Club. Res. 972



Park Pl., Brooklyn, N. Y. Office, 1402 Broadway, New York City. In automobile trade since 1903. Participant in Pittsburg Endurance Run, '03; St. Louis Tour, '04; St. Paul Tour, '05, and Glidden Tour of '05, '06 and '07. Also official in principal

endurance runs of clubs in New York, Philadelphia and Harrisburg in '07. Mem. Touring Board of A. A. A. and of Legislative Committee of N. Y. State Ass'n

Johnston, Ltd., W. & A. K.—Edinburgh, Scotland. Pubs. maps.

Johnston, W. R.—Vice-Pres. and Gen. Supt. The Barndt-Johnston Auto Supply Co., 426 Donaldson St., Columbus, O.

Johnston, W. S.—806 White Bldg., Buffalo, N. Y. Mfr. sheet and bar iron and steel.

Johnstown Auto Co.—235 Bedford St., Johnstown, Pa. (Peerless, Wayne, Rambler, Queen.)

Joint, Ball.—See Ball-and-Socket Joint.

Joint, Ball-and-Socket.—A joint in which one member consists of a ball-like head fitting a corresponding recess in the other. It allows play in all directions except along the axis of the two members.



Joint, Bayonet.—An arrangement for connecting two pieces of mechanism end to end. It consists, as a general thing, of a sleeve, B, operatively connected with A, and capable of turning upon it until the end of the slot with which it is provided comes into contact with the snug, E, connected with the piece A.



Joint, Butt.—A joint in which two pieces come square against each other endwise. A term used in contradistinction to "lap-joint."

Joint, Cardan.—A universal joint used on automobiles, so-called from the name of its inventor, Cardan. See Universal Joint.

Joint, Carvel.—A term used of a vessel's timbers in contradistinction to "clinker."

Joint, Compensating.—See Joint, Slip, and Joint Expansion.

Joint, Cup.—Same as ball-and-socket joint.

Joint, Dovetail.—The junction of two pieces by means of flaring tenons and corresponding mortises of the respective parts.

Joint, Expanded.—A steam-tight joint between the end of a tube and the shell of a boiler. The tube is inserted into a hole in the shell and its end then expanded into intimate connection with the latter by means of an appropriate tool.

Joint, Expansion.—See Slip-joint.

Joint, Fantail.—Same as dovetail joint

Joint, Flange.—A pipe-joint in which each pipe is provided with a large flat plate, the plates being bolted together to form the joint. A gasket or washer is usually inserted between the flanges to make the joint tight.

Joint, Flush.—The same as Butt-joint, q. v.

Joint, Globe.—A form of universal joint which permits a shaft to have a certain play or to transmit power in a direction other than



that of the primary shaft.

Joint, Hooke's.—The same as Cardan Joint.

Jump-joint.—The same as Butt-joint, q. v.

Joint, Knuckle.—A hinged joint between two rods, one of which is provided with an eye fitting into a yoke, C (see figure) on the other. A pin, A, passing through the eye forms an axis about which the two members can turn. (2) A universal joint.



Joint, Lap.—A joint between two plates, one of which lies over the other for a short distance.

Joint-pin.—A kind of bolt so placed as to be in shear.

Joint, Reducing.—A coupling for connecting pipes of different diameters.

Joint, Rivet.—Used in boilers, girders, etc. It is suitable for joints which have to stand a tangential or shearing force, that is to say, where the rivets have to resist forces that tend to move the plates past each other.

Joint, Rust.—A caulking for joints, consisting of 13 ounces sal-ammoniac, 16 to 18 ounces of cast-iron borings, and sufficient water to wet the mixture thoroughly. Sometimes half an ounce of sulphur is added. This cement is caulked into the joints with a caulking-iron three-quarters of an inch wide and one-quarter of an inch thick. A rusting follows and seals the joint.

Another formula is: Fifty to 100 parts of iron borings, pounded and sifted and

mixed with 1 part of sal-ammoniac and sufficient water to give the mixture a pasty consistency.

Joint, Screw.—A socket-joint in which the parts to be joined are tightly screwed together.

Joint, Shackle.—A joint formed by a clevis and bolt. See Clevis.

Joint, Side.—One of the S-shaped iron or steel-hinged levers that support the hood of a carriage and permits of its being raised or lowered.

Joint, Sleeve.—A joint between sections of pipe, each of which is inserted in a sleeve.

Joint, Slip.—A joint allowing of limited longitudinal motion to compensate for any difference in distance between the driving and driven members; usually applied to a universal joint. Hence also the name "compensating joint," q. v.



Joint, Socket.—A joint in which two pipes are connected by fitting one within the enlarged end of the other.

Joint, Swivel.—A joint having a swivel permitting of twisting.



Joint, T.—A joint for connecting two pipes, two of which are at right angles to the third, by means of a fitting called a "T."

Joint, Thimble.—An expansion sleeve joint in a line of pipes.

Joint, Toggle.—A combination of levers by means of which great pressure can be applied. Two rods are hinged together (see figure) so as to make an obtuse angle with each other, one of the rods being attached to a fixed support or pivot and the other to the mechanism to which the pressure is to be applied. Force is applied at the junction of the two rods in such a manner as to tend to straighten the combination. As the rods are brought gradually into line with each other a great and increasing pressure is exerted at the ends.



Joint, Union.—See Union.

Joint, Universal.—A joint for transmitting power from one shaft to another when they are not in line, or if there is a slight variation in position during working. The ends of the shafts adjacent to each other are provided with a



fork or yoke, each of which is set at right angles to the other. Cross-bolts

connect these forks in such a way that each fork is free to swivel on a bolt which acts as a pivot. See Universal Joint.

Jointless Rim Co., Ltd.—Long Acre, Birmingham, England. Mfrs. metallic rims.

Joliet Auto & Garage Co.—100 Cass St., Joliet, Ill. (Winton.)

Joly, A.—123 bvd. Pereire, Paris, France. Mfrs. automatic starters, jacks.

Joly, M.—Pres. and Treas. Automobile Road Map Co., 428 Lafayette St., New York City.

Jonas, Aug. A.—Partner Jonas Automobile Co., 726 National Ave., Milwaukee, Wis.

Jonas Automobile Co.—726 National Ave., Milwaukee, Wis. (Peerless, Cadillac.) Est. 1900. Cap., \$25,000. Aug. A. Jonas, Wm. Jonas and Gustave Jonas, partners. Garage, 75 cars; repairing.

Jonas, Gustave.—Partner Jonas Automobile Co., 726 National Ave., Milwaukee, Wis.

Jonas, Wm.—Partner Jonas Automobile Co., 726 National Ave., Milwaukee, Wis.

Jones & Brandes.—109 Burlington Ave., Hastings, Neb. (Premier, Reo.)

Jones & Co., Howard T.—602 E St., N. W., Washington, D. C. Vulcanizing and tire repairing.

Jones & Co., Phineas.—305 Market St., Newark, N. J. Mfrs. wood rims and wheels.

Jones & Hopkins.—Mankato, Minn. (Rambler.)

Jones & Laborde.—Oshkosh, Wis. Mfrs. motor boats.

Jones & Laughlin Steel Co.—1019 White Bldg., Buffalo, N. Y. and Pittsburgh, Pa. Mfrs. sheet and bar iron and steel.

Jones & Shumacher.—Wilmington, Del. Repair shop.

Jones, A. R.—Pres. Danbury Hardware Co., 249-51 Main St., Danbury, Conn.

Jones, B. G.—Pres. and Gen. Mgr. E. J. Jones Co., Inc., Arlington Heights, Mass.

Jones, C.—Beatrice, Neb. (Oldsmobile.)

Jones Co., Inc., E. J.—Arlington Heights, Mass. Mfrs. steel, brass, bronze and bellmetal balls, small forgings. Cap., \$500,000. Est. 1887. B. G. Jones, Pres. and Gen. Mgr.; B. G. Morgan, Vice-Pres.; H. G. Storm, Treas.

Jones Cycle & Automobile Co.—132 E. Main St., Portland, Ind. Garage.

Jones, David C.—Sec. The Lunkenheimer Co., Cincinnati, O.

Jones, Edw. H.—Pres. Sheldon Axle Co., Wilkesbarre, Pa.

Jones, E. E.—11 Tremont St., Tona-wanda, N. Y. Garage.

Jones, Ernest La Rue.—Editor American Magazine of Aeronautics. B. Haverstraw, N. Y., Aug. 14, 1882. Ed. Haverstraw Academy. entered Eastman's Business College and later studied art at Yale. Asst. Sec. Aero Club of America, Sec. Jamestown Aeronautic Congress, Chairman Providence Aeronautical Committee, 1907. Half owner American Magazine of Aeronautics. Mem. Aero C. A. Recreations, automobiling, aeronautics, boating, racing. Res., 142 W. 65th St., New York City.

Jones, E. M.—Los Angeles, Cal. (Motor Racycle.)

Jones, Frank S.—629 Filbert St., Philadelphia, Pa. Machine work to order.

Jones, Geo. L.—910 S. Walnut St., Muncie, Ind. Vulcanizing.

Jones, Henry P.—31 Waeman Ave., Newark, N. J. Garage.

Jones, H. M.—1329 Michigan Ave., Chicago, Ill. (American Mercedes.)

Jones, J. H.—Designer, Knox Automobile Co., Springfield, Mass.

Jones, John E.—173 South St., Utica, N. Y. Mfr. wood wheels.



Jones, Joseph W.—Mfr. speed indicating devices. B. Saratoga Springs, N. Y., June 27, 1876. Mem. A. C. A. Res., 225 Riverside Drive. Office, 76th St. and Broadway, New York City. In the trade since 1897.

Jones, Mark C.—Converse, Ind. (Walham.) Est. 1906. Garage, 6 cars.

Jones Motor Co., Geo. H.—6th St., Camden, N. J. Machine work to order.

Jones Speedometer Co.—Broadway and 76th St., New York City. Mfrs. speedometers, odometers, automobile clocks, automobile annunciators. Mem. M. & A. M.

Jones, W. H.—134 Waverly Ave., Newton, Mass. Mfrs. speedometers, tire pumps.

Jones, Wm. S.—112 N. Broad St., Philadelphia, Pa. Sales Agt. Lea speedometers, Lea speedistimeters, Phelps vehicle recorder, Boss filter. Est. 1904. Branches: Boston, 12 Columbus Ave.; Chicago, 1303 Michigan Ave.; New York, 101 W. 66th St.

Jones, W. T.—Supt. factory, Edmunds & Jones Mfg. Co., 315 Riopelle St., Detroit, Mich.

Joo, Raymond S.—79 Orange St., Newark, N. J. (Frayer-Miller.)

Joos Söhne und Co.—Schwanthalerstrasse 51, Munich, Germany. Mfrs. automobile motors, motorcycles.

Joplin Auto Co.—618-620 Wall St., Joplin, Mo. (Holsman.)

Jordan Automobile Co.—217 4th St., S., Minneapolis, Minn. (Locomobile, Franklin, Corbin.) Est. Jan., 1905. Cap., \$20,000. Theo. C. Jordan, Pres.; F. L. Moffett, Sec. and Treas. Garage, 75 cars. Repairing.

Jordan, E. B., Jr.—873 Union St., Brooklyn, N. Y. Mfr. tool boxes.

Jordan, F.—Sec. and Treas. Magnolia Metal Co., 113-15 Bank St., New York City.

Jordan, R. C.—Columbus, Ga. (Mitchell.)

Jordan, Theo. C.—Pres. Jordan Automobile Co., 217 4th St. S., Minneapolis, Minn.

Jordan, R. H.—110 Sheridan St., Allegheny, Pa. Mfr. piston rings.

Jorgensen, Chris.—Holdredge, Neb. Garage.

Josephs, J. S.—Treas. and Gen. Mgr. Automobile Import Co., 1786 Broadway, New York City.

Joslyn Automobile Co.—Rockford, Ill. (Rambler.)

Joule.—A unit of work equal to ten million ergs. It is sometimes used in electrical calculations, but the unit of power, which is one joule per second, is more frequently employed. This unit is termed a "watt," q. v.

Jourdanet et Cie, Baron.—29 cours Lafayette, Lyon-Villeurbanne, France. Mfrs. carbureters.

Journal.—The part of a revolving shaft or spindle that runs inside the bearing.

Journal, Axle.—See Axle.

Journal of Electricity, Power and Gas. Rialto Bldg., San Francisco, Cal. Technical Pub. Co.; weekly.

Joy Auto Co., C. P.—368 Minnesota Ave., St. Paul, Minn. (Packard, Pope-Hartford, Pope-Waverley.)

Joy Bros.—187 E. 6th St., Minneapolis, Minn. Garage.

Joy, Henry B.—Gen. Mgr. Packard Motor Car Co., Detroit, Mich.

Joyce Auto Co., F. G.—705 Chestnut St., Chattanooga, Tenn. (Buick, Thomas Flyer.)

Joyce, James.—Mgr. American Locomotive Automobile Co. B. Ireland, Feb. 15, 1868. Ed. common and grammar school. Mem. Engineers', Republican Clubs (N. Y.), R. I. A. C. Res., 310 Norwood Ave., Providence, R. I. Office, 1886 Broadway, New York City. In the trade since Sept., 1894. Used first car 1896.

Joyce, Ralph.—1531 Broadway, New York City. Automobile pawnbroker and dealer in second-hand cars.

Jubisch, Carl.—12 Weststrasse, Schoenefeld, Leipzig, Germany. Mfr. motorcycles.

Judd & Leland Mfg. Co.—Hibbard Ave., Clifton Springs, N. Y. Mfrs. circulating pumps, gauges, tire pumps, axles, nipples. Mem. M. & A. M. Cap., \$75,000. Est. 1907. W. A. Judd, Pres., Gen. Mgr. and Buyer; Z. H. Haney, Sec. and Treas.

Judkins & Sons Co., J. B.—Merrimac, Mass. Mfrs. wood and metallic bodies.

Judson, J.—Sec., Treas. and Gen. Mgr. Cape Ann Tool Co., Granite St., Pigeon Cove, Mass.

Judson, R. W.—Vice-Pres. Continental Motor Mfg. Co., Muskegon, Mich.

Juengling, J. W.—Vice-Pres. Globe Machine & Stamping Co., 3868 Hamilton Ave., N. E., Cleveland, O.

Julien, J.—110 rue St. Maur, Paris, France. Mfr. clutches.

Julien-Pinçon et Cie.—54 bvd. Magenta, Paris, France. Mfrs. detachable rims.

Jump-spark.—See Ignition.

Jumping Up.—Thickening the end of an iron rod by hammering it in the direction of its length; an operation called also "upsetting."

June Bros.—Garrison St., Freemont, O. Garage.

Jungclass Auto Co.—Reading Road, Avondale, Cincinnati, O. (Mitchell, Dragon, Dolson.)

Jungmann, Felix.—Friedrichsgracht 42, Berlin, Germany. Mfr. oil lamps, horns.

Junior, Fabbrica Torinese Automobili.—56 corso M. d'Azeglio, Turin, Italy. Mfrs. gasoline automobiles. (Junior cars.)

K

K.—A symbol for the "specific inductive capacity" of a dielectric.

K.—A symbol for the "magnetic susceptibility" of iron and steel.

K.-W. Ignition Co., The.—Whitney Bldg., Cleveland, O. Mfrs. magnetos and spark plugs. Cap., \$200,000. Est. May, 1906. J. A. Williams, Pres.; Wm. Kaple, Vice-Pres.; A. F. Williams, Sec. and Treas.

Kachline, J. C.—S. Bethlehem, Pa. (Cameron.)

Kaestner, Carl.—69 Berlinerstrasse, Leipzig, Germany. Mfr. tire pumps.

Kaffel, Ch.—212 bis Blvd. Pereire, Paris, France. Mfrs. acetylene lamps.

Kahlenberg Bros.—Two Rivers, Wis. Mfrs. gasoline automobile motors.

Kalamazoo Carburetter Co.—1301 Grand Ave., Kalamazoo, Mich. Mfrs. multiple-jet carburetters.

Kalamazoo Spring & Axle Co.—Kalamazoo, Mich. Mfrs. automobile, carriage, wagon and seat springs. Est. 1870. Jas. L. Houghteling, Pres.; Chas. H. Eaton, Vice-Pres. and Mgr.; F. V. Wicks, Sec. and Treas.

Kalb & Berger Mfg. Co., Inc.—1565 Broadway, New York City. Mfrs. wood and metallic bodies, transmission gears.

Kalbfleisch Co., Franklin H.—Broadway and 16th St., New York City. Mfrs. sulphuric acid, electrolyte, distilled water, battery fluids, non-freezing compounds. Cap. \$1,000,000. Franklin H. Kalbfleisch, Pres.; A. S. Malcomson, Vice-Pres.; Philip S. Tilden, Sec.; Herbert Foster, Asst. Treas.; A. B. Savage, Asst. Sec.

Kalbfleisch, Franklin H.—Pres. Franklin H. Kalbfleisch Co., Broadway and 16th St., New York City.

Kalbfleisch, G. C.—Tiffin, O. (Maxwell.)

Kalisch Air Brake Co.—1317 Chestnut St., St. Louis, Mo. Mfrs. brakes, air compressors.

Kaltenbach, Fred.—12 N. Jefferson St., Chicago, Ill. Mfr. storage tanks.

Kampen & Range.—Monmouth, Ill. (Holsman.)

Kane-Champlin Co.—Ellicott and Tupper Sts., Buffalo, N. Y. (Premier, Reo.)

Kane, Francis M.—Seattle, Wash. (Wayne.)

Kanies & O'Connors.—Troop St., Woodstock, Ill. Repairing.

Kankakee Automobile Club.—C. H. Cobb, Sec., Kankakee, Ill.

Kansas City Motor Car Co.—Sheffield, Mo. Makers of the Phoenix truck. First marketed in 1907. One model made since. Cap. \$150,000. F. E. Wear, Pres.; L. M. Dieterich, Gen. Mgr. and Designer; W. T. Norton, Supt.

Kanter Co., R. J.—647 Water St., New York City. Mfrs. oils.

Kappelman, J. A.—Linn, Kan. (Holsman.)

Karbach Automobile & Vehicle Co.—13th and Howard Sts., Omaha, Neb. Mfrs. wood and metallic bodies, auto tops, automobiles, gasoline commercial. (Jewel.)

Karlstrom & Co.—Frithi, Sweden. (Waltham.)

Karr Portable House Co.—605 Bellplaine Ave., Chicago, Ill. Mfrs. portable houses.

Kasner, A. H.—152 Church St., New York City. Supply house.

Kathode.—See Cathode.

Kation.—See Cation.

Katonah Garage.—Railroad Ave. and Allen Court, Katonah, N. Y. (Premier, Maxwell.)

Katz & Co., Frank.—Birmingham, Ala. (Haynes.)

Kaufman, Carl.—Officer Royal Battery Co., 108-10 Duane St., New York City.

Kaufmann, Chas.—75 S. Main St., Oshkosh, Wis. Mfr. carburetters, gasoline strainers.

Kaufman, Clyde B.—247 W. 3rd St., Williamsport, Pa. (Ford.)

Kaufman, D. W.—Sec., Treas. and Gen. Mgr. De Luxe Motor Car Co.; Vice-Pres. and Gen. Mgr. C. H. Blomstrom Motor Co., Clark and Jefferson Aves., Detroit, Mich.

Kaufman, N. M.—Pres. C. H. Blomstrom Motor Co. and De Luxe Motor Car Co., cor. Clark and Jefferson Aves., Detroit, Mich.

Kavanaugh, Fred, W.—Troy, N. Y. Garage.

Kaw Valley Auto.—3130 Main St., Kansas City, Mo. (Premier, Mitchell.)

Kay Alexander Cycle Co.—320 Queen St., Toronto, Canada. Garage.

Kearns, Thos. F. S.—Pres. and Treas. M. Caffrey Leather Co., Frelinghuysen Ave. and Meeker St., Newark, N. J.

Keasby & Mattison Co.—Ambler, Pa. Mfrs. portable houses, asbestos, packing.

Keasby Co., Robert A.—100 N. Moore St., New York City; 141 Ellicott St., Buffalo, N. Y. Mfrs. packing, asbestos.

Keat & Chevalier.—521 Van Ness Ave., San Francisco, Cal. Repairing and vulcanizing.

Keating Garage Co.—145 W. 2d St., Oswego, N. Y. Supplies; repairing; garage.

Keats Auto Co., H. L.—7th and Oak Sts., Portland, Ore. (Thomas Flyer, Thomas-Detroit, Pope-Toledo, Pope-Hartford, Pope-Waverley, Franklin, Buick, Oldsmobile.) Est. 1904. Garage, 75 cars; repairing.

Keck, L. J.—Vice-Pres. Badger Brass Mfg. Co., 11th Ave., 36th to 37th St., New York City, and Kenosha, Wis.

Kedge.—A small anchor for steadying a vessel and for warping her. To kedge is to move by means of a kedge, to warp.

Keefe, C. W.—Sec. Loring Speed Gauge Co., 91 Marshall St., Somerville, Mass.

Keefe, J. C.—133 Main St., Herkimer, N. Y. Garage.

Keefer, Wm. N.—88 E. Main St., Westminster, Md. Garage.

Keel.—The lowest and principal part, the "backbone" of a boat, running fore and aft the whole length and supporting the "ribs," "stern" and "stern-post."

Keel, to be on an Even.—A boat to be so trimmed as to sit evenly upon the water.

Keeler Co., E.—3d and West Sts., Williamsport, Pa. (Cadillac, Buick, Thomas, Franklin, Pope-Hartford, Pope-Waverley.) Est. 1865. Inc. 1888. Cap. \$120,000. C. La Rue Munson, Pres.; F. T. Moore, Treas.; S. A. Courson, Sec. Garage, 40 cars; repairing.

Keeley, F. W.—Royersford, Pa. (Crawford.)

Keelson.—An internal keel laid upon the middle of the floor-timbers immediately over the keel.

Keenan Bros.—273 Valencia St., San Francisco, Cal. Repairing.

Keenan, John J.—Pres. Churchill Cabinet Co., 72 Churchill St., Chicago, Ill.

Keene Auto Cycle Co.—Keene, N. H. (Maxwell.)

Keeney, E. P.—Boulevard and Cottage St., Jersey City, N. J. Garage.

Keeper.—See armature.

Keet, N. W.—Northfield, Mass. Garage.

Keeton, F. M.—Mgr. Motor Sales Co., 1771 Broadway, New York City.

Kehen, T. H.—Sec. and Treas. Pittsburg Automatic Vise & Tool Co., Wabash Bldg., Pittsburg, Pa.

Kehoe, E. J.—Pres. and Mgr. The E. J. Kehoe Co., Inc., 1659 Broadway, New York City.

Kehoe, E. J.—Sec. and Adv. Mgr. Continental Automobile Co., St. John and Olive Sts., New Haven, Conn.

Kehoe Co., Inc., The E. J.—1659 Broadway, New York City. (Continental, also motor trucks and light delivery cars.) Est. 1906. Cap., \$25,000. E. J. Kehoe, Pres. and Mgr.; T. W. Merseureau, Sec.; J. W. Merseureau, Treas.; R. C. Richardson, Asst. Mgr. Garage, 15 cars; repairing.

Keidel & Co., Henry.—Baltimore, Md. Mfrs. motors, gasoline marine.

Keim, H. B.—Esbon, Kan. (Autocar.)

Keim Mills, Inc., John R.—Kensington Ave. and Erie tracks, Buffalo, N. Y. Mfrs. brake drums, hubs, flanges, dust caps, brackets, discs and all kinds of cold pressed metal products. Cap., \$350,000. Est. 1890. Inc. 1906. John R. Lee, Pres.; S. S. Spaulding, Vice-Pres.; H. B. Spaulding, Treas.; E. G. Spaulding, Sec.; Wm. H. Smith, Gen. Mgr.

Keir, J. L.—310 N. Broad St., Philadelphia, Pa. (Renault.)

Keiser, Fred J.—Vice-Pres. and Supt. Spring Dept., Lewis Spring & Axle Co., Jackson, Mich.

Keiser, Henry.—Pres. Keiser Van Leer Co., 505-507 N. East St., Bloomington, Ill.

Keiser-Van Leer Co., The.—Bloomington, Ill. Office, 505-507 N. East St.; shops, 206-213 E. Market St. (Rambler.) Est. 1874. Inc. 1900. Cap., \$50,000. Henry Keiser, Pres.; E. N. Brown, Vice-Pres.; B. C. Van Leer, Sec., Treas. and head of Automobile and Supplies Dept. Garage, 10 cars; repairing.

Keith, B. B.—226 W. 5th St., Mansfield, O. (Pope-Waverley.)

Keith, Simmons & Co.—316 Union St., Nashville, Tenn. (Mitchell.)

Kellemen, J. F.—Vice-Pres. Utica Drop Forge & Tool Co., 75 Genesee St., Utica, N. Y.

Kelley & Co., E.—509 Main St., Worcester, Mass. Mfrs. seat springs.

Keller-Dorian, A.—89 bis, rue Dauphiné, Lyons, France. Mfrs. K. D. motorcycles.

Keller, J. M.—Nappanee, Ind. Garage.

Kelley Maus & Co.—1-5 W. Lake St., Chicago, Ill. Mfrs. metal trimmings.

Kelley, W. S.—Chief Engineer Holtzer-Cabot Electric Co., Brookline, Mass.

Kellner et ses fils.—125 Ave. Malakoff, Paris, France. Mfrs. bodies.

Kellock, S. K.—Sec. C. A. Duerr & Co., Inc.—2182-6 Broadway, New York City.

Kellog, Geo. S.—Builders' Exchange, Buffalo, N. Y. Mfr. steel.

Kellogg & Co., E. H.—243-244 South St., New York City. Mfrs. anti-corrosive

gas engine cylinder oil, Excelsior gear case compounds, automobile and motor boat oils and greases. Est. 1858.

Kellogg Garage Co.—Kellogg, Ia. Garage.

Kellogg, G. W.—9 Belmont St., Rochester, N. Y. Mfr. pump connections, (tire valve).

Kellom & Co., Chas. F.—128 Arch St., Philadelphia, Pa. Mfrs. automobile oils, lubricating compounds and semi-fluid compounds. Business est. by C. F. Kellom in 1881.

Kells, Amos M.—Gen. Mgr. Adrian Steel Casting Co., Beecher St., Adrian, Mich.

Kells Mfg. Co., W. J.—62 Van Winkle St., Jersey City, N. J. Mfrs. dashes and fenders, hoods, mufflers, radiators.

Kelly, Chas. F. U.—Continental Rubber Works, Erie, Pa. (Haynes.)

Kelly Handle Bar Co.—Cleveland, O. Mfrs. lamp brackets.

Kelly, J. B.—212 2d St., Portland, Ore. (White.)

Kelly, J. H.—Natchez, Miss. Garage.

Kelly, William.—Consulting Engineer and Director Wayne Automobile Co., Piquette and Brush Sts., Detroit, Mich.

Kelsey & Kelsey.—25 Hamilton St., Albany, N. Y. Vulcanizing.

Kelsey Co.—42 Niagara St., Buffalo, N. Y. Garage.

Kelsey Motor Car Co.—204 N. Broad St., Philadelphia, Pa. (Maxwell, Mors, Mora.)

Kelsey, R. F.—Editorial Dept., The Automobile, Flatiron Bldg., New York City.

Kelsey, R. G.—Sec., Treas., Gen. Mgr. and Director Dragon Motor Co., 31st and Chestnut Sts., Philadelphia, Pa.

Kemp, D. W.—129 W. 15th St., Minneapolis, Minn. (Earl.)

Kemp, E. A.—Greenville, Mich. (Jackson.)

Kemp Machine Works, J. N.—887 Main St., Albany, N. Y. Garage.

Kemp, W. S.—Treas. Holtzer-Cabot Electric Co., Brookline, Mass.

Kempsmith Mfg. Co.—Linus St. and Woodward Ave., Milwaukee, Wis. Mfrs. milling machines, plain milling machines, universal milling machines, milling cutters, attachments for milling machines.

Kenen, L. C.—Designer Dragon Motor Co., 31st and Chestnut Sts., Philadelphia, Pa.

Kendlen, Frank.—Pres. McCook Auto Co., 308 W. Dennison St., McCook, Neb.

Kendrick & Davis.—Lebanon, N. H. Mfrs. magnetos and ignition dynamos, electric motors.

Kennedy, Harold H.—Designer Pope Motor Car Co., 139 S. East St., Indianapolis, Ind.

Kennedy Paint Co.—Montgomery, Ala. (Reo.)

Kensington Garage.—712-14 Coney Island Ave., near Ave. D., Brooklyn, N. Y. Garage; renting; repairing; supplies.

Kensington Motor Boat Co., Ltd.—64 Avonmore Road, London, W., England. Mfrs. marine motors.

Kent, E. R.—1754 Welton St., Denver, Colo. Repairing.

Kent, M. H.—Kenosha, Wis. (Waltham.)

Kent, Morgan B.—998 Boylston St., Boston, Mass. (Hotchkiss, Stearns.)

Kent Spark Plug Co.—1279 Bedford Ave., Brooklyn, N. Y. 621 Broadway, New York City. Mfrs. spark plugs.

Kentucky Automobile Co.—1051 3d Ave., Louisville, Ky. (Cadillac, Peerless, Knox, Buick, Pope-Waverley. Est. 1901 (under another name). Inc. 1904. Cap., \$25,000. A. Levy, Pres.; Hubert Levy, Treas. and head of Sales Dept.; Ira S. Barnett, Sec. and head of Repairs and Sundries Dept. Garage, 20 cars. Complete repair shop.

Kenworthy, T.—Winchester, Ind. (Auburn.)

Kerbaugh, H. S.—Pres. Commercial Truck Co. of America, 1222 Arcade, Philadelphia, Pa.

Kerberg & Protexter.—Sandborn, Ia. Garage.

Kerf.—The cut or incision made by a saw.

Kermath Motor Car Co.—Detroit, Mich. Mfrs. gasoline automobiles.

Kern & Son.—Portland, N. D. Garage.

Kero-Steam Co. (Waite & Son Co.)—102 Fulton St., New York City. Factory, East Orange, N. J. Mfrs. gerosene burners, flash steam generators, Packingless throttle, starting torch (kerosene) for burners, blow torches, flash steam system accessories. Est. 1902. Henry Randall Waite, Pres. and Treas.; Winthrop Waite, Sec.

Kerosene.—That fraction of petroleum which boils between 300° and 500° F., and consists of paraffine hydrocarbons containing from 10 to 16 atoms of carbon. It is usually purified by shaking in succession with sulphuric acid and caustic soda, distilling it, and, for burning purposes, collecting the fraction coming over between the above temperatures. The flashing points at which an ignitable vapor is given off by heating will range from 115° F. to 125° F. The oil will itself ignite and burn when heated to between 130° and 140° F. This is called its "burning-point." (See Carburetter, and Motor.) Kerosene injected into a motor-cylinder through the priming-cup and allowed to remain therein a few hours will remove all deposit from the piston-head. It is also used for removing the gummy residue left on the piston and the cylinder-wall by the lubricating

oil, and likewise facilitates the starting of the motor in cold weather or after it has been standing idle for some time.

Kerosene Carburetter.—See Carburetter, Kerosene.

Kerosene Lamp.—See Lamp, Kerosene.

Kerosene Motor.—See Motor, Kerosene.

Kerr, I. N.—Main and Asbury Aves., Asbury Park, N. J. Garage.

Kerr, M. W.—571 S. Clinton St., Syracuse, N. Y. (Buick.)

Kerr, Robt.—Mgr. Torch Dept., The Turner Brass Works, Sycamore and Illinois Sts., Chicago, Ill.

Kerrigan, C.—Chief demonstrator Martini Import Co., 239 W. 50th St., New York City.

Kerrison, John Charles.—Newspaper writer. B. England, May 22, 1869. Ed. public school. Mem. Bay State, Director 1st Cavalry Ass'n., R. I. A. C., Mass. State A. A., Pres. Chronograph Club. Mem. Masonic bodies, Officer State Militia, A. A. A. Touring Board and Technical Committee. Res., Beachmont, Boston, Mass. Office, Summer St., Boston, Mass. Used first car in 1901.

Kessler, Alfred.—Treas. Daimler Mfg. Co., 939 Steinway Ave., Long Island City, N. Y.

Kessler Machine & Supply Co.—San Diego, Cal. (Maxwell.)

Kessler, Walter.—Pres. Indianapolis Drop Forging Co., Indianapolis, Ind.

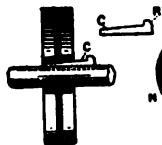
Ketchum & Co.—Bank and Sparks Sts., Ottawa, Ont., Canada. (Oldsmobile, Ford, Rolls-Royce.) Est. 1896. H. G. Ketchum, Mgr.; P. F. Shaver, Sales. Mgr.; W. H. Newington, Garage Mgr. Garage, 20 cars; repairing.

Ketchum, H. G.—Mgr. Ketchum & Co., Bank and Sparks Sts., Ottawa, Canada.

Ketchum, J. P.—60 Putnam St., Saratoga, N. Y. (Packard, Cadillac.) Garage.

Keveney, J. J.—Supt. of Foundry Hercules Float Works, 200 Franklin St., Springfield, Mass.

Key.—A rectangular piece of metal, C (see figure) fitted into slots, A, N, N, in a shaft and gear or wheel to hold them firmly in place. (2) A switch adapted for making and breaking an electric contact. (3) A tool used in turning a nut or other loose part of a machine.



(3) A tool used in turning a nut or other loose part of a machine.

Key.—The handle of a cock. See Cock.

Key-bed.—See Key-way.

Key-drift.—A steel punch, called also "key-driver," used for driving keys out of the key-seat.

Key-plug.—See Plug, Key.

Key-seat.—The same as Key-way, q. v.

Key, Screw.—The same as spanner, q. v. See Spanner.



Key-way.—A groove, C. C (see figure), called a "key-seat" and "key-bed," formed in a shaft or the hub of a wheel for the insertion of a key or tapered pin.

Keyes, John M.—8 Walden St., Concord, Mass. (Pope-Toledo, Stanley.) Est. 1895. Garage, 6 cars; repairing.

Keystone Auto & Cycle Co.—Titusville, Pa. (Pierce Arrow, Thomas, Stevens-Duryea, Buick, Franklin, Corbin.)

Keystone Auto Co.—5905 Center Ave., Pittsburgh, Pa. (Stoddard-Dayton, Welch, Ford, Columbus, White.)

Keystone Brass Foundry Co.—188 Berks St., Philadelphia, Pa. Mfrs. aluminum, brass, bronze and copper castings.

Keystone Drop Forge Co.—Chester, Pa. Mfrs. drop forgings.

Keystone Electrical Instrument Co.—9th St. and Montgomery Ave., Philadelphia, Pa. Mfrs. electrical instruments, ammeters, voltmeters. Est. 1893. J. F. Stevens, Pres.; G. W. W. Comman, Jr., Sec. and Treas.

Keystone Garage.—912 Bedford Ave., Brooklyn, N. Y. Garage.

Keystone Lubricating Co.—20th and Allegheny Aves., Philadelphia, Pa. Mfrs. grease.

Keystone Motor Car Co.—240 N. Broad St., Philadelphia, Pa. (Buick, Packard.)

Keystone Motor Car Co.—644 Telegraph Ave., Oakland, Cal. (Acme, Blomstrom.)

Keystone Motor Car Co.—1019 Market St., Harrisburg, Pa. (Rapid, Pullman, Maxwell.)

Keystone Spring Works, Inc.—13th and Buttonwood Sts., Philadelphia, Pa. Mfrs. leaf springs.

Keystone Supply Co.—Columbus, O. Mfrs. oils.

Keystone Wagon Works.—Reading, Pa. Mfrs. wood and metallic bodies, hoods, auto tops.

Kezin, H. E.—Asst. Mgr. Twentieth Century Motor Car Co., 121-25 Lafayette St., South Bend, Ind.

Khesrath, V.—588 Fordham Rd., New York City. Garage.

Kibbe, C. S.—Batavia, N. Y. Mfrs. wearing apparel, caps, gloves and gauntlets.

Kibbie, Geo. R.—Sec. Frank O. Renstrom Co., 424-446 Stanyan St., San Francisco, Cal.

Kiblinger Co., W. H.—Auburn, Ind. Mfrs. gasoline automobiles. (Kiblinger motor buggies.)

Kidder, H. F.—Elkhart, Ind. Garage.

Kid McCoy Motor Co.—New York City. Garage. Cap., \$40,000. Incorpora-

tors, Norman Selby, J. P. Gozman, H. H. Selby.

Kidney & Son, Dan.—West De Pere, Wis. Mfrs motor boats.

Kiefer's Sons, Henry.—New Hyde Park, N. Y. (Reo.)

Kiel, Wilhelm.—30 rue Beaubourg, Paris, France. Mfrs. low tension magnetos.

Kieme, J. S.—Sec. and Treas. Riverside Steel Casting Co., 451-473 Riverside Ave., Newark, N. J.

Kieme, P. S.—Vice-Pres. Riverside Steel Casting Co., 451-473 Riverside Ave., Newark, N. J.

Kieser, J. L.—Treas. The Walter Auto Co., Trenton, N. J., and 59-61 W. 66th St., New York City.

Kilborn & Bishop Co., The.—Lloyd and Chapel Sts., New Haven, Conn. Mfrs. forged hardware and drop forgings to order, including wrenches, pliers, expansion bits, chisels, etc. Cap., \$15,000. Est. 1896. G. A. Kilborn, Pres.; E. R. Bishop, Sec. and Treas.

Kilborn, G. A.—Pres. The Kilborn & Bishop Co., Lloyd and Chapel Sts., New Haven, Conn.

Kilburn, Edwin.—Spring Valley, Minn. Mfrs. body irons, feed water heaters, boiler pumps, steam engines.

Kilgore, Fred'k O.—Supt. Kilgore Mfg. Co., 101 Main St., Old Town, Me.

Kilgore Mfg. Co.—101 Main St., Old Town, Me. Mfrs. pneumatic shock eliminators for automobiles. Mem. M. & A. M. Cap. paid in, \$40,000. Est. Feb., 1907. Herbert Gray, Pres.; Geo. H. Richardson, Treas.; Fred'k O. Kilgore, Supt.

Killam, Henry.—Chestnut and Wooster Sts., New Haven, Conn. Mfr. wood and metallic bodies.

Killed Spirits.—A solution of zinc chloride used in soldering.

Killian's Garage.—Tompkinsville, Staten Island, N. Y. Garage.

Killian, J. D.—Mgr. Killian's Garage, Tompkinsville, Staten Island, N. Y.

Killip, Oscar.—150 S. State St., Elgin, Ill. (Jackson.)

Killum, Walter.—Supt. Chase Motor Truck Co., Syracuse, N. Y.

Kilo.—A prefix indicating that the word that it precedes is multiplied by 1,000, as one kilometre = 1000 metres. The word is commonly but incorrectly used as a synonym of "kilogramme."

Kilogramme.—(Abbrev. kg.) A weight of 1000 grammes. The "international kilogramme" is a certain platino-iridium bar termed the "kilogramme des archives." A kilogramme equals 2.67 troy pounds, or 2.2 pounds avoirdupois.

Kilogramme-metre.—(Abbrev. kgm.) Unit of work. It represents the work necessary to raise a kilogramme to the

height of one metre, regardless of the time. It is equal to 7.25 foot-pounds.

Kilowatt.—Unit of power used in electrotechnics. The power of all electric machines is estimated in kilowatts, just as that of mechanical machines is estimated in horse-power. 1 kilowatt = 1.36 horse-power (French).

One kilowatt = 1000 watts; an engine giving 500 amperes at 50 volts is an engine of 25 kilowatts.

Kilpatrick, A. J.—Lebanon, Pa. (Maxwell.)

Kimball & Co., C. P.—315-318 Michigan Ave., Chicago, Ill. Mfrs. limousine, phaeton, landaulet, touring and runabout bodies for automobiles. Dealers in electric carriages. (Rauch & Lang.) Repairing. Cap., \$250,000. Est. 1877. Chas. F. Kimball, Pres. and Treas.; F. A. B. Smith, Sec.; Donald G. McDiarmid, head of Construction Dept.; Robt. C. Irwin, head of Repair Dept.

Kimball, Chas. A.—Pres. and Treas. C. P. Kimball & Co., 315-318 Michigan Ave., Chicago, Ill.

Kimball Co., E. T.—Motor Mart, Boston, Mass. Mfrs. acetylene generators.

Kimball, L. M.—Arkansas City, Kan. (Waltham.)

Kimball, R. R.—2026 Farnum St., Omaha, Neb. (Stanley, Stevens-Duryea.)

Kimball Tire Case Co.—Council Bluffs, Ia. Mfrs. tire cases, tire shoes and tire treads.

Kimball, W. J.—Vice-Pres. N. Y. & N. J. Lubricants Co., 14-16 Church St., New York City.

Kimbark, G. C.—Cashier Timken Roller Bearing Axle Co., Canton, O.

Kimberly, Ralph.—Sec. and Treas. National Battery Co., Buffalo, N. Y.

Kinematics.—The part of science which deals with motion considered per se and without reference either to the force producing it or to the body moved.

Kinetic Energy.—See Energy, Electric.

King, A. A.—Lake Hopatcong, N. J. (Ford.) Est. 1905. Capt. Frank Goodwin, Chief of Marine Dept.; R. Henderson, Asst. Chief Marine Dept. Garage, 30 cars; repairing in all branches.

King, B. F.—Austin, Minn. (Columbia.)

King, Chas. H.—Bridgewater, Mass. (Maxwell.)

King, F. B.—Supt. National Spring & Wire Co., Albion, Mich.

King Garage Co.—87½ W. Main St., Springfield, O. (Cadillac.)

King Optical Co., Julius.—10-12 Maiden Lane, New York City; State and Madison Sts., Chicago, Ill.; Erie and Sheriff Sts., Cleveland, O. Mfrs. goggles and eye shields.

King-Platt Auto Co.—Cooperstown, N. D. (Rambler, Reo, Queen.)

King, Russell G.—Easton, Pa. (Jackson.)

King Top Mfg. Co.—Dayton, O. Mfrs. outo tops.

King, W. H.—Wilton, Me. (Holsman.)

King, W. P.—Mgr. Buffalo Plant, Allyn Brass Foundry Co., Cleveland, Detroit and Buffalo.

Kingman, J. A.—Adv. Mgr. Locomobile Co. of America, Main St., Bridgeport, Conn.

King's Beach Garage.—Swampscott, Mass.; Lynn, Mass. (Glide.) Garage.

Kingsbridge Garage.—W. 230th St., near Broadway, New York City. Second-hand dealers.

Kingsbury, J. G.—Pres. and Treas. The Grant Mfg. & Machine Co., 90 Silliman St., Bridgeport, Conn.

Kingsbury, John.—133 Hudson Ave., Albany, N. Y. Garage.

Kings County Automobile Co.—1011 Greene Ave., Brooklyn, N. Y. Garage.

Kingston Garage & Motor Car Co.—Kingston, Pa. Garage.

Kingston Garage.—Grand and Prince Sts., Kingston, N. Y. (Rambler, Ford.)

Kingston, Geo.—Gen. Mgr. Kokomo Electric Co., Pres. Byrne, Kingston & Co., 339-351 Smith St., Kokomo, Ind.

Kingston Truck & Bolt Co.—Kingston, N. Y. Mfrs. drop forgings.

Kinney & Alexander.—Binghamton, N. Y. (Holsman.)

Kinnucan, A. J.—Pur. Agt. Brush Runabout Co., 14-16 Baltimore Ave. W., Detroit, Mich.

Kinports Auto Co., M.—Ephrata, Pa., and 126 E. Orange St., Lancaster, Pa. (Ford.)

Kinsey & Dobbins.—Highland, N. J., and 129 Riverside Ave., Newark, N. J. Garage.

Kinsey & Mahler Co.—400 S. Adams St., Peoria, Ill. Brass foundry and jobbers, pipe, fittings, etc. Cap., \$150,000. Est 1850. S. A. Kinsey, Pres.; Warren Kinsey, Sec.; E. L. Wilson, Treas.

Kinsey Mfg. Co.—Dayton, O. Mfrs. battery boxes, dashes and fenders, pressed steel frames, hoods, mufflers, lubricators.

Kinsey, S. A.—Pres. Kinsey & Mahler Co., 400 S. Adams St., Peoria, Ill.

Kinsey, Warren.—Sec. Kinsey & Mahler Co., 400 S. Adams St., Peoria, Ill.

Kinsler-Bennett Co.—62 Market St., Hartford, Conn. Mfrs. universal joints.

Kinsley Auto Co.—Kinsley, Kan. Garage.

Kinsman, B. T.—Sec. Gearless Transmission Co., Rochester, N. Y.

Kintzing, W. F.—Sec. Treas. and Gen. Supt. Heindel Mfg. Co., Hanover, Pa.

Kirchberger & Co.—50 Warren St., New York City. Mfrs. gas lamp burners.

Kirchdorfer, J. C.—Pres. Kirchdorfer Auto Co., 1700-1702 Baxter Ave., Louisville, Ky.

Kirchdorfer Automobile Co.—1700-1702 Baxter Ave., Louisville, Ky. (Reo, Premier.) Est. Feb. 1, 1906. Cap., \$20,000. J. C. Kirchdorfer, Pres.; W. H. Fritts, Vice-Pres.; H. T. Gratz, Sec. Treas and Mgr. Garage, 20 cars; repairing.

Kirchhoff & Cook.—Hampshire, Ill. (Rambler.)

Kirk & Co., J. S.—360 N. Water St., Chicago, Ill. Mfrs. laundry and toilet soaps, glycerine soap for automobiles. Cap., \$1,500,000. Est. 1839. Milton W. Kirk, Pres.; E. G. Holloway, Vice-Pres.; George Schraeder, Sec.; Jacob L. Oestmann, Treas.

Kirk Bros. Auto Co.—915 Jefferson Ave., Toledo, O. (Buick, Thomas, Studenbaker.)

Kirk, Ezra Elmer.—Pres. The Rainier Motor Car Co. of Illinois, Western mgr.

of sales Rainier Motor Car Co. of New York. B. Toledo, O., July 9, 1861. Ed. graduate high school. Director Rainier Motor Car Co. of Ill. Mem. East Saginaw, Toledo, A. C. of Buffalo, Cleveland A. C., Toledo A. C., Inverness, Res., Toledo, O. Office, 915 Jefferson Ave., Toledo, O., 1725 Michigan Ave., Chicago, Ill. In the trade since 1901. Recreations: Motoring, yachting, golf.

Kirkendale, G. A.—Mgr. Architectural Dept. Glidden Varnish Co., Rockefeller Bldg., Cleveland, O.

Kirkham, I. C.—Fulton St. and Bedford Ave., Brooklyn, N. Y. (Maxwell.)

Kirkham Motor Mfg. Co.—Bath, N. Y. Mfrs. clutches, transmission gears, gasoline automobile motors.

Kirkland, H. M.—Vice-Pres. and Treas. La France Motor Co., 753 5th Ave., New York City.

Kirk Latty Co.—Cleveland, O. Mfrs. bolts, nuts, screws.

Kirk, Milton W.—Pres. J. S. Kirk & Co., 360 N. Water St., Chicago, Ill.

Kirkpatrick, J. R.—Pres. Victor Auto Storage Co., 147-149 W. 55th St., New York City.

Kirkpatrick, L. B.—Rochester, N. Y. (Holsman.)

Kirkpatrick, W. H.—Sales Mgr. Peerless Motor Car Co., 93d and Quincy Ave., Cleveland, O.

Kiser, Earl.—Mgr. Pittsburg Branch Winton Motor Carriage Co., Pittsburg, Pa.



Kish.—A term for the carbon which separates from melted pig iron when silicon or highly silicious iron is added to it.

Kiss-spark.—See Ignition.

Kissel, G. A.—Sec., Treas., Gen. Mgr., Pur. Agt., Sales and Advt. Mgr. Kissell Motor Car Co., Hartford, Wis.

Kissel Motor Car Co.—Hartford, Wis. Makers of the Kisselkar; first marketed, 1905. Five models made since. Cap. \$1,000,000. H. K. Butterfield, Pres.; V. P. Kissel, Vice-Pres.; G. A. Kissel, Sec., Treas., Designer, Gen. Mgr. and Purch. Agt. J. A. Tarkington, Supt.

Kissel, O. P.—Vice-Pres. Kissel Motor Car Co., Hartford, Wis.

Kit.—A name for a set of tools for any purpose, and also for the case which contains them.

Kitchen, W. A.—New Market, Ia. (Holsman.)

Kittridge, Lewis Harris.—Pres. Peer-



less Motor Car Co. B. Harrisville, N. H., June 18, 1874, Ed. graduate of high school, Keane, N. H., and New Hampshire State College, Durham, N. H. Mem. Clifton, Century, Cleveland A. C. A. C. A. Res., 1851 Craw-

ford Road. Office, Quincy Ave. and 93rd St., Cleveland, O.

Kitts & Son, E. A.—Corning, N. Y. (Jackson.)

Kitzmiller & Voorhees.—Flora, Ind. (Jewel.)

Kitsee Storage Battery Co.—Wilkes-barre, Pa. Mfrs. storage batteries. Eban L. Bevan, Gen. Sales Agt., 699 Connell Bldg., Scranton, Pa.

Kitson, T. J.—Treas. Stone Automobile Co., Inc., 1006 Main St., Stroudsburg, Pa.

Kitts Mfg. Co.—111-115 Water St., Oswego, N. Y. Mfrs. water alarms and columns.

Klaas und Sachtleben.—Magdeburg, Germany. Mfrs. coils.

Klaiss, H. P.—123 E. Market St., Tiffin, O. Repairing.

Klärner, Arthur.—12 Elisenstrasse, Leipsig, Germany. Mfr. tire pumps.

Klauder, Chas. L.—B. St. and Allegheny Ave., Philadelphia, Pa. Mfr. leathers.

Klauder, Francis.—Philadelphia, Pa. (C. G. V.)

Klein, F. A.—Vice-Pres. and Sec. M. E. Blasier Mfg. Co., 65 Columbia St., Utica, N. Y.

Klenzene Co.—1710 Market St., Philadelphia, Pa. Mfrs. automobile body soaps and polishes.

Klepp, W.—54 Blvd. Richard-Lenoir, Paris, France. Mfr. gauges.

Kley, Edouard.—18 rue Defacqz, Brussels, Belgium. Mfr. pneumatic tires.

Klickier, Frank.—Bath, N. Y. Garage.

Kline, Chas.—Designer Forest City Motor Car Co., 101-149 Walnut St., Massillon, O.

Kline Co.—1610 Michigan Ave., Chicago, Ill. (English and American Napier.)

Kline, J. A.—Treas., Gen. Mgr. and Designer York Motor Car Co., 240 N. George St., York, Pa.

Klinger, A.—Coldwater, Mich. (Winton.)

Klink Motor Car Mfg. Co.—Dansville, N. Y. Mfrs. gasoline automobiles.

Kloppel, C. O.—Leigh, Neb. (Waltham.)

Knaf, W. M.—Coshocton, O. Garage.

Knapp, E. J.—Pres., Treas. and Gen. Mgr. Northwestern Storage Battery Co., 448 Milwaukee St., Milwaukee, Wis.

Knapp et Cie, Georgia.—90 rue de Preize, Troyes, France. Mfrs. motorcycles.

Knapp, J. H.—Vice-Pres. Northwestern Storage Battery Co., 448 Milwaukee St., Milwaukee, Wis.

Knapp Mfg. Co.—2529 Polk St., N. E., Minneapolis, Minn. Mfrs. body irons.

Knauth, Wm.—Treas. Continental Caoutchouc Co., 43 Warren St., 2100 Broadway, New York City.

Kneale & Kneale.—Brookston, Ind. (Waltham.) Est. 1905. J. H. Kneale, Gen. Mgr.

Kneale, J. H.—Gen. Mgr. Kneale & Kneale, Brookston, Ind.

Knease, Henry.—Iowa City, Ia. (Rambler.)

Knee.—An elbow-joint or toggle-joint. See Joint, Toggle.

Knepper, H. H.—Mgr. Frayer-Miller Co., 62d St. and Broadway, Motor Mart, New York City.

Knickerbocker Auto Co.—253 W. 64th St., New York City. Garage.

Knickerbocker Garage.—Hot Springs, N. Y. Cap. \$60,000. Incorporators, H. V. Palmer, A. P. Palmer and C. A. Singer. Garage.

Knife.—In the old Panhard and Bollé carriages a "hit-or-miss" regulating device, one of the extremities of which was shaped like a knife-blade. This "knife," as it was called, opened or closed the exhaust-valve according as to whether it was or was not struck by a "hammer," the intermittent action of which was regulated by centrifugal force.

Knife-jack.—See Jack.

Knife-switch.—See Switch, Knife.

Knight & Kilbourne.—1240 Michigan

Ave., Chicago, Ill. Mfrs. gasoline automobiles. (Silent Knight cars.)

Knight & Co., D. C.—1725 Michigan Ave., Chicago, Ill. Mfrs. folding glass fronts.

Knight, H. A.—1911 Page St., San Francisco, Cal. (Austin.)

Knight, Harry A.—Sec. and Treas. Standard Auto Supply & Mfg. Co., 20 Broad St., New York City.

Knight, Jacob.—Garwin, Ia. (Wal-tham.)

Knight, J. W.—Treas. Columbia Lubri-cants Co. of New York, 78 Broad St., New York City.

Knight, Octavius.—Pres. Standard Auto Supply & Mfg. Co., 20 Broad St., New York City.

Knight's Central Station.—261 George St., New Haven, Conn. (Ford.)

Knoblock-Heideman Mfg. Co.—South Bend, Ind. Mfrs and jobbers igniting dynamos and magnetos, spark coils, bat-tery switches, spark plugs, ammeters, mufflers, carburettors, wire battery con-nectors. Cap., \$20,000. Est. 1898. Otto M. Knoblock, Pres.; Wm. H. Miller, Vice-Pres.; George H. Heideman, Sec., Treas. and Mgr.

Knoblock, Otto M.—Pres. Knoblock-Heideman Mfg. Co., South Bend, Ind.

Knocking.—A sharp sound heard in an engine, due to a loose part and occur-ring almost always at the beginning of the compression stroke and again at the beginning of the exhaust stroke. See Pounding.

Knohaert.—Frelinghien, Nord, France. Mfrs. shock absorbers.

Knot.—A division of the "log-line" equalling one nautical mile, or 6,080 feet. The regulation "log-glass" runs 28 sec-onds. Then as 3,600 seconds: 28 seconds:: 6,080 feet: 47 feet 3 inches, the "knot" is 47 feet 3 inches on the log-line, and every knot paid out corresponds to one nau-tical mile per hour made by the boat. Thus, for example, six knots paid out in 28 seconds is equal to a speed of six miles an hour.

The "knot" is a unit of speed and not of length. It is the speed of a nautical mile per hour. The expression "knots per hour" is therefore incorrect.

The log-line should always be wet be-fore remeasuring. The following marks are used: One knot at every half knot; a piece of leather at the first knot; two knots at two knots; three knots at three knots, etc. The log should always be hove to leeward, and so that it shall strike the water perpendicularly.

To find the speed of a boat traveling over a measured course in a measured

time: If the course is a feet, and the time b seconds, then

$$\frac{3600 \times a}{b \times 5280} = \text{statute miles per hour; or}$$

$$\frac{3600 \times a}{b \times 6080} = \text{knots, or nautical miles per hour.}$$

Knowalsky, J.—Verona, Pa.; Pittsburg, Pa. (Gale.) Garage.

Knowles, C. S.—7 Arch St., Boston, Mass. Mfr. collapsible buckets.

Knowles, W. H.—Fulton and Jackson Sts., Ottawa, Ill. (Locomobile.)

Knowlson & M'Conihe.—65 River St., Troy, N. Y. Mfrs. water line gauges.

Knowlton, E. C.—Sacketts Harbor, N. Y. (Waltham.)

Knox Auto Co. of Ill.—1208 Michigan Ave., Chicago, Ill. (Knox.) Est. 1906 under present title. Cap., \$5,000. G. W. Bennett, Pres.; E. L. Harpham, Sec. and Treas. Repairing.

Knox Automobile Agency.—31 Mc-Graw Bldg., Detroit, Mich. (Knox.)

Knox Automobile Co.—1595 Broadway, New York City. (Knox.)

Knox Automobile Co.—53 Wilberham St., Springfield, Mass. (Knox.)

Knox Automobile Co.—53 Wilbraham Rd., Springfield, Mass. Makers of the Knox car; first marketed October, 1900. Ten models made since. Cap. \$363,000. E. H. Cutler, Pres.; W. E. Wright, Vice-Pres. and Sales Mgr.; A. E. Smith, Treas.; H. G. Farr, Sec. and Supt.; J. H. Jones, Designer; J. M. Collins, Purch. Agt.; H. M. Davis, Mgr. New York branch. Agents and dealers: Asheville Cycle & Auto Co., Asheville, N. C. Au-tomobile & Supply Co., Toronto, Can. Billings, Frank, Worcester, Mass. Bing-hampton Motor Car Co., Binghampton, N. Y. Foss-Hughes Motor Car Co., Providence, R. I. Broadway Automobile Co., Seattle, Wash. Caulkins & Co., F. L., Middletown, Conn. Clark Auto Co., E. R., Brattleboro, Vt. Close Bros., Schenectady, N. Y. Consolidated Wag-on & Machine Co., Salt Lake City, Utah. Covey, H. M., Portland, Ore. Ellis Mo-tor Car Co., Newark, N. J. Greenwood Brothers & Co., Gardner, Mass. Hale, E. T., New Haven, Conn. Hawkins, Chas. T., Erie, Pa. The Portland Co., Portland, Me. Insular Auto Co., San Juan, P. R. Johnston, Robert, Wilkes Barre, Pa. Kentucky Automobile Co., Louisville, Ky. Knox Automobile Co. of Ill., Chicago, Ill. Foss-Hughes Motor Car Co., Philadelphia, Pa. Martin, W. E., Bethlehem, Pa. Miner Garage Co., Hartford Conn. Mobile Carriage Co., San Francisco, Cal. Mohawk Valley Automobile Co., Albany, N. Y. My-ronda Motor Car Co., St. Louis, Mo. Queen City Auto Co., Cincinnati, O. Reed Underhill Co., Boston, Mass.

Schenley Automobile Co., Pittsburg, Pa. Tamblin, J. H., Dr., Copenhagen, N. Y. Townsend, A. R., Brooklyn, N. Y. Vanstone, C. W., Bridgeport, Conn. Western Motor Car Co., Sturgis, Mich. Wilson Automobile Co., Montreal, Canada. Crome-Graham Motor Car Co., Portland, Ore. Acme Garage Co., Tacoma, Wash.



Knox, Harry Austin.—Pres. and Mgr. Atlas Motor Car Co. B. Westfield, Mass., Jan. 19, 1875. Ed. Springfield high school, graduate of Springfield Industrial Institute. Director Atlas Motor Car Co. Res., 4 Dorchester St. Office, Birnie Ave., Springfield, Mass.

In automobile trade since 1896. Used first car, 1897.

Knox Co., The Frank J.—Hartford, Conn. Mfrs. water column mirrors.

Knuckle-joint.—See Joint, Knuckle.

Knudsen, Carl Frederik Albert.—Knoengsgade, Odense, Denmark. Mfrs. motorcycles.

Knudsen, Karsten.—Designer and Supt. Couplegear Freight Wheel Co., Ashton, Bldg., Grand Rapids, Mich. Designer Holson Motor Patents Co., Pythian Temple, Grand Rapids, Mich.

Knurled Nut.—See Nut. Milled.

Knurling.—A series of indentations or grooves, often improperly called "milling" or "reeding" on the edge of a nut, screw, etc., to facilitate turning with the fingers.

Knyff, René de.—31 Rue Demours, Paris. B. at Antwerp, Belgium, Dec. 10, 1865.



Chevalier of the Legion of Honor. Mgr. of the Panhard and Le Vasseur establishment. President of the Sporting Committee of A. C. F. M. de Knyff was one of the first apostles of mechanical locomotion on common roads, and one of its most distinguished devotees.

Koch, E. J.—Vice-Pres. Davis Mfg. Co., Milwaukee, Wis.

Koch, Frederick.—Prop. Eastern Exchange, 87 Orange St., Newark, N. J.

Koehler Co., H. J.—1709 Broadway, New York City. (Buick.) Garage.

Koehler, Herman J.—Pres. and Treas.

Koehler Sporting Goods Co., 845 Broad St., Newark, N. J.

Koehler Sporting Goods Co.—845 Broad St., Newark, N. J.; 43 Harrison St., East Orange, N. J.; 371 Bloomfield Ave., Montclair, N. J.; 185 Paterson St., Paterson, N. J. (Buick, Corbin, Pope-Waverley, Indian.) Est. 1895. Herman J. Koehler, Pres. and Treas.; W. A. Koehler, Sec.; F. G. Benson, Gen. Mgr. Repairing; supplies; storage.

Koehler, W. A.—Sec. Koehler Sporting Goods Co., 845 Broad St., Newark, N. J.

Koen, James R.—1257 Niagara St., Buffalo, N. Y. Mfr. wood and metallic bodies.

Koener Accumulator Co.—420 Wabash Ave., Chicago, Ill. Mfrs. ignition and power batteries; charging; repairing; supplies.

Koenig Bros.—Broadway, bet. Central Ave. and Main St., Tarrytown, N. Y. (Reo, Premier.) Garage; repairing; supplies.

Koerting, Gebrüder.—Koertingsdorf, Hanover, Germany. Mfrs. automobile motors.

Kohler und Co., Otto.—Bülowsstrasse 57, Berlin, Germany. Mfrs. make and break plugs.

Kohout und Co.—40 Warwastrasse, Brunn Moravia, Austria. Mfrs. motorcycles.

Kokal, Edward.—Chief Chemist Universal Electric Storage Battery Co., Offices, 108 La Salle St.; factory, 36-38 Union Park Pl., Chicago, Ill.

Kokomo Auto & Machine Co.—44 W. Mulberry St., Kokomo, Ind. Garage

Kokomo Brass Works.—351 N. Smith St., Kokomo, Ind. Mfrs. brass, bronze, aluminum and copper castings.

Kokomo Electric Co.—339 Smith St., Kokomo, Ind. Mfrs. coils, plugs, timers and switches. Mem. M. & A. M. Cap. \$25,000. Est. 1904. C. T. Byrne, Pres.; J. F. Ryan, Vice-Pres.; J. W. Johnson, Treas.; J. P. Grace, Sec.; Geo. Kingston, Gen. Mgr.

Kokomo Rubber Co.—Kokomo, Ind. Mfrs. pneumatic tires, solid tires.

Kolb, Chas. Edouard.—18 Place de la Chapelle, Paris, France. Mfr. automobile motors.

Koller Hardware Co.—Ponca City, Okla. (Waltham.)

Koller, H. O.—Sec., Treas. and Gen. Mgr. Reading Automobile Co., 26 S. 5th St., Reading, Pa.

Köln-Lindenthaler Metallwerke Aktien Gesellschaft.—Krief-Köln, Germany. Mfrs. motorcycles.

Komarek.—55 Quellengasse, Vienna, Austria. Mfrs. steam commercial automobiles.

Kometwerke Actiengesellschaft.—Dresden, Germany. Mfrs. motor cycles. (Komet motorcycles.)

Komp, Frederick—Treas. The Chelsea Auto Storage Co., 516-520 W. 37th St., New York City.

König, H.—Schönewörde bei Knesbeck, Germany. Mfrs. bodies.

Konigslow, M. E.—Mgr. Otto Konigslow Mfg. Co., 2279 Clarkwood Road, Cleveland, O.

Konigslow Mfg. Co., Otto.—2279 Clarkwood Road, Cleveland, O. Machine work to order, metal work to order, pressed and stamped parts, brazing and forming tubing, steering gears, pumps, carburetters, brakes, exhaust headers, intake pipes. Not inc. Otto Konigslow, Prop.; M. E. Konigslow, Mgr.

Konigslow, Otto.—Prop. Otto Konigslow Mfg. Co., 227-9 Clarkwood Road, Cleveland, O.

Körtings Slepner Motoren.—60 Badentstetersn, Hanover, Germany. Mfrs. marine and automobile motors.

Koven & Bros., L. O.—50 Cliff St., New York City. Mfrs. tanks.

Knowalsky Engine Co., The J.—Grant St. and Railroad Ave., Verona, Pa. Mfrs. marine and stationary gas and gasoline engines. Cap., \$50,000. Est. since 1902. Inc. 1906. H. Miller, Pres. and Gen. Mgr.; R. Miller, Jr., Vice-Pres. and Treas.; G. E. Flaccus, Sec.

Koyt, A. B.—Newton, N. J. (Holsman.)

Kraemer, C.—758 E. 140th St., New York City. Garage.

Kraft & Co., E. L.—241 S. George St., York, Pa. (Maxwell.)

Kraft, Victor S.—44 N. Water St., Rochester, N. Y. (Monarch.)

Kraftzeng-Werke Gesellschaft.—Brandenburg, Germany. Mfrs. steam automobiles. (Dampf cars.)

Kramer-Allen Motor Co.—227 S. Perry St., Attica, Ind. (Winton, Thoroughbred and Marsh motorcycles.)

Kramer & Co., Wm. F.—Canal St., Dayton, O. Mfrs. automobile tops.

Kramer & Wroten.—St. Julian St. W., Savannah, Ga. (Studebaker.)

Kramrath, H.—25 Plain St., Albany, N. Y. Garage.

Krarup, Marius Christian.—Automobile Engineer. Born Denmark, July 21, 1857. Ed. College. University (Law course), Institute of Technology, Military high school (engineering studies). Editor Motor Age, 1898-99; Automobile Topics, 1901-02; The Automobile, 1903-04; Power Wagon, 1906. Contributor to magazines. Res., 139 E. 53rd St., New York City.

Kratzer, Wayne.—1172 5th Ave., New York City. Garage.

Krause, B.—Pres. Globe Machine & Stamping Co., 3868 Hamilton Ave., N. E., Cleveland, O.

Krause, R. E.—8612 Wade Park Ave., Cleveland, O. Mfr. Carburetters.

Krauss, Chas.—1406 Oxford St., Philadelphia, Pa. (Indian.)

Krebs, Constantine.—19 Ave. d'Ivry, Paris. Officer of the Legion of Honor. Manager of the old establishments of Panhard and Levassor. Made himself known about 1888 by some remarkable experiments in ballooning in co-operation with Col. Renard.

Kreidler Bros.—214 State St., Olean, N. Y. (Cadillac, Winton.)

Krembs & Co.—55 Waldo Pl., Chicago, Ill. Mfrs. brazing compound, drill compound, weld compound. Est. 1875. Walter R. Krembs, Mgr.

Krembs, Walter R.—Mgr. Krembs & Co., 55 Waldo Pl., Chicago, Ill.

Krenning, H. B.—Gen. Mgr., Pur. Agt. and Pres. Dorris Motor Car Co., 22-38 S. Sarah St., St. Louis, Mo.

Krider, J. A.—Sales Mgr. Cleveland Cap Screw Co., 2216 Clarkwood Road, Cleveland, O.

Krieger Automobil Aktiengesellschaft.—131 Wilhelmstrasse, Berlin, Germany. Mfrs. electric automobiles. (Krieger cars.)

Kriner, J. J.—Chambersburg, Pa. (Jewel.)

Kroh Mfg. Co., C. Z.—Toledo, O. Mfrs. storm aprons and curtains, automobile tops, cloth and carpet trimmings.

Kroner, J. C.—1433 Main St., La Crosse, Wis. (Maxwell.)

Kronmeyer, Wm.—Murphysboro, Ill. (Pope-Hartford.)

Kronprinz Aktiengesellschaft.—Ohligs, Germany. Mfrs. metallic rims.

Kruesi, P. J.—Sec., Treas. and Gen. Mgr. American Lava Co., 27-33 William St., Chattanooga, Tenn.

Krueger Auto Co.—Milwaukee, Wis. (Eclipse, Premier.)

Krueger Automobile Co.—233 Main St., Oshkosh, Wis., and Lawrence St., Appleton, Wis. (Buick, Winton, Pope-Hartford.)

Krupp, Friedrich.—Essen, Germany. Mfrs. pressed steel frames.

Kruse, Gebrüder.—66 Dorotheenstrasse, Hamburg, Germany. Mfrs. steam commercial automobiles, electric commercial automobiles. (Trucks.)

Kugelfabrik Fischer Aktiengesellschaft—Schweinfürth, Germany. Mfrs. ball bearings.

Kuhlmann, Wm.—Boerne, Tex. Garage.

Kull, Albert L.—Sales Mgr. Dragon Automobile Co. B. St. Louis, Mo., Aug. 16, 1864. Ed. public school. Director Dragon Automobile Co. Mem. N. Y. Motor, Quaker City Motor. Res., 83 Liberty Ave., New Rochelle, N. Y. Office, 1677 Broadway, New York City. In automobile trade since 1896.

Kull Auto Co., A. L.—1677 Broadway, New York City. (Dragon.) Garage.

Kundtz, Theo.—Cleveland, O. Mfr. wood and metallic bodies, spark coil boxes.

Kunkle & Co., E.—Garfield, N. J. Garage.

Kunze und Co.—Gros-Zschachwitz, Dresden, Germany. Mfrs. automobile motors.

Kupel Co., H. L.—912 Tacoma Bldg., Chicago, Ill. Mfrs. gasoline automobiles.

Kupel, J. M.—Supt. The Bartholomew Co., Peoria, Ill.

Kurtz, J. A.—Pres. Hercules Electric Co., Indianapolis, Ind.

Kurtz, S. H.—Sec. and Mgr. Hercules Electric Co., Indianapolis, Ind.

Kuser, Fred.—Pres. Walter Auto Co.,

Trenton, N. J., and 59-61 W. 66th St., New York City.

Kuser, Jno. L.—Treas. Motor Car Specialty Co., 112 N. Broad St., Philadelphia, Pa.

Kuser, R. V.—Asst. Treas. Walter Auto Co., 59-61 W. 66th St., New York City, and Trenton, N. J.

Kusterer, C. C.—Mgr. Auto Rail & Equipment Co., 113 Michigan Trust Bldg., Grand Rapids, Mich.

Küsterman, Gebrüder.—Usedomstrasse 21, Berlin, Germany. Mfrs. wood wheels.

Kutzkau, H. T.—Tonopah, Nev. (Simplex, Isotta-Fraschini, Thomas, Oldsmobile.) Est. 1904. Garage, 20 cars; repairing.

Kyte, H. W.—Second Vice-Pres. and Sales Mgr. Electric Vehicle Co., 1 Laurel St., Hartford, Conn.

L

L—Symbol for "latent heat"; for "liter"; and for "co-efficient of induction."

La Belle Iron Works.—Steubenville, O. Mfrs. sheet iron and steel, wrought iron and steel pipe.

Labitte, E.—7 rue Bordier, Aubervilliers, France. Mfr. spark plugs.

Labourdette, Henri.—35 ave. des Champs Elysées, Paris, France. Mfr. bodies.

La Buire Import Co.—1964 Broadway, New York City. (De La Buire.)

Lace, Chas. A.—Head of Advt. and Pur. Dept. Bowen Mfg. Co., Canal St., Auburn, N. Y.

Lackawanna Leather Co.—Hackettstown, N. J. Mfrs. leather.

Lackawanna Mfg. Co.—Newburg, N. Y. Mfrs. gasoline marine motors.

Lackawanna Motor Car.—Scranton, Pa. (Winton.)

Lackawanna Steel Co.—Hamburg Turnpike and Ridge Rd., Buffalo, N. Y. Mfrs. steel.

Laclaverie et Gaches.—9 rue Montrosier, Neuilly-sur-Seine, France. Mfrs. bodies.

Lacoin, Louis Paul.—8 Rue François Millet, Paris. Born at Arcachon, March 2, 1865, Engineer of Arts and Manufactures, and former manager of forges and foundries. He spent many years in the steel works of Longwy, and then in the works of de Dietrich at Luneville. He is a member of the staff of Omnia, and the inventor of a dismountable chassis for automobiles.

Lacon Auto Co.—Lacon, Ill. (National.)

La Conqueté de l'Air.—Brussels, Belgium. Aeronautical Magazine.

Lacoste et Battman.—15 rue Danton, Levallois, Paris, France. Mfrs. gasoline automobiles. (Lacoste cars.) Gasoline commercial automobiles.

Lacoste et Cie.—28 bvd. Strasbourg, Paris, France. Mfrs. high and low tension magnetos, coils, spark plugs, storage batteries, primary batteries.

Lacre Motor Car Co., Ltd.—1-5 Poland St., London, W., England. Mfrs. tops, bodies, gasoline automobiles. (Lacre cars.)

Lacroix-Chevassu, J.—Morez, Jura, France. Mfrs. goggles.



Lacroix, Paul Louis Jacques.—Gen. Mgr. Renault Frères Selling Branch. Vice-Pres. Leon Rubay, B. Paris, France, Feb. 7, 1880. Ed. J. B. Say High School of Paris. Mem. N. Y. Motor Club. Res., 275 Central Park West. Office, 1776 Broadway, New York City. In au-

tomobile trade since 1896.

La Crosse Motor Car Co.—127 N. 3d St., La Crosse, Wis. (Mitchell, Cadillac.)

Lacy, E. L.—Pittman, N. J. (Ford.)

Ladewig & Stock Co.—227 Madison St., Waukesha, Wis. Est. since 1894. Cap., \$15,000 W. E. Ladewig, Treas. and Pres.; Wm. F. Ladewig, Vice-Pres.; H. F. Stock, Sec. Garage, 10 cars; repairing.

Ladewig, W. E.—Treas. and Pres. Ladewig & Stock Co., 227 Madison St., Waukesha Wis.

Ladewig, Wm. F.—Vice-Pres. Ladewig & Stock Co., 227 Madison St., Waukesha, Wis.

Ladies Quaker City Motor Club.—Philadelphia, Pa.

"La Durandal."—11 bvd. de Strasbourg, Paris, France. Mfr. non-skids.

Lafitte, J.—Biarritz, Basses-Pyrennees, France. Mfrs. horns.

Laforez.—155 ave. de Neuilly, Neuilly-sur-Seine, France. Mfr. motorcycles. (H. L. motorcycles.)

La France Automobile.—Pub. at 68 ave. de la Grande Armée, Paris, France.

La France Auto Repair & Supply Co.—Florence St., Marlboro, Mass. (Maxwell.)

La France Motor Car Co.—451 E. Market St., Elmira, N. Y. (Corbin.)

La France Motor Co.—753 5th Ave., New York City. (Cottin & Desgouttes.) Cap., \$70,000. Arthur L. Ruland, Pres.; H. M. Kirkland, Vice-Pres. and Treas. Repairing.

Lag-bolt.—See Screw, Lag.

Lag, Magnetic.—The tendency of the induced magnetism in iron, etc., to lag

behind the magnetizing force to which it is due.

Lagging.—Any non-conducting material, such as asbestos, used for covering a boiler, cylinder, etc., in order to prevent loss of heat.

Lagonda Motor Co., Ltd.—Thorpe Rd., Staines, London, England. Mfrs. automobile motors.

Lagonda Motor Mfg. Co.—Coventry, England. Mfrs. tricars. (Lagonda tricars.)

La Grange, J. W.—Franklin, Ind. (National.)

La Grange Machine Works.—La Grange, Ind. Garage.

Laidlaw, Jr., Wm. R.—244 W. 49th St., New York City. Mfr. automobile robes, cloth and paper trimmings.

Laing Machine, Automobile & Repair Co.—416 Sycamore St., Plainfield, N. J. (Cadillac, Haynes, Waltham.)

Laisant, F. R.—Treas. New Jersey Automobile Co.—855-7 Springfield Ave., Newark, N. J.

Lakdel Automobile Co.—5143 Delmar Blvd., St. Louis, Mo. (Wayne, De Luxe.) Est. August, 1906. Cap. \$15,000. J. A. Prescott, Pres. and Gen. Mgr.; Frank Meyer, Sec. and Treas.; W. Smythe, Supt. of Shop; A. C. Coleman, Foreman in Garage. Garage to house 35 cars.

Lake & Elliot.—Albion Works, Braintree, England. Mfrs. jacks.

Lake Forest Automobile & Machine Co.—Lake Forest, Ill. Garage.

Lake Shore Auto Station.—520 Dearborn Ave., Chicago, Ill. Garage.

Lake Shore Engine Works.—Marquette, Mich. Mfrs. motorboats.

Lakeport Mfg. Co.—Lakeport, N. Y. Mfrs. steam engines.

Lakeside Inn Track Association.—E. C. Hickman, Sec., San Diego, Cal.

Lake View Auto Station.—55 Evanston Ave., Chicago, Ill. Garage.

Lakewood Auto Garage.—106-118 Main St., Lakewood, N. J. (American Mercedes, Locomobile, Pope-Waverley, Columbia.) Est. March, 1900. Cap., \$50,000. Not inc. Jos. B. Hoff, Prop. Machine shop, blacksmith shop and brazing facilities, electric charging, garage, 150 cars.

La Locomotion Automobile.—Pub. at 15 rue Bouchut, Paris, France.

La Locomotrice, Société Anonyme.—35 rue de Vennes, Liège, Belgium. Mfrs. gasoline automobiles, gasoline commercial automobiles. (La Locomotrice.)

Lamb & Co.—Kent and Lyons Sts., Grand Rapids, Mich. Mfrs. electric controllers, electric motors.

Lamb Auto Co.—207-209 6th Ave., Clinton, Ia. (American Mercedes, Peerless, Cadillac, Baker, Pope-Waverley.) Est. since 1904. Cap., \$10,000. J. D.

Lamb, Pres.; V. A. Bonney, Vice-Pres. and Treas.; F. B. King, Sec. Garage to house 15 cars; repairing.

Lamb Boat & Engine Co.—Clinton, Ia. Mfrs. gasoline automobile motors, motorboats.

Lamb, G. B.—Sec. Post & Lester Co., Sergeant St., Hartford, Conn.

Lamb Electric Co.—31 Canal St., Grand Rapids, Mich. Mfrs. electric generators, special automobile machinery, electric motors.

Lamb, E. P.—Supt. Camden Anchor-Rockland Machine Co., Camden, Me.

Lambert & Von Tacky.—16 N. Franklin St., Titusville, Pa. (Pierce Arrow, Stevens-Duryea, Buick.) Est. 1904. Garage 25 cars; repairing.

Lambert Agency, Pacific Garage.—1227 W. Washington St., Los Angeles, Cal. (Lambert.)

Lambert, A. R.—Pur. Agt. Buckeye Mfg. Co., Anderson, Ind.

Lambert Auto Co.—343 Golden Gate Ave., San Francisco, Cal. (Lambert.)

Lambert, B. F.—Pres. and Supt. Buckeye Mfg. Co., Anderson, Ind.

Lambert, J. W.—Sec., Treas., Gen. Mgr. and Designer, Buckeye Mfg. Co., Anderson, Ind.

Lambert, S. W.—Vice-Pres. Buckeye Mfg. Co., Anderson, Ind.

Lambert, W. S.—724 W. 8th St., Anderson, Ind. Garage.

Lamberty, Geo.—Sec. Leon Rubay, 1697 Broadway, New York City.

Laminated Spring.—Same as plate spring. See Spring.

Laminated Tube Co.—Columbus, O. Mfrs. steel tubing.

Lamination.—Building up with flat strips or plates. Cores of transformers and many other iron parts of electrical machinery are laminated in order to prevent the production of induced or Foucault currents in the metal.

Lamp.—A device for illuminating or heating. The lamps employed on motorcars are of three types, viz., acetylene, kerosene and electric; and of four varieties: head, side, tail and search. See Head-light, Side-light, Tail-light and Search-light.

Lamp, Acetylene.—A lamp specially constructed to burn acetylene and consisting of a generator, burner, reflector and lens. There is another type of the lamp with a separate generator and which includes a rubber bag to regulate the pressure. Cylinders of compressed gas are also used which obviate the necessity of carrying a generator.

Lamp, Dome.—An electric lamp provided with a holoplane glass globe and designed for closed cars and motor-boat cabins.

Lamp, Electric.—Since the introduction of the dynamo, lightning by small

incandescent lamps of low voltage has become very popular. For lighting tail-lamps a voltage of from 4 to 6 volts is sufficient, and for side or head-lights from 8 to 20 volts are necessary.

Lamp, Gauge.—A small electric lamp used for illuminating gauges, speedometers, oilers and clocks on motor-cars.

Lamp Ignition.—See Ignition.

Lamp, Pilot.—An incandescent lamp used to indicate roughly when the voltage of a dynamo, storage-battery, etc., has its proper value.

Lamp, Soldering.—A lamp, called also a "blow-torch," used instead of a soldering-iron to make a soldered joint.

Lamping, Geo. B.—Sec. and Treas. Pacific Coast Auto Co., 1414-16 Broadway, Seattle, Wash.

Lamplugh et Cie.—8 rue Ernest-Cognacq, Levallois-Perret, Seine, France. Mfrs. bodies.

Lamson & Sessions Co.—412-453 Scranton Ave., Cleveland, O. Mfrs. bolts and nuts, wrenches.

Lamy jeune et fils.—Morez, Jura, France. Mfrs. goggles.

Lamy, Nap.—Three Rivers, Quebec, Canada. (Maxwell.)

Lancashire Steam Motor Co.—Leyland, England. Mfrs. steam commercial automobiles. (Leyland trucks.)

Lancaster Automobile Club.—Jacob D. Rider, Sec., 20 N. Queen St., Lancaster, Pa.

Lancaster Automobile Co.—215 N. Prince St., Lancaster, Pa. (Buick, Pope-Toledo, Pope-Waverley, Winton.)

Lancia, Vincenzo.—B. in Fonbello, Italy. Aug. 24, 1881. A noted racing driver connected with the

Fiat Automobile Co. (Fabbrica Italiana Automobili Torino) Turin, Italy. Was first in the Mont Cenis hill-climbing contest in 1902 and won the Brescia race in 1904. He competed in the second Vanderbilt cup race, finish-



ing fourth, and also in the third race; his position in the latter was second.

Land.—The elevated part between two grooves, as on a reamer, drill, etc. The "land" does the cutting or work, usually on one of its edges.

Land, H. L.—Suffolk, Va. Garage.

Landau.—A closed carriage entered from the sides, and having a front seat and two rear seats placed face to face. It can be converted into an open vehicle by folding down the heads, or the rear

head only, if the front has a wood and glass top.

Landau, Henry W.—117 Green St., Newark, N. J. Mfr. fire extinguishers.

Landaulet-Limousine.—A closed carriage for four persons inside with side entrance and additional swinging or rigid seats just forward of the rear seat to accommodate the four persons. This type is modeled after the limousine and is the most popular of closed bodies.

Landemard, Aubert et Cie.—10 rue de Rambouillet, Paris, France. Mfrs. detachable rims.

Landen, J. C.—Jackson, Miss. (Cadillac.)

Landers Bros. Co.—445 10th St., Toledo, O. Mfrs. celluloid sheets, automobile covers, rubber cloth, cloth and carpet trimmings.

Landis, Eberhardt.—Tiffin, O. Garage.

Landis, Samuel K.—122 E. Chestnut St., Lancaster, Pa. (Logan, Reo, Jackson, Premier.)

Landis Tool Co.—Waynesboro, Pa. Mfrs. special automobile machinery.

Lane, Geo.—Pres. Lane Motor Vehicle Co., Poughkeepsie, N. Y.

Lane, Louis L.—Broadway, near Pine St., Seattle, Wash. Garage.

Lane Motor Vehicle Co.—Prospect St., Poughkeepsie, N. Y. Makers of the Lane steam car, first marketed in 1900, and automobile jacks. Sixteen different models made since. Geo. Lane, Pres.; J. M. Janes, Treas.; Silas Lane, Sec. Lane Sales Co., Gen. Sales Agents, 514 W. 145th St., New York City.

Lane, O. W.—117 Grand St., Lansing, Mich. (Ford.)

Lane Sales Co.—514 W. 145th St., New York City. Gen. Sales Agts. for the Lane Motor Vehicle Co., Poughkeepsie, N. Y.

Lane, Silas.—Sec. Lane Motor Vehicle Co., Poughkeepsie, N. Y.

Lane, T. W.—Amesbury, Mass. Mfr. wood and metallic bodies.

Lang, Chas. E.—Sec., Treas., Gen. Mgr. and Purch. Agt. The Rauch & Lang Carriage Co., W. 25th St., Cleveland, O.

Lang, Geo. H.—Mgr. Supply Dept. H. R. Olmstead & Son, 413 S. Clinton St., Syracuse, N. Y.

Lang, V. B.—Vice-Pres. and Gen. Mgr. Hartford Rubber Works Co., 691 Park St., Hartford, Conn.

Lang, Walter.—Pur. Agt. Sayers & Scovill Co., 2247-2261 Colerain Ave., Cincinnati, O.

Langdon Motor Co., Ltd.—101 Southwark St., London, S. E., England. Mfrs. transmission and differential gears.

Langhorne Transportation Co.—Langhorne, Pa. (Reo, Knox, Elmore.)

Langsenkamp-Wheeler Co.—Indianapolis, Ind. Mfrs. brass, bronze, aluminum and copper castings.

Langstaff Machine Works.—65 Maple St., Chicago, Ill. Garage.

Lanhan, Geo. W.—Greenburg, Ind. (Ford, Maxwell.)

Lanich, Arthur S.—Baraboo, Wis. (Gale.)

Lanoline.—A yellowish-white substance, viscous, neutral, odorless, of fatty appearance, prepared from the "suint" of grease or wool. It consists of a mixture of fatty bodies and cholesterine, dissolved in benzine and gasolene. It is used for making fabrics impermeable.

Lansden Co., The.—54-56 Lackawanna Ave., Newark, N. J. Makers of the Lansden electric cars and trucks; first marketed in 1904. Cap. \$30,000. J. M. Lansden, Jr., Gen. Mgr. and Designer; F. A. Whitten, Supt.; C. F. Schutter, Purch. Agt.

Lansden, J. M., Jr.—Gen. Mgr. and Designer Lansden Co., 54-6 Lackawanna Ave., Newark, N. J.

Lanza Donato & L.—La Paz, Bolivia. (Wayne.)

Lap.—A piece of soft metal or wood, coated with fine emery, and used in "lapping" or finishing off polished surfaces of hard metal. (2) The extent to which the slide-valve of a steam-engine travels beyond the ports which it opens and closes. (3) The distance to which the plates in a "lap-joint" lie over each other.

Lapeer City Garage.—Lapeer Mich. (Ford.)

Lap-joint.—See Joint, Lap.

Lapped Valve.—A slide-valve with a lap.

Lap-strake, Clinker-built.—See Clinker.

Lap-welding.—See Welding, Lap.

Lapointe Machine Tool Co.—Boston, Mass. Mfrs. special automobile machinery.

Laporte Carriage Co.—Laporte, Ind. Mfrs. wood and metallic bodies.

La Porte, V. E.—1729 19th St., Bakersfield, Cal. (Jewel.)

Lappe, A. A.—Treas. Standard Leather Co., 296 Spring Garden Ave., Allegheny, Pa.

Lappe, Chas. H.—Vice-Pres. Standard Leather Co., 296 Spring Garden Ave., Allegheny, Pa.

Lappe, Geo. J.—Pres. and Gen. Mgr. Standard Leather Co., 296 Spring Garden Ave., Allegheny, Pa.

Lappe, J. H.—Sabina, O. (Jewel.)

Laramie Cycle & Garage Co.—314 2d St., Laramie, Wyo. (Maxwell.) Est. 1903. Cap. \$30,000. Gus Johnson, Pres. Garage, 14 cars; repairing.

Larava, Henry.—Master Mechanic Bay State Stamping Co., 380 Chandler St., Worcester, Mass.

Larboard.—See Port (2).

Larimer, W. G.—5069 Centre Ave., Pittsburg, Pa. Garage.

Larkenhead, J.—Mgr. Howe Motor Car Co., 11 Park Ave., Patterson, N. J.

Larkins, Geo.—Foreman Garage Dept. Citizens' Motor Car Co., N. E. cor. 7th and Main Sts., Cincinnati, O.

Larrimore Buggy Top Co.—Baltimore, Md. Mfrs. cushions, automobile tops.

Larsen, J. M.—Omaha, Neb. (Acme.)

Larsen, F. T.—Adv. Mgr. C. H. Blomstrom Motor Co., De Luxe Motor Car Co., Clark and Jefferson Aves., Detroit, Mich.

Larzelere, H. B.—Pres. Larzelere Machine Co., 225 Maynard St., Williamsport, Pa.

Larzelere, H. B.—Sales and Adv. Mgr. Chadwick Engineering Works, 3207 Spring Garden St., Philadelphia, Pa.

Larzelere, L. J.—Sec. and Treas. Larzelere Machine Co., 225 Maynard St., Williamsport, Pa.

Larzelere Machine Co.—225 Maynard St., Williamsport, Pa. (Lambert.) Est. 1890. Cap. \$35,000. H. B. Larzelere, Pres.; L. J. Larzelere, Sec. and Treas. Garage, 3 cars.

Lasky & Levy.—20-22 Waverley Pl., New York City. Mfrs. wearing apparel, caps.

Lassen, C. T.—Cedar Lake, Ind. Garage.

Latham.—Schenectady, N. Y. (Ford, Corbin.)

Latham, C. H.—Norwich, N. Y. (Buick.)

Lathrop, J. W.—Mystic, Conn. Mfrs. gasolene marine motors.

Latil Société Française de Mécanique et d'Autos.—Colombes and St. Owen, France. Mfrs. gasolene commercial automobiles. (Latil forecarriages.)

Latta, L. M.—Akron, O. (Jewel.)

Lau, A. F.—Designer Royal Equipment Co., 165 Housatonic Ave., Bridgeport, Conn.

Lauff, F. D.—Sec. Hiland Automobile Co., 5811-17 Center Ave., Pittsburg, Pa.

Laugenour, Henry.—625 Ashbury St., San Francisco, Cal. (Dolson.)

Laughlin, James, 3d.—Vice-President Cleveland Motor Car Co., Cleveland, O.

Launch, Naphtha.—A name first applied, in 1885, to the smaller series of yacht tenders using the "naphtha-engine" as a power-plant; and, later on, to boats up to 70 feet in length, driven by the same engine—the precursor of the Daimler gasolene-motor introduced in 1889.

Laural, F. A.—Cashier Continental Caoutchouc Co., 43 Warren St., 2100 Broadway, New York City.

Laurence, W. A.—Vice-Pres. Sturgeon Bay Boat Mfg. Co., Sturgeon Bay, Wis.

Laurin et Klement, Slavia Fahrradwerke.—Jungbunzlau, Bohemia, Austria. Mfrs. tricars (Laurin-Klement tricars), gasolene automobiles (Laurin-Klement cars), motorcycles.

Lauth & Co., J.—528 Elston Ave., Chicago, Ill. Mfrs. transmission gears.

Lava.—A term often applied to a form of talc much employed as an insulating material in spark-plugs; properly, melted and solidified volcanic rock.

Lavalette & Co.—112-114 W. 42d St., New York City, and 111 bis, Bvd. de Menilmontant, Paris, France. Mfrs. Eisemann Lavalette magnetos. U. S. selling agents for R. B. F. ball and ball thrust bearings, Lemoine axles, springs and automobile parts. Est. 1902 in France, 1906 in New York City. Henri de Lavalette, Prop.; F. Ducasse, Gen. Mgr., New York; C. F. Elliott, Sales Mgr.; E. Gassman, Chief Engineer.

La Valette, Henri de.—Proprietor La Valette & Co., 112-114 W. 42d St., New York City, and 111 bis, Bvd. de Menilmontant, Paris, France. Governor Automobile Club of France. Address, 6 Place de la Madeleine, Paris, France.

La Vaulx, Henry de, Count.—120 Avenue des Champs-Élysées, Paris, France. B. at Bierville, Normandy, April 2, 1870.



Chevalier of the Legion of Honor and officer of the Academy. He is a celebrated aeronaut and made his first ascension July 18, 1898, with Count de Castillon under the direction of M. Mallet, vice-president of the Aeronautic Club of France, of which he was one of the

first promoters. He has made more than two hundred ascensions, certain ones of which placed him at the head of the aeronauts of the entire world. See Balloon Records.

Lavigne Mfg. Co.—Detroit, Mich. Mfrs. lubricators, oil cups, oil pumps.

Law, Walter William.—Retired. B. Kidderminster, England, Nov. 13, 1837. Ed. public school. Honorary degree from Yale University of M. A. Director W. & J. Sloane, Nairn Linoleum Co., Briarcliff Lodge Assn., Briarcliff Realty Co. Mem. Century, Briarcliff Golf clubs. Res. and office, Briarcliff Manor, Westchester Co., N. Y. Donor of Briarcliff Trophy to be contested for the first time April, 1908.

Lawler, R. B.—Clarksdale, Miss. (Winton.)

Lawley & Son Corp., Geo.—696 E. 1st St., Boston, Mass. Mfrs. motorboats. Cap. \$100,000. G. F. Lawley, Pres., Gen. Mgr.

Lawley, E. A.—Clerk, Pur. Agt. Geo. Lawley & Son Corp., 696 E. 1st St., Boston, Mass.

Lawley, Fred D.—Designer Geo. Lawley & Son Corp., 696 E. 1st St., Boston, Mass.

Lawley, G. F.—Pres., Gen. Mgr. and Supt. Lawley & Son Corp., 696 E. 1st St., Boston, Mass.

Lawley, Thos.—60 Kenyon St., Birmingham, England. Mfr. chains.

Lawrence & Co.—Cheapside, London, E. C., England. Mfrs. radiators.

Lawrence & Co., L.—Newark, N. J. Mfrs. wood and metallic bodies.

Lawrence Street Motor Car Co., Inc.—13, 15, 17 W. Warren St., Lawrence, Kan. (Ford.) Est. Nov. 15, 1903. Inc. Nov. 15, 1906. Cap., \$20,000. H. B. Pearis, Pres.; W. E. Spalding, Sec. and Treas.; Carl Graeber, Vice-Pres.; J. W. Chadwick, Mgr.; W. E. Baumgartner and W. R. Stubbs, stockholders. Garage, 12 cars; repairing.

Lawrence, W. A.—Vice-Pres. Sturgeon Bay Boat Mfg Co., Sturgeon Bay, Wis.

Lawson's Garage.—810, 812, 814, 816 South St., Peekskill, N. Y. (Cadillac, Pope-Hartford, Pope-Toledo.) Supplies; garage; repairs.

Lawton, B. L.—Vice-Pres. and Treas. Connecticut Telephone & Electric Co., Inc., 70 Britannia St., Meriden, Conn.

Lawton & Co., J. A.—24 Orchard St., Oxford St., London, W., England. Mfrs. bodies.

Lay-shaft.—See Shaft, Lay.

Layton, C. G.—Danville, Ill., and Pottomac, Ill. (Northern, Rambler, Lambert.)

Layton, W. C.—Spartanburg, S. C. (Waltham)

Lazarnick, Nathan.—Press photographer. B. Russia, Sept. 7, 1879. Ed. public and high schools. Res. 145 W. 118th St. Office, 29 W. 42d St., New York City. In trade since 1899. Owned first car 1906. Was first photographer to specialize automobile work, and has the largest



collection of automobile photographs in the United States.

Lazaro, Albert E.—Hartford, Conn. (Compound)

Leach, A. R.—580 Lake Ave., Rochester, N. Y. (Queen, De Luxe.)

Leach, Ed. E.—Franklin, Pa. (Holman.)

Leach, E. W.—Franklin Falls, N. H. (Pope-Hartford.)

Lead.—A metal which is silvery white when pure, but which, in moist air, becomes coated with a film of gray matter,

thought to be suboxide. Its atomic weight is 206.9 and its melting point 600° F. (315.5° C.) It is very soft and can be made, by pressure, into wire or piping. It is used for making the plates of storage-batteries, and enters into the composition of some important alloys.

Lead.—The amount by which the steam-port is open at the beginning of the stroke of the piston. See Lap. (2) A term to denote the position of the piston in a gasoline motor before firing. See Lead, Ignition.

Lead.—The wire by which the current flows from the generator to its work. That by which it flows back is called the "return." "Lead" is also a name for a small tube conveying a lubricant.

Lead, Black.—A synonym for graphite, q. v.

Lead, Ignition.—The "lead of the ignition" or "lead of the spark" signifies ignition before the piston has completed its upward stroke. When the igniter fires the mixture at the dead center it is said to have no lead. After the piston has started on its downward stroke it is said to have a negative lead. See Spark Advance.

Lead, Red.—A brilliant red and very heavy powder, called also "minium." Chemically it is triplumbic tetroxide, and is prepared by exposing the monoxide (litharge) for a long time to the air at a faint red heat. It is used in automobilism for making a cement for joints and for making "pasted" plates for storage batteries.

Lead, White.—A carbonate of lead sometimes used for forming joints.

Leader.—Of two wheels in mesh, the "driver." See Gearing.

Leading Edge.—That edge of a propeller blade which cuts water first.

Leader & Sons, C. C.—9th and Independent Sts., Shamokin, Pa. (Maxwell.)

Leader Automobile Co., The.—2442 Lisbon Ave., Milwaukee, Wis. Mfrs. motorcycles.

Leader Mfg. Co.—1808 Chestnut St., St. Louis, Mo. Mfrs. automobile body polishes, metal polishes.

Lea, E. S.—Pres. Motor Car Specialty Co., 112 N. Broad St., Philadelphia, Pa.

Leaf.—One of the several steel plates of which a vehicle spring is composed. (2) One of the several teeth of a pinion.

Leaf-spring.—Same as plate-spring. See Spring.

Leaf-valve.—See Valve, Leaf.

Leaf-chain.—See Chain, Leaf.

League Cycle Store.—325 Southwest Temple St., Salt Lake City, Utah. (Indian.)

Lear Automobile Co., Oscar.—Motor Mart, Broadway and 62d St., New York City. (Frayer-Miller.)

Lear Auto Co., Oscar.—4th and Gay Sts., Springfield, O. Makers of the Frayer-Miller car; first marketed in 1904. Five models made since. Cap. \$250,000. Oscar Lear, Pres. and Gen. Mgr.; W. J. Miller, Vice-Pres. and Supt.; Julius F. Stone, Sec. and Treas.; H. H. Hawkins, Arch. Agt.; H. H. Knepper, Mgr. Motor Mart, New York City.

Lear, Oscar.—Pres. and Mgr. Oscar Lear Automobile Co., Springfield, O.

Leas, J. & J.—West Manchester, O. (Premier.)

Leather.—Leather of various kinds is largely used in automobilism for the manufacture of noiseless gear-wheels, for facing clutches, for making twisted, round and flat belts, for the piston-packing of pumps, for washers, for motor-boat and motor-car upholstery, motor-boat fenders, etc.

It is employed also in tire making, in which its principal use is in covers for ordinary rubber tires. An all-leather tire, however, will not rot, heats very little, and is proof against blow-outs, sand-boils, etc., and not only pneumatic, but solid tires are now being made of it.

Leather, Artificial.—A product obtained by combining rubber and shredded leather, and used as treadstrips on many rubber tires. By this method artificial leather can be made of leather which has been used for other purposes, much as rubber scrap is now utilized.

Leather, Burned.—Burned leather is almost universally employed, in England especially, in the case-hardening of steel.

Leather, Chrome.—A leather tanned by impregnating the skin (after a preliminary liming, unhairing and fleshing) with a solution of chrome salt. When properly manufactured chrome leather possesses the following qualities: It resists the action of boiling water without undergoing any appreciable alteration; it absorbs water with difficulty and does not harden on drying. Its tensile strength is three or four times greater than that of tanned leather, and it possesses a remarkable elasticity which once earned for it the title of "rubber leather." It is largely used for belting and in the manufacture of tires and tire-treads.

Leather, Rock.—See Cork, Rock.

Leatherette.—An imitation leather used extensively in the upholstery of motor-boats, particularly for cushion covers.

Leather & Brass Mfg. Co.—24, 26 E. Genessee St., Auburn, N. Y. Mfrs. power driven air compressors, tire pumps, lifting jacks. Cap., \$10,000. Est. 1898. F. E. Ten Eyck, Pres.; C. C. McKinney, Treas. Garage.

Leather Tire Goods Co.—1325 Boylston St., Newton Upper Falls, Mass. Mfrs. Woodworth tire protector, Kant-Skid tire grip, emergency repair strap. Mem. M. & A. M. Not inc. Est. 1905. Chas. B. Woodworth, D. Woodworth and A. P. Marshall, partners. Branches: 1662 Broadway, New York City. Fred Blumenfeld, Mgr.

Leavitt & Co., C. W.—St. Paul Bldg., New York City. Mfrs. and jobbers, ores, metals and alloys.

Leavitt & Co., J. W.—441 Golden Gate Ave., San Francisco, Cal., and Oakland, Cal. (Cleveland. Reo, Stoddard-Dayton.)

Leavitt, B. F.—Sec. and Treas. Uncas Specialty Co., 21 Shipping St., Norwich, Conn.

Leavitt, Gilbert.—11 India St., Boston, Mass. Mfr. metal polishes.

Leavitt, Wm. C.—Norway, Me. (Canada.)

Leavy, J. J.—Vice-Pres. Rochester Gas Engine Co., Rochester. N. Y.

Lebanon Motor Works.—12th and Walnut Sts., Lebanon, Pa. Mfrs. gasoline automobiles. (Upton cars.)

Leber, G. J.—Chief Engineer and Pur-
Agt. Long Arm System Co., Lakeside Ave. and E. 38th St., Cleveland, O.

Le Blon, Hubert.—B. in Paris, France, March 21, 1874. An inventor and noted driver of racing cars, having taken part in all the principal French contests since 1900. In 1901 and 1902 he won the hill-climbing contest at Nice. He competed in the third Vanderbilt cup race,



driving one of the three Thomas cars.

Leblond et Commun.—Guignes-Rabutin, France. Mfrs. primary batteries.

Le Bron, A. W.—Montgomery, Ala. (Maxwell.)

Le Brun, C. et H. Lecomte.—14 rue Victor Hugo, Puteaux, France. Mfrs. radiators.

Lebrun et Cormerais.—10 rue Lamoricière, Nantes, France. Mfrs. radiators.

Le Caoutchouc, Société Anonyme.—39 ave. Marceau, Courbevoie, France. Mfrs. pneumatic rubber tires.

Le Centaur, Société Anonyme.—208 cours Gambetta, Lyons, France. Mfrs. non-skids.

Lecerf.—17 Faubourg de Paris. Peronne, Somme, France. Mfrs. non-skids.

L'Echo des Sports.—Pub. at 13 rue du Faubourg Montmartre, Paris, France.

Leckner, H. B.—1162 St. Albans Ave., Detroit, Mich. Repairing.

Leclanché et Cie.—158 rue Cardinet, Paris, France. Mfrs. primary batteries.

L'Electricien.—Pub. at Paris, France.

Lederer, Simeon.—4711 Forestville Ave., Chicago, Ill. Garage.

Ledin, F.—30 quai de la Charité, Lyons, France. Mfr. jacks.

Ledvina, D.—201 2d St., S. E., Washington, D. C. Garage.

Lee.—The part toward which the wind blows.

Lee & Porter Mfg. Co.—Buchanan, Mich. Mfrs. axles.

Lee, Arthur S.—52 Richmond St., Providence, R. I. (Royal.)

Lee Injector Co.—Port Huron, Mich. Mfrs. lubricators.

Lee, John R.—Pres. John R. Keim Mills, Inc., Kensington Ave. and Erie Tracks, Buffalo, N. Y.

Lee Mfg. Co., The.—Conners St., Port Huron, Mich. Mfrs. transmissions, steering gears, brass castings, iron and steel machine work, injectors, globe and check valves. Cap., \$50,000. Est. 1903. E. D. Van Ness, Pres.; W. L. Jenks, Treas.; E. L. Moak, Sec.

Lee Motor Car Co.—1218 S. Main St., Los Angeles, Cal. (Cadillac.)

Lee, Thomas.—Outlet Rock, New Brunswick, N. J. Garage.

Lee, Walter Richard.—Sec. and Gen. Mgr. New York Automobile Trade Association and Gen. Mgr. Importers Auto Salon. B. Albany, N. Y., Sept. 10, 1883. Ed. public school. Mem. New York Athletic Club. Res. 405 8th St., Brooklyn, N. Y. Office. 47 W. 42d St., New York City. Connected with automobile trade for three years. Recreations, skating, swimming, rowing, motoring.

Lee's Patent Spiral Thread Co.—3 Pall Mall, Manchester, England. Mfrs. non-skids.

Leedom Bros.—San Bernardino, Cal. Garage.

Leek, S. L.—9th Ave. and Mulberry St., McKeesport, Pa. Garage.

Leeward.—The side or direction toward which the wind blows; opposed to "windward."

Lefebvre, fils, Albert.—5 rue Delteaal, Pré St. Gervais, Paris, France. Mfrs. circulating pumps, lubricators.

Lefebvre Arms Co.—Syracuse, N. Y. Mfrs. chains.

Left-hand Screw.—See Screw.

Legare, J. L.—Ogdensburg, N. Y. Mfr. motorboats.

Legendre, A. C.—Reims, France. Mfr. electric horns.

Leger et Lailault.—15 rue de Corneille, Levallois, Seine, France. Mfrs. detachable rims.

Legros & Knowles.—Cumberland

Park, Willesden Junction, London, England. Mfrs. automobile motors.

Léguas, René.—16 rue de l'Inondation, Fécamp, France. Mfrs. automobile motors.

Lehan, James.—Stoughton, Mass. (Pope-Hartford.)

Lehigh Valley Auto Co.—46 Broad St., Bethlehem, Pa. (Lambert.)

Lehman Bros.—10 Bond St., New York City. Mfr. automobile heaters.

Lehman, I.—61 Middle St., Cleveland, O. Mfr. steel tubing.

Lehr Agricultural Co.—Fremont, O. Mfrs. gasoline automobiles.

Lehr, G. N., Dr.—Vice-Pres. The Maxwell & Fitch Co., 218 S. Washington St., Rome, N. Y.

Leiding, H. T.—115 State St. W., Savannah, Ga. Repairing.

Leighton, H. J.—901 Fayette St., Syracuse, N. Y. Mfrs. gasoline marine motors, motorboats.

Leitch Mfg. Co.—Amesbury, Mass. Mfrs. wood and metallic bodies.

Lejeal Cycle & Mobile Works.—17 Sassafras St., Erie, Pa. (Indian.)

Lejeune, Marcel.—93 rue d'Angoulême, Paris, France. Mfr. clutches.

Leland, Henry M.—Mgr. Cadillac Motor Car Co. B. Danville, near St. Johnsbury, Vermont, February 16, 1843. Educated public schools of Worcester Co., Mass. Director Cadillac Motor Car Co. Mem. A. C. of Detroit, Michigan State Automobile Assn., National Metal Trades Assn., National Founders' Assn., National Mfg. Assn. Res., 69 Watson St. Office, Cadillac Motor Car Co., Detroit, Mich. Connected with automobile trade since 1900. Organized the Leland & Faulconet Mfg. Co., Detroit, in 1890, the Cadillac Automobile Co. in 1902. Consolidated with the Cadillac Motor Car Co. in 1905.

Leland, Louis F.—Vice-Pres. and Treas. Manhattan Screw & Stamping Works, W. End Ave. and 67th St., New York City.

Leland, W. C.—Sec. Cadillac Motor Car Co., 1343 Cass Ave., Detroit, Mich.

Leland & Co., W. H.—Southbridge St. and Hope Ave., Worcester, Mass. Mfrs. crank shafts, special automobile machinery.

Le Métais & Co., Louis.—22 rue du Bois, Levallois, France. Mfrs. gasoline automobiles. (Le Métais cars.)

Lemoigue & O'Beirne.—1735 Grand Ave., Kansas City, Mo. (Panhart.)

Lemoine.—Ivry-Port, Paris, France. Mfr. pressed steel frames, springs, wood wheels.

Lemoine, J.—39 Blvd. Baudoin, Brussels, Belgium. Mfr. acetylene and oil lamps.

Lemont, B. A.—Bretton Woods, N. H. Garage.

Lemont Motor Car Co.—6 Tirrell St., Worcester, Mass. (Buick.)

Leng, Chas. W.—Pres. John S. Leng's Son & Co., 33 Murray St., New York City.

Leng's Son & Co., John S.—33 Murray St., New York City. Mfrs. Agts. weldless cold drawn steel tubes. Jobbers of tires, tubes, chains, grips, lamps, bells, carbide, wrenches, pumps, odometers, horns, spark plugs, batteries, goggles, jacks. Cap., \$100,000. Est. Feb. 1, 1888. Charles W. Leng, Pres.; James B. Pratt, Sec. and Treas.

Length Over All.—The distance from one extreme end of a car to the other extreme end. In motor-boat measurements abbreviated to l. o. a.

Lenham, N. L.—Sec. and Treas. Commercial Battery Co., 204-6 Michigan St., Chicago, Ill.

Lennox Chemical Co.—Cleveland, O. Mfrs. tire inflating tanks.

Lenox Auto Co.—60 W. 116th St., New York City. Garage.

Lentz, A. R.—Asst. Supt. Heindel Mfg. Co., Hanover, Pa.

Lenz Land & Loan Co.—Jamestown, N. D. (Buick.)

Leonard, H. M.—625 Broad St., Elyria, O. (Jackson.) Est. since 1904. H. M. Leonard, Mgr.; Fred Fridenstine, Supt. Repair Dept. Garage, 50 cars; repairing.

Leonard Motor Car Co.—Cleveland, O. (Jackson.)

Leonard, O. A.—Sec. National Spring & Wire Co., Albion, Mich.

Leonard, S. J.—Motor Sales Co., 1771 Broadway, New York City.

Lephbridge Motor Car Co.—Lephbridge, Ala., Canada. Mfrs. gasoline automobiles.

Le Phénix, Pneumatiques.—107 rue de Paris, Petit-Ivry, Seine, France. Mfrs. pneumatic rubber tires.

Lerch, A. L.—Sales Mgr. American Motor Truck Co., Caledonia St., Lockport, N. Y.

Lérede, R.—29 rue Brunel, Paris, France. Mfr. spark plugs.

Le Repperton.—37 rue des Abondances, Boulogne-sur-Seine, France. Mfr. tire filling.

Le Roy Transfer & Storage Co.—Le Roy, N. Y. (Holsman.)

Les fils de Peugeot Frères.—Valentigney, Doubs, France. Mfrs. shock-absorbers.

Lesser, Julius.—St. Louis, Mo. (Ranier.)

Less-More Valveless Engine Co.—N. Tonawanda, N. Y. Mfrs. motorboats.

Lester Co., E. F.—Fayetteville, N. Y. Mfrs. aluminum solder.

Lester, H. W.—Treas., Post & Lester Co., Sergeant St., and Sec. Veeder Mfg.

Co., cor. Garden and Sargeant Sts., Hartford, Conn.

Letcher Auto Co.—1st and St. James St., San Jose, Cal. Garage.

Letting-down.—The softening of hardened steel by heating it up to a definite temperature.

Levan, H. B.—Treas. Detroit White Lead Works, 532-60 E. Milwaukee Ave., Detroit, Mich.

Levenhager Auto & Garage Co.—Warsaw, Wis. (Rambler.)

Lever.—A rigid rod or bar turning about a fixed point called a "fulcrum." On automobiles, levers are used for operating gears, brakes, etc.

Lever, Change-speed.—A lever, usually hand-operated, by which the different speeds are controlled.

Lever, Control.—A small metal lever, provided with a wooden handle and placed on top or below the steering-wheel of an automobile, and which serves to regulate and control, at the will of the driver, the carburetter, spark-advance, admission, etc.

Such levers revolve on an axis and work over a plain or notched quadrant, and are held in place by a small triangular piece of steel, which engages the notches of the quadrant, or by a tongue bearing on the plain quadrant.

Lever, Driving.—The same as controller-lever.

Lever, Controller.—A lever used for operating the controller of an electromobile.

Lever, Hand.—See Lever, Control. on the steering-wheel and employed for operating the throttle, ignition, etc.

Lever, Ignition.—A lever for advancing and retarding the point of ignition.

Lever, Quality.—In surface and some other types of carburetters, a lever for controlling the proportions of air and fuel in the mixture.

Lever, Quantity.—In surface and other carburetters, a lever for controlling the amount of mixture allowed to pass from them.

Lever, Side.—A steering-lever situated at the side of the driver's seat.

Lever, Spark.—The same as ignition-lever, q. v.

Lever, Starting.—A long lever used for starting the motor.

Lever, Steering.—See Steering-lever.

Lever, Timing.—The same as ignition-lever, q. v.

Lever, Tire.—A lever of special shape, called also a "dismounting lever," for easily mounting or dismounting tires. Tire levers are of various shapes, are made of wood or metal, and require but little strength for their manipulation.

Lever, Toggle.—One of the levers actuating the float in some carburetters.

Leverenz, E. B.—930 3d St., Milwaukee, Wis. (Aerocar, Cameron.)

Levy, A.—Pres. Kentucky Automobile Co., 1051 3d Ave., Louisville, Ky.

Levy & Fanning Co.—390 Wabash Ave., Chicago, Ill. (Autocar, Lozier.)

Levy, Geo. B.—Sec. C. A. Coey & Co., 1424 Michigan Ave., Chicago, Ill.

Levy, Herbert.—Treas and Sales Mgr. Kentucky Auto Co., 1051 3d Ave., Louisville, Ky.

Levy, Manassch.—182 Broadway, New York City. Mfr. automobile clocks.

Lewis & Son, J. A.—Mankato, Minn. (Cadillac.)

Lewis Auto Co.—Lewis Ave. & Hancock St., Brooklyn, N. Y. Garage.

Lewis, Chas. E.—Pres. Jackson Automobile Co., Jackson, Mich.

Lewis, Chas.—Pres. Lewis Spring & Axle Co., Jackson, Mich.

Lewis, E. W.—Asst. Sec. and Sales Mgr. Timken Roller Bearing Axle Co., Canton, O.

Lewis, Fred H.—Sec., Treas. and head of Axle Dept. Lewis Spring & Axle Co., Jackson, Mich.

Lewis, Fred R.—Pomona, Cal. Garage.

Lewis, H. H.—Fort Worth, Tex. (Rainier.)

Lewis, I. M.—Conneaut, Pa. Garage.

Lewis, John C.—3033 Monroe St., Toledo, O. (Indian.)

Lewis, John G.—Buffalo, N. Y. (American.)

Lewis, L. D.—Seattle, Wash. (Frayer-Miller.)

Lewis, S. H.—Binghamton, N. Y. (Maxwell.)

Lewis Spring & Axle Co.—Jackson, Mich. Mfrs. automobile springs. Cap., \$21,000. Est. 1892. Charles Lewis, Pres.; Fred J. Keiser, Vice-Pres. and Supt. Spring Dept.; Fred H. Lewis, Sec., Treas. and Supt. Axle Dept.

Lewis, Theo. G.—Pres. Buffalo Dental Mfg. Co., 587-9 Main St., Buffalo, N. Y.

Lewiston Auto Exchange.—Lewiston, Me. Garage.

Lewistown Motor Car Co.—Lewistown, Pa. (Pullman.)

Lewis, T. S.—509 Chestnut St., St. Louis, Mo. (Logan.)

Lewis, William Mitchell.—Mgr. Mitchell Motor Car Company. Born Racine, Wisconsin, February 25, 1869. Ed. McMynn Academy, Wayland Academy, Racine College, Yale, 1891. Director Mitchell Motor Car Co., Mitchell & Lewis Co., Yucca Cyanide Mining & Milling Co. Mem. Milwaukee Athletic, N. Y. Athletic, Chicago A. C., Calumet Club, Chicago; Yale Alumni Assn. Res., 1500 Main St., Racine, Wis. Office, Mitchell Motor Car Co., Racine Junction, Wis. In automobile trade since 1903. Used first car 1902. Recreations, baseball, football, tennis.

Lewis, W. T.—Pres. Mitchell Motor Car Co., Racine, Wis.

Lexington Garage.—135 E. 40th St., New York City. Garage.

Leyford Bros.—625 E. Washington Ave., Bridgeport, Conn. (Oldsmobile.)

Leyman, H. S.—Sales Mgr. C. H. Blomstrom Motor Co., Clark and Jefferson Ave., Detroit, Mich.

Leyman, H. S.—Sales Mgr. De Luxe Motor Car Co., Clark and Jefferson Ave., Detroit, Mich.

L'Huillier et Duquesne.—62 rue de Villiers, Levallois, France. Mfrs. radiators.

Libby, DOWILLE S.—Designer Knox Motor Truck Co., Springfield, Mass.

Libbey, Frank P.—Salt Lake City. Utah. (Lozier.)

Libby, F. W.—Sales Mgr. Michelin Tire Co., Milltown, N. J.

Liberty Association.—12 State St., Chicago, Ill. Mfrs. fire extinguishers, linseed oil soap, metal polish. Cap., \$500,000. Est. 1897. Josiah T. Hair, Pres.; Burchard R. Hair, Sec., Treas. and Mgr.

Liberty Auto Co.—138 Beatty St., E. E., Pittsburg, Pa. (Wayne, National, Mitchell, Mora.)

Liberty Bell Co.—Bristol, Conn. Mfrs. bells.

Liberty Brass Foundry.—1095 Niagara St., Buffalo, N. Y. Mfrs. brass castings.

Lichtie Auto Co.—818 Jefferson Ave., Toledo, O. (Cadillac.)

Liebling, Wm. G.—Treas. and Sec. A. R. Mosler & Co., 163 W. 29th St., New York City.

Life.—The period during which an object may be kept in actual use.

Lift.—The upper parts of a foundry mould.

Lift, Valve.—See Valve, Lift.

Lifter, Valve.—See Valve-lifter.

Lifting-jack.—See Jack.

Light Mfg. & Foundry Co.—509 Queen St., Pottstown, Pa. Mfrs. aluminum, brass and bronze castings. Member M. & A. M. Cap., \$150,000. Est. 1890. Jonas S. Wagner, Pres.; Frank S. Brant, Vice-Pres.; E. S. Fretz, Sec., Treas. and Gen. Mgr.; W. I. Grubb, Supt.

Light Motors, Ltd.—180 Gray's Inn Road, London, W. C. England. Mfrs. motorcycle motors, motorcycles. (Fairy.)

Light, Oliver.—280 St. Nicholas Ave., New York City. Garage.

Lights.—The government requires a sailing yacht to show the same lights at night as are required of any sailing craft, the regulation red and green side-lights, when under sail, and the white riding light when at anchor. Small power-boats, when using combination lights should have a white light showing between the red and green. When showing separate side-lights they should display a white mast-head light. The federal regulations governing lights on

all craft are the same, no matter whether the vessel is used for pleasure or business purposes, and are in force from sunset to sunrise. For rules concerning motor vehicle lights. See Section II.

Lights, Tell-tale.—On a motor-boat, red and green lights which cannot burn unless the side-lights are lighted, and which indicate at once in the engine-room the going out of a side-light.

Lilley & Co., M. C.—Columbus, O. Mfrs. wearing apparel, caps, gloves, gauntlets, leggings, miscellaneous.

Lilly Varnish Co.—670 Rose St., Indianapolis, Ind. Mfrs. varnishes.

Lima Automobile Club.—Lima, O. F. T. Cuthbert, Sec.

Lima Automobile Co.—Lima, O. (Jackson.)

Limbach, H.—Purch. Agt. Ford Motor Co., Detroit, Mich.

Limit, Elastic.—The point to which a body may be strained or deformed and still retain the power of completely recovering its original shape after the stress has been removed. When such limit is exceeded the body does not recover its shape, but retains a permanent form, or "set."

Limousine.—A closed carriage, of which the front seats are partially open, while the rear seats are ordinarily completely inclosed. The window separating the front seats from the rear can be lowered into a casing or swung on hinges to the roof. The roof ordinarily carries a baggage rack.

Limousine & Carriage Mfg. Co.—35th St. and Michigan Ave., Chicago, Ill. Mfrs. wood and metallic bodies, bow sockets, automobile tops, glass wind shields. Edward C. Voltz, Pres.; Walter N. Beecher, Sec. and Mgr.; Daniel W. Voltz, Treas.

Lincoln Carriage Auto Co.—216 W. 50th St., New York City. Garage.

Lincoln Electric Co.—1-3 Union Square, New York City. Mfrs. primary batteries, electric generators.

Lincoln Electric Co.—Cleveland, O. Mfrs. controllers (electric), motors (electric).

Lincoln Park Auto Station.—1071 N. Clark St., rear, Chicago, Ill. Garage.

Lind, H. H.—Sec. The Ohio Blower Co., 330 Prospect Ave., N. W., Cleveland, O.

Lindberg, V.—Supt. for Repair Dept., Metropolitan Automobile Co., 57 61 Stanhope St., Boston, Mass.

Lindineier, P. F.—1164 W. Lake St., Chicago, Ill. (Glide.)

Lindow, August.—Supt. Michigan Bolt & Nut Works, foot Mildrum Ave., Detroit, Mich.

Lindsay, A. M., Jr.—523 Granite Bldg., Rochester, N. Y. Mfr. timers.

Lindsay Motor Mfg. Co., Ltd., The.—Woodbridge, England. Mfrs. gasoline automobiles. (Lindsay.)

Lindsey, W. G.—Pur. Agt., H. H. Franklin Mfg. Co., 302 S. Geddes St., Syracuse, N. Y.

Line.—That which is conceived to have length without any other dimension. (2) A unit of length (now rarely used) equal to 1-12 of an inch. (3) The adjustment of a machine or its parts in working order.

Linear Speed.—See Speed.

Line of Action.—The Mathematical line along which a force is exerted.

Lines of Force.—See Force, Lines of.

Liner.—A thin piece of metal interposed between parts of a mechanism in order to adjust them. See Shim.

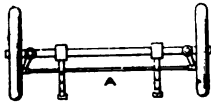
Lineberger, Paul N.—Vice-Pres. and Gen. Mgr. Rainier Motor Car Co., Broadway and 56th St., New York City.

Linhardt, Frank.—Foreman Nickel Plating Dept. Eclipse Machine Co., Elmira, N. Y.

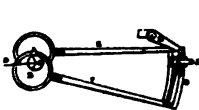
Link.—A connecting bar with a bearing at each end for connecting it to a similar link or links, or to other elements of a machine. (2) One of the elements of a chain.

Link, Drag.—A rod, A (see figure), connecting the two steering arms of a motor vehicle; sometimes called "tie-bar," "drag-bar," "cross-bar," "cross-link" and "distance rod."

(2) The levers, etc., used in the link motion of a steam engine.



Link-motion.—A reversing device used for working the slide-valve in steam-engines. The valve rod, I, one end of which is attached to the slide-valve, terminates at its other end in a block which slides in a slotted link, O. To the ends of this link are attached the rods, E and



F, to the ends of which are fixed the eccentrics, A and B. The link, O, can be raised or lowered by a system of levers so that either the upper eccentric rod, E, or the lower one, F, is in line with the valve-rod, I. Either eccentric can thus be made to drive the valve-rod, and if the two are so fixed that they drive the valve in opposite directions, then the engine can be reversed by raising or lowering the link so that either E or F is in line with the rod I.

Link, Reversing.—The slotted link used in link-motion.

Link, Steering.—The same as Drag-link. q. v.

Link Belt Co.—Chicago, Ill. Mfrs. chains, turntables.

Link Belt Engineering Co.—Nictown, Pa. Mfrs. chains.

Linkroum-Smelser Automobile Co.—17 Bank St., Newark, N. J. (Lozier.)

Linole Mfg. Co.—Santa Clara, Cal. Mfrs. tire fluid.

Linoleum.—A material imitating leather and sometimes used as a covering for the floor of automobiles. Linoleum is made of a very siccative oil (linseed oil), to which is added powdered cork. The mixture is variously colored, as desired, by the addition of other vermilion, ultramarine, etc. The paste is poured over a fabric of varying thickness, forming a support, upon which it is spread under strong pressure.

Linon, L.—Ensival-lez-Verviers, Belgium. Mfr. motorcycles, automobile motors.

Linscott Motor Co.—163 Columbus Ave., Boston, Mass. (Wayne, National, Reo.)

Lins Pneumatik Co.—Krausenstrasse 36, Berlin, Germany. Mfrs. pneumatic rubber tires.

Lins Pneumatik Co.—Schönebeck-am-Elbe, Germany. Mfrs. non-skids.

Linton, C. M.—173 N. Bend St., Pawtucket, R. I. (Jackson.)

Lintol, H. C.—45 Main St., Nashua, N. H. (Reo.)

L'Inviolable.—53 rue Laugier, Paris, France. Mfr. speed indicators.

Linz, F. J.—Partner Linz-Sanborn Automobile Co., 505 Golden Gate Ave., San Francisco, Cal.

Linz-Sanborn Automobile Co.—505 Golden Gate Ave., San Francisco, Cal. (Maxwell.) Est. Nov., 1906. Not inc. Partnership, L. H. Sanborn, F. J. Linz.

Liotard Frères.—22 rue de Lorraine, Paris, France. Mfr. lubricators.

Lipe, Willard C.—Mechanical Engineer. B. Fort Plain, N. Y., Dec. 21, 1861. Ed. common school and Clinton Liberal Institute. Director Brown-Lipe Gear Co., H. H. Franklin Mfg. Co., Lipe & Walrath Co., Globe Malleable Iron Co., Syracuse Aluminum & Bronze Co., Engleberg Huller Co. Mem. clubs: Syracuse Yacht, Citizens', Syracuse Boys', Syracuse Chamber of Commerce. Res., 116 Holland St., Syracuse. Office, 208 S. Geddes St., Syracuse, N. Y. In the trade since 1899. Used first car 1903.

Lipman, C. E. L.—Pres. Lipman Mfg. Co., 300 Pleasant St., Beloit, Wis.

Lipman Mfg. Co.—300 Pleasant St., Beloit, Wis. Mfrs. electric speed indicators, rotary pumps. Mem. M. & A. M. Cap. \$60,000. Est. 1906. C. E. L. Lip-

man, Pres.; A. B. Melville, Vice-Pres.; L. H. Parker, Sec. and Treas.

Lippincott Steam Specialty & Supply Co.—Newark, N. J. Mfrs. machine work to order, screw machine products, power driven tire inflators, flexible tubing.

Lippincott, Z.—Long Branch, N. J. (Waltham.)

Lipsey & Co., H. H.—3843 Grand Bvd., Chicago, Ill. Garage.

Lip Valve.—The same as mushroom-valve.

Liquid.—A fluid which is distinguished from a gas by the fact that it occupies a definite volume, whatever be the size of the containing vessel, and always possesses a definite surface, which is horizontal when at rest.

Liquid Fuel Engineering Co.—Bridgeport, Conn. Mfrs. gasoline and kerosene burners.

Liquid Fuel Engineering Co.—Cowes, Isle of Wight, England. Mfrs. steam commercial automobiles, steam automobiles. (Lifu cars.)

Liska, Vincent.—Supt. Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.

Lisk & Petry.—405-407 Diamond St., Hudson, N. Y. (Stevens-Duryea, Cadillac, Thomas.) Est. 1903. Edward H. Lisk, head office; Wm. Petry, head Mechanical Dept. Garage, 30 cars; repairing.

Lisk, Edw. H.—Head of office Lisk & Petry, 405-7 Diamond St., Hudson, N. Y.

List.—The tilting or careening of a vessel to one side.

Litchfield, B. A.—Treas. Hess-Pontiac Spring & Axle Co., Pontiac, Mich.

Litchfield, P. W.—Supt. Goodyear Tire & Rubber Co., Akron, O.

Litharge.—The fused yellow protoxide of lead; a product of a yellow color, used as an ingredient in the active material of storage-battery plates.

Litmus-paper.—Paper dipped into a solution of litmus and used for ascertaining the polarity of battery terminals. See Pole Paper.

Litre.—The unit of capacity for liquids in the metric system, and equal to about one quart, English measure.

Little End.—The piston end of the connecting rod of a gasoline motor. See Big End.

Little, George B.—Vice-Pres. Walworth Mfg. Co., 128-136 Federal St., Boston, Mass.

Little Grant Mfg. Co.—88 Wall St., New York City. Mfrs. fire extinguishers.

Little Rock Auto Co.—Little Rock, Ark. (Buick, Dolson.)

Little, W. H.—Factory Mgr. Buick Motor Co., Flint, Mich.

Littlefield Mfg. Co., W. S.—134 Eliot St., Boston, Mass. Mfrs. speed indicators. Cap., \$20,000. Est. October, 1906.

Samuel C. Hopkins, Pres.; W. S. Littlefield, Treas. and Mgr.; E. F. Mahady, Director.

Littlefield, W. S.—Treas. and Mgr. W. S. Littlefield Mfg. Co., 134 Eliot St., Boston, Mass.

Live.—Operative or effective, as distinguished from dead or idle.

Live Axle.—See Axle, Live.

Live Force.—See Force, Live.

Live Power.—See Power, Live.

Live Steam.—See Steam, Live.

Liverpool Rubber Co., Ltd.—292 Vauxhall Rd., Liverpool, England. Mfrs. pneumatic tires.

Livesey-Pionnie Motor Car Co.—136 S. 11th St., Newark, N. J. (Dolson.)

Livingston, C. V.—Rondout, N. Y. Repairing.

Livingston Radiator Co.—10 E. 31st St., New York City. Mfrs. radiators.

Lloyd & Co., A. J.—323 Washington St., Boston, Mass. Mfrs. eye shields.

Lloyd, Dr. O. H.—Hereford, Tex. (Holsman.)

Lloyd, Herbert.—Pres. Electric Storage Battery Co., Allegheny Ave. and 19th St., Philadelphia, Pa.

Lloyd Motor & Engineering Co.—132 Monument Rd., Birmingham, England. Mfrs. L. M. C. motorcycles.

Load.—The resistance to a motor of the machinery which it drives, apart from its own friction. (2) The output, in watts, required from a dynamo or other electrical plant or machinery, that is, the electrical power which the plant is required to furnish to the circuit which it supplies. (3) The weight supported by a structure.

Lobee, Bart.—Gen. Supt. Lobee Pump & Machinery Co., cor. Terrace and Erie Sts., Buffalo, N. Y.

Lobee, B. F.—Pres. and Gen. Mgr. Lobee Pump & Machinery Co., cor. Terrace and Erie Sts., Buffalo, N. Y.

Lobee Pump & Machinery Co.—Cor. Terrace and Erie Sts., Buffalo, N. Y. Mfrs. rotary circulating and gear pumps. Cap. \$80,000. Est. 1899. B. F. Lobee, Pres. and Gen. Mgr.; Walter Voss, Sec. and Treas.; Bart. Lobee, Gen. Supt.

Locher & Robb.—315 S. Burdick St., Kalamazoo, Mich. (Franklin.)

Locher, J. A.—Supt. C. H. Blomstrom Motor Co., Clark and Jefferson Aves., Detroit, Mich.

Locher, J. A.—Supt. De Luxe Motor Car Co., Clark and Jefferson Aves., Detroit, Mich.

Lock.—The oblique position of the steering wheels of a motor-car with respect to the axle when swerving; sometimes called the "steering lock."

Lock, Air.—See Air-bound, and Pocket, Air.

Lock-nut.—See Nut, Lock.

Lock-steering.—See Steering-gear.

Lock Auto Co.—3d and Adams Sts., Evansville, Ind. Garage.

Locke & Co.—218 W. 84th St., New York City. Mfrs. wood and metallic bodies, dashes and fenders.

Locke, Albert N.—Treas. Locke Regulator Co., 76 North St., Salem, Mass.

Locke, N. C.—Pres. Locke Regulator Co., 76 North St., Salem, Mass.

Locke Regulator Co.—76 North St., Salem, Mass. Mfrs. side levers, automatic pressure regulating valves. Cap., \$250,000. Est. 1871. N. C. Locke, Pres.; Albert N. Locke, Treas.; Chas. A. Archer, Sec.; Clarence H. Vitty, Auditor.

Lockhart Iron & Steel Co.—McKee's Rocks, Pa. Mfrs. angle, channel and tee iron and steel, bar iron and steel.

Lock Haven Auto Co.—Lock Haven, Pa. (Pope-Toledo, Franklin.)

Lockwood & Co., F. E.—39 Wall St., Norwalk, Conn. (Locomobile, Waltham, Autocar, Elmore, White.) Garage; supplies; repairing.

Lockwood & Co.—Norfolk, Conn. Garage; supplies; repairing.

Lockwood-Ash Motor Co.—Jackson, Mich. Mfrs. gasolene marine motors.

Lockwood Bros.—103-109 W. Pearl St., Jackson, Mich. (Pope-Toledo, Jackson.) Garage; supplies.

Lockwood, Carl J.—Washington, D. C. (Stanley.)

Lockwood Co.—34 Mechanic St., Newark, N. J. Mfrs. lamps.

Lockwood, E.—104 2d St., Laramie, Wyo. (Mora, Cartercar, Smith.)

Locomobile Co.—400 Newbury St., Boston, Mass. (Locomobile.) Est. 1899. S. T. Davis, Jr., Pres.; Thos. H. Thomas, Treas.; K. M. Blake, Supt.

Locomobile Co. of America.—Seaside Park, Bridgeport, Conn. (Locomobile.)

Locomobile Co. of America.—1354 Michigan Ave., Chicago, Ill. (Locomobile.) A. J. Banta, Supt.

Locomobile Co. of America.—Broadway and 76th St., New York City. (Locomobile.) J. F. Plummer, Mgr.

Locomobile Co. of America.—249 N. Broad St., Philadelphia, Pa. (Locomobile.) I. J. Morse, Supt.

Locomobile Co. of America.—Foot Main St., Bridgeport, Conn. Makers of the Locomobile car; first marketed July, 1899. Twenty-one models made since. S. T. Davis, Jr., Gen. Mgr.; A. L. Riker, Designer; A. C. Schulz, Asst. Designer; E. F. Russell, Supt.; W. Perry, Asst. Supt.; J. T. Roche, Jr., Pur. Agent; A. W. Robinson, Sales Mgr.; J. A. Kingman, Advt. Mgr.; J. F. Plummer, Mgr. Branch at 76th St. and Broadway, New York City; K. M. Blake, Supt. Branch at 400 Newbury St., Boston, Mass.; I. J. Morse, Supt. Branch at 245 N. Broad St., Philadelphia, Pa.; A. J. Banta, Supt. Branch at 1354 Michigan Ave., Chicago,

Ill. Agents and dealers: Allen Asten Co., Greenwich, Conn. Automobile & Supply Corp., New Haven, Conn. Automobile Co. of Washington, Washington, D. C. Automobile Co., New Orleans. Beebe, O. N., Essex, Conn. Billings, Frank, Marlborough, Mass. Buck Auto & Implement Co., Davenport, Ia. Callahan, Atkinson & Co., D., Baltimore, Md. Capen Motor Car Co., St. Louis, Mo. Carlow Auto Co., Taunton, Mass. Colburn Automobile Co., Denver, Colo. Compania Vehiculos Elec., Mexico City, Mexico. Covey, H. M., Portland, Ore. Davis Automobile Co., Providence, R. I. Fort Pitt Automobile Co., Pittsburg, Pa. General Motor Car Co., San Francisco, Cal. Hanauer Automobile Co., Cincinnati, O. Jordan Automobile Co., Minneapolis, Minn. Lockwood & Co., F. E., Norwalk, Conn. Lopez, Herman, Havana, Cuba. Lowe Supply Co., S. C., New Bedford, Mass. Lubeck Auto Co., Grand Rapids, Mich. Marble, W. H., Brockton, Mass. Miami Motor Car Co., Dayton, O. Parks, A. S., Wichita, Kan. Pope Automobile Co. of Washington, Washington, D. C. Pratt, C. B., Elkhart, Ind. Remson Mfg. Co., J. S., Brooklyn, N. Y. Russel, T. M., Middletown, Conn. Sessions, J. B., Bristol, Conn. Seattle Automobile Co., Seattle, Wash. Sterling Mfg. Co., Fall River, Mass. Stevens, B. A., Charles City, Ia. Springfield Automobile Co., Springfield, Mass. Success Automobile Co., Los Angeles, Cal. Taylor Automobile Co., Albany, N. Y. Towle & Co., E. H., Waterbury, Conn. U. S. Motor Car Co., Rochester, N. Y. Welch Motor Car Co., Milwaukee, Wis. Wheth Automobile Co., St. Joseph, Mo. Wyoming Valley Motor Car Co., Wilkes-Barre, Pa. Yonkers Auto Station, Yonkers, N. Y.

Loeb, M. A.—Sec. and Treas. Rock Island Battery Co., 9th and Sycamore Sts., Cincinnati, O.

Loew, Oscar A.—Supt. Globe Machine & Stamping Co., 3868 Hamilton Ave., N. E., Cleveland, O.

Log.—A device usually a triangular board, called also "log-chip" or "log-ship," for showing the speed of a vessel. See Knot.

Log-line.—See Knot.

Logan Construction Co.—Cor. 2nd and Canal Sts., Chillicothe, O. Makers of the Logan pleasure and commercial cars. First marketed in September, 1901. Eleven different models made since. Cap. \$250,000. Jos. L. Schilder, Pres.; B. A. Gramm, Vice-Pres., Gen. Mgr., Designer and Purch. Agt.; C. F. Smith, Treas.; F. Biszantz, Supt.; B. E. Stevenson, Sales and Advt. Mgr.; H. T. Hermann, Asst. Advt. Mgr.

Logan Cycle Co.—320 Main St., Salinas, Cal. Garage.

Logan, Ernest C.—White Plains, N. Y. (Maxwell.)

Logan Iron & Steel Co.—Burnham, Pa. Mfrs. bar iron and steel.

Logan Mfg. Co.—Phoenixville, Pa. Mfrs. steel castings.

Logansport Auto Co.—Broadway, near 6th St., Logansport, Ind. (Haynes.)

Lohlein, Jos.—Laramie, Wyo. Garage.

Lohner und Co., Jacob.—2 Porzellangasse, Vienna, Austria. Mfrs. bodies.

Lomas, A.—Storage Mgr. Bryant Garage. 50-56 W. 43d St., New York City.

Lomason, H. A.—Sec. and Treas. Douglass & Lomason Co., 302-310 Grand River Ave., Detroit, Mich.

Lombardi Motor Co., The.—Derby, Conn. Mfrs. flexible tubing, speedometers.

Lombardi Motor Co.—71 Minerva St., Derby, Conn. (Oldsmobile.)

Lombard Iron Works & Supply Co.—Augusta, Ga. (Waltham.)

Lombard Tube Co.—Birmingham, England. Mfrs. metallic rims.

Lomer, Louis L.—Care U. S. Legation, Buenos Ayres, A. R. (Columbia.)

Londe, Alfred M.—Mechanical Director Standard Auto Works, 110 5th Ave., Clinton, Ia.

London Auto Co.—Clapham Rd., London, S. W., England. Mfrs. motorcycles.

London Auto Supply Co., The.—1229-1231 Michigan Ave., Chicago, Ill. Mfrs. automobile tops, glass fronts. Cap., \$20,000. Est. Jan., 1904. Jas. C. Simm, Jr., Pres., Treas. and Gen. Mgr.; Fred P. Rugee, Vice-Pres.; Arthur M. Simm, Sec.; Frank J. McAvoy, Supt.

London Scottish Rubber Co.—162 Clerkenwell Rd., London, E., England. Mfrs. non-skids, acetylene lamps.

Lonerger & Co., J. E.—211-13-15 Race St., Philadelphia, Pa. Mfrs. lubricating devices, pop safety and relief valves, steam gauges, pressure reducing valves. Not inc. Est. 1875. John E. Lonergan, Sole Owner; L. G. Skillhorn, Supt.; H. O. Evans, M. E., Head Draughtsman; J. F. Lonergan, Wm. Tobin, Samuel Barrett, Michael Collaton, Henry Born, Alex. Fogel, Wm. Devine, J. T. Bowes, Richard Shillingsburg, Foremen.

Lonergan, John E.—Sole Owner J. E. Lonergan & Co., 211-215 Race St., Philadelphia, Pa.

Lonergan, J. F.—Foreman J. E. Lonergan & Co., 211-215 Race St., Philadelphia, Pa.

Longacre Automobile Depot.—507 W. 44th St., New York City. Garage.

Long, Adam A.—Vice-Pres. Long & Mann Co., Beehive Bldg., Graves St., Rochester, N. Y.

Longaker, V. A.—Pres. American Motor Car Co., Indianapolis, Ind.

Long & Mann Co.—Beehive Bldg., Graves St., Rochester, N. Y. Mfrs. au-

tomobile tire tools, detachable rims. Cap., \$50,000. Est. since May 1, 1906. A. S. Mann, Pres.; Adam A. Long, Vice-Pres.; A. J. Mann, Sec. and Treas.; Abram J. Mann, Mgr. New York office, 2 W. 125th St.

Long Arm System Co.—Lakeside Ave. and E. 38th St., Cleveland, O. Mfrs. front and rear axles, change gears, clutches, propeller shafts, hand levers, strut rods, buffers, steering reaches. Cap. \$400,000. Est. 1897. S. H. Chisholm, Pres.; W. B. Cowles, Vice-Pres. and Treas.; H. M. Fletcher, Sec.; R. A. Wilson, Supt.; G. J. Leber, Chief Engineer and Purch. Agt.; R. B. Weaver, Asst. Supt.; Hayden Eames, Gen. Sales Agt.

Long Beach Auto Co.—142 Pacific St., Long Beach, Cal. (Pope-Waverley, Tourist, Maxwell, Columbus.) Est. 1903. W. M. Varney, Prop. and Mgr.; F. L. Varney, Foreman of Repair Shop and Stock Clerk. Garage to house 150 cars; repairing.

Long Beach Country Club.—Raymond F. Ayers, Sec. Temple Court Bldg., New York City.

Long Branch Auto Co.—Long Branch, N. J. (Matheson.)

Longdin-Brugger Co.—Fond-du-Lac, Wis. Mfrs. automobile tops.

Longest Bros.—821 3d Ave., Louisville, Ky. (Ford, Stoddard-Dayton, White, Maxwell.)

Longhurst, James S., Jr.—Walnut St., Lynbrook, L. I., N. Y. Mfr. tire balm, aluminum lacquer, peacock blue, lubricants, acid cure, agatite, a substance for mending leaks in all kinds of metals. Est. ten years.

Long Island Automobile Club.—360 Cumberland St., Brooklyn, N. Y. Russell A. Field, Sec., care Brooklyn Eagle.

Long Island City Auto Garage Co.—E Ave., cor. 8th St., Long Island City, N. Y. Garage.

Long Island Garage Co.—159 Reid Ave., Brooklyn, N. Y. Garage.

Long Island Garage Co.—Glen Cove, L. I. Cap. \$25,000. Incorporators, Walter J. Balir, Arthur J. Farrell and Chas. A. Vostock. Garage.

Long Island Motor Parkway, Inc.—527 5th Ave., New York City. Branch Office, Denton Block, Mineola, L. I. Organized December, 1906. W. K. Vanderbilt, Jr., Pres.; Harry Payne Whitney, 1st Vice-Pres.; Jefferson De Mont Thompson, Treas.; A. R. Pardington, 2d Vice-Pres. Directors: W. K. Vanderbilt, Jr.; August Belmont, Colgate Hoyt, C. T. Barney, Frederick G. Bourne, Anton G. Hodenpyl, H. B. Hollins, J. Adolph Mollenhauer, Ralph Peters, A. R. Pardington, Mortimer L. Schiff, Jefferson De Mont Thompson, Levi C. Weir, Harry Payne Whitney, Col. John Jacob Astor, H. K. Burrass, John Far-

son, Clarence H. Mackey, W. G. McAdoo, Dave Hennen Morris, Dean Alvord, S. T. Davis, Jr.; Henry Ford, August Heckscher, E. R. Hollander, E. R. Thomas, H. B. Anderson. Chairmen of Committees: Charles T. Barney, Finance; W. K. Vanderbilt, Jr., Plan and Scope.

Long, L. Y.—524 Madison Ave., Albany, N. Y. Garage.

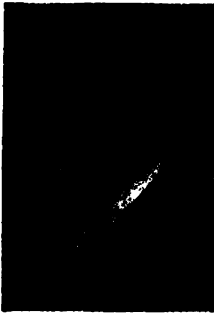
Long Mfg. Co.—1430-34 Michigan Ave., Chicago, Ill. Mfrs. dashes and fenders, hoods, radiators, brass and copper tubings.

Longmead Iron Co.—Conshohocken, Pa. Mfrs. wrought iron and steel pipe.

Longmont Automobile Club.—H. L. Large, Sec., Longmont, Colo.

Long-Turney Mfg. Co.—Rome, N. Y. Mfrs. condensers, hoods, radiators.

Long Wrench Co., J. R., The.—Akron, O. Mfrs. wrenches.



Longuemare, Fernand.—12 Rue de Buisson, St. Louis, Paris. Born at Bolbec in 1860. Co-partner in the firm of Longuemare Frères. Mem. A. C. F., A. E. C. F., A. G. A., T. C. F., M. C. F. and the Racing Committee of the A. C. F.

Longuemare Frères.—12 rue du Buisson, St. Louis, Paris, France. Mfrs. carburetters, radiators.

Longuemare, Georges.—12 Rue du

Buisson, St. Louis, Paris. Born at Bolbec in 1866. Co-partner in the firm of Longuemare Frères. Mem. of the Society of Civil Engineers (1905), A. C. F. (1896), A. E. C., A. G. A., T. C. F. Vice-Pres. of the Auto-Cycle Club of France. Sec. of the Aid

Committee of A. C. F. Mem. of the Technical Committee and Touring Committee of A. C. F.

Lonk & Compton.—1808 Farnan St., Omaha, Neb. (Maxwell.)

Lonk, Chas. F.—Jefferson. Ia., and Council Bluffs, Ia. (Maxwell.)

Look Electric Co.—1545 Michigan Ave., Chicago, Ill. Mfrs. storage batteries.

Loomis, A. C.—Gen. Mgr. The Frantz

Body Co., cor. Stanton Ave. and Gety St., Akron, O.

Loomis Autocar Co.—Westfield, Mass. Mfrs. carburetters, mufflers.

Loomis, F. L.—Sales and Advt. Mgr. Reliance Motor Car Co., 89 Fort St., E. Detroit, Mich.

Loomis, G. J.—Designer Modern Tool Co., 4th and State Sts., Erie, Pa.

Loose Pulley.—See Pulley.

Lootens, A. D.—Head of Experimental Dept. Puritan Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

Lopez, German.—Havana, Cuba. (Locomobile.)

Lorain Automobile Co.—Lorain, O. (Elmore.)

Lord, Dr. L. W.—West Ossipee, N. H. (Maxwell.)

Lord, Harry A.—Sec. Lord Motor Car Co., 1044 S. Main St., Los Angeles, Cal.

Lord, H. I.—Mgr. Sales Dept. Detroit Lubricator Co., Trumbull Ave., Lincoln Ave. and G. T. Ry.

Lord Motor Car Co.—1044 S. Main St., Los Angeles, Cal. (Cleveland, Kisselkar, Mason, Woods.) Est. 1906. Cap. \$25,000, \$15,000 paid. P. A. Lord, Pres. and Treas.; Harry A. Lord, Sec.

Lord, P. A.—Pres. and Treas. Lord Motor Car Co., 1044 S. Main St., Los Angeles, Cal.

Lord Polish Co., F. T.—Cambridge, Mass. Mfrs. metal polishes.

Lorge & Welch.—Minot, N. Dak. (Caddillac.)

Loring Auto Appliance Co.—Broadway and 63d St., New York City. Factory Somerville, Mass. Mfrs. speed indicators.

Loring, Elmer.—638 N. Main St., Brockton, Mass. (Maxwell.)

Loring, E. J.—Treas. and Gen. Mgr. Loring Speed Gauge Co., 91 Marshall St., Somerville, Mass.

Loring, George F.—Pres. Loring Speed Gauge Co., 91 Marshall St., Somerville, Mass.

Loring Motor Car Co.—Geo. J. Donahue, Brockton, Mass. (Maxwell.)

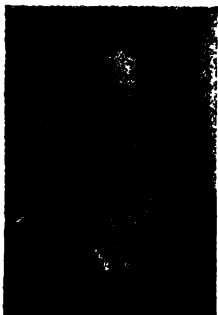
Loring Speed Gauge Co.—91 Marshall St., Somerville, Mass. Mfrs. speedometers, speed indicators. Cap \$40,000, \$21,000 paid in. Est. 1905. Inc. 1907. Geo. F. Loring, Pres.; E. J. Loring Treas. and Gen. Mgr.; C. W. Keefe, Sec.; W. M. Inge, Sales Mgr.

Lorraine Automobile Mfg. Co.—1812 22d St., Chicago, Ill. Mfrs. gasoline automobiles.

Lorry.—A large heavy commercial vehicle with a platform body and low wheels.

Lorthioy, E.—8 rue de la Voute, Paris, France. Mfr. radiators.

Los Angeles Automobile Club.—Chas. F. Gates, Sec., Los Angeles, Cal.



Lothrop Davis Co.—105 Main St., Tonopah, Nev. Est. 1904. Cap. \$200,000. T. L. Oddie, Pres.; R. B. Davis, Vice-Pres.; F. Y. Williams, Mgr.; J. W. Stewart, Sec. Garage; repairing.

Lotteau Frères.—16 rue du Pont, Choisy-le-Roi, Paris, France. Mfrs. Perfection motorcycles, automobile motors.

Loubier.—9 cours Lieutaud, Marseilles, France. Mfrs. motorcycles. (Regence motorcycles.)

Louck & Boehme—Kalona, Ia. (Moline.)

Louderback, G. B.—Sales and Advt. Mgr. Buckeye Mfg. Co., Anderson, Ind.

Loud, Fred A.—Merrimac, Mass. Mfrs. automobile tops; repairing.

Louis, O.—19 S. Water St. Ogdensburg, N. Y. Garage.

Louisville Automobile Club.—Charles Chreste, Sec., Louisville, Ky.

Louvre, Grands Magazins du.—164 rue de Rivoli, Paris, France. Mfrs. wearing apparel; coats.

Lovatt, J. N.—Bethlehem, Pa. (Haynes.)

Love, Jno. R.—Sec. Premier Motor Mfg. Co., Indianapolis, Ind.

Lovejoy, A. L.—Treas. and Gen. Mgr. Becker Brainard Milling Machine Co., 110 Business St., Hyde Park, Mass.

Lovejoy, Elmer.—Sec., Treas. and Business Mgr. Lovejoy Novelty Works, Laramie, Wyo.

Lovejoy Novelty Works.—Laramie, Wyo. Est. 1892. Cap. \$50,000. Chas. W. Brandis, Pres. and Advt. Mgr.; N. Lovejoy, Vice-Pres.; Elmer Lovejoy, Sec., Treas. and Business Mgr. Garage to house 30 cars; repairing.

Lovejoy, N.—Vice-Pres. Lovejoy Novelty Works, Laramie, Wyo.

Lovell, C. D. S.—Lynn, Mass. (Holsman.)

Low, F. E.—Steubenville, O. Garage.

Low Garage, S. C.—22 4th St., New Bedford, Mass. (Locomobile, Oldsmobile, Franklin.) Garage; repairing.

Low Pressure.—See Pressure, Low.

Low-water Alarm.—See Alarm, Low-water.

Lowe Co., Geo. H.—509 Tremont St., Boston, Mass. (Aerocar, American Mors.) Est. Dec., 1906. Cap. \$15,000. Geo. H. Lowe, Pres.; Fred L. Townsend, Treas. Garage to house 30 cars; repairing.

Lowe, Geo. H.—Pres. Geo. H. Lowe Co., 509 Tremont St., Boston, Mass.

Lowell Automobile Co.—Appleton St. and Post Office Ave., Lowell, Mass. (Stevens-Duryea, Cadillac, Pope-Hartford, Stanley). Supplies; garage and repairing.

Lowe, Philip A.—Pittsfield, Mass. (Stoddard-Dayton.)

Lowe's Auto Garage.—Pine and Morris Sts., Morristown, N. J. Garage.

Loyal, A.—204 rue St. Maur, Paris, France. Mfr. radiators.

Loze, J. M.—11 ave. du Bel-Air, Bois-Colombes, Seine, France. Mfr. solid tires.

Lozier Automobile Agency.—132 Valencia St., San Francisco, Cal. (Lozier.)

Lozier Motor Co.—1731 Broadway, New York City. Factories: Plattsburg, N. Y., and Stamford, Conn. Makers of the Lozier car, motor boats and marine motors. Cap. \$1,000,000. H. A. Lozier, Pres.; Sam. Regar, Treas.; Jno. G. Perrin, Supt.; C. A. Emise, W. S. Mead, F. C. Chander, Sales Dept. Repairing Lozier cars only.

Lubeck Automobile Co.—148 N. Ionia St., Grand Rapids, Mich. (Locomobile, Oldsmobile.)

Lubbock Motor Car Co., F. E.—Lubbock, Tex. (Jackson.)

Lubrication.—The interposition between two surfaces which rub together of a substance which has a smaller coefficient of friction with both the surface concerned than they have one with another. The operation of lubrication in motor vehicles is performed in accordance with several systems, viz: "Gravity-feed," "splash," "pressure" or "forced-feed," "ring," etc.

Lubrication, Chain.—Lubrication by means of small chains that dip into an oil-well, and as they are carried along by a shaft bring the lubricant up with them.

Lubrication, Forced-feed.—In forced-feed lubrication both mechanical and physical systems are employed. The former system is used by some of the leading makers. Channels are bored centrally through the crank-shaft, cranks, crank-pins, connecting-rods and wrist-pins, and the oil is driven by centrifugal force through all these to their bearings. In the latter system means are employed to utilize the pressure from the exhaust or water system. Under this action special means are employed to force the oil along the branch pipes leading from the lubricator. In pressure-feed the reservoir may be placed in any position, and below the level of the parts to be oiled. In such a case either the oil is forced through the pipes by an automatic force-feed pump driven by the motor, or part of the exhaust gas is diverted through a check-valve into the reservoir, maintaining a pressure on the oil of from 2 to 4 pounds as may be required. The pressure of the circulating water is sometimes used for the same purpose.

Lubrication, Gravity-feed.—Pure gravity-feed consists in the use of a sight-feed cup of toughened glass with a metal cap, in which there is a small shuttered air-hole, the closing of which regulates the supply through the tube beneath the

cup to the part to be lubricated. This is the simplest form of gravity-feed.

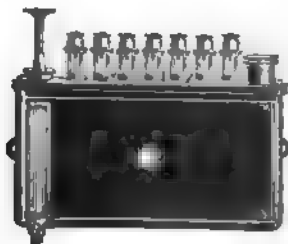
Lubrication, Grease.—Grease lubrication has many advantages for such parts as do not need very close and careful attention. A special lubricator is designed for use with grease.

Lubrication, Ring.—In this system, which is commonly used for the main motor-bearings, a ring is suspended from the journal in a recess provided in the brass and dipping into a small reservoir of oil below the bearing. The motion of the journal causes the ring to revolve, and thus a continual supply of oil is brought up to the bearing from the reservoir below.

Lubrication, Sight-feed.—A system, called also "drip lubrication," in which oil is brought up from a tank and distributed to the various bearings, the supply to the pipes being delivered through glass "sight-feed" tubes arranged with an adjustable valve, through which the oil passes, drop by drop, the number of drops per minute being regulated by a milled-headed screw.

Lubrication, Splash.—Splash lubrication is very universal for all bearings inside the motor, such as those for the crank-shaft, cam-shaft, and cams, inclosed gears, and the lower ends of the connecting-rods. It consists simply of a bath of oil inside the crank-case, the cranks dashing the oil over all the working parts. It is an uncleanly but thoroughly effective system, and is used also for the differential gear and the change-speed gearing.

Lubricator, Sight-feed.—An apparatus, called also a "mechanical oiler" and "drop oiler," whereby oil is fed drop by drop by dripping in a glass tube, so that the driver is able at all times to see the amount supplied to a bearing. See figure.



Lucan & Christensen.—556 Euclid Ave., Cleveland, O. Garage. (Mitchell.)

Lucas & Christenson.—2002 Euclid Ave., Cleveland, O. (Mitchell.)

Lucas & Co., John.—Philadelphia, Pa. Mfrs. paints, automobile body polishes and varnishes.

Lucas, C. O.—Front St., Greenville, O. Repairing.

Lucas, Ltd., Jos.—Great King St., Bir-

mingham, England. Mfrs. horns, jacks, tire pumps, acetylene lamps, oil lamps.

Lucas Co., W. P.—255 Elm St., Oil City, Pa. (Thomas Flyer, Haynes, Pope-Hartford.)

Luce & Banks Co.—87 Division St., Grand Rapids, Mich. (Maxwell.)

Lucey Motor Car Co.—231-233 River St., Troy, N. Y. (Aerocar, Stoddard-Dayton.) Garage.

Lucia Cycle Co.—113 Main St., Oconto, Wis. (Pope-Hartford, Pope-Toledo, Waltham.)

Lucia Cycle Co.—Green Bay, Wis. (Pope-Toledo, Pope-Hartford, Waltham.)

Lucke, Hermann.—Karlsruhe, Germany. Mfr. horns.

Luders, A. E.—Designer The Electric Launch Co., Ave. A and North St., Bayonne, N. J.

Ludington, G. A.—Head of Factory, The Fisk Rubber Co., Oak St., Chicopee Falls, Mass.

Ludlow, James B.—Mgr. Promotion Dept., Glidden Varnish Co., Rockefeller Bldg., Cleveland, O.

Lug.—A projecting stud or ear by which an object is grasped or supported, or which affords a bearing a support.

Lukens Steel Co.—Coatsville, Pa. Mfrs. steel.

Lumen Bearing Co.—Sycamore St. and Belt Line, Buffalo, N. Y. Mfrs. brass, bronze, aluminum and copper castings, babbitt metals, bronze metals, solder, aluminum solder.

Lumund, Joseph.—11 Union Ave., Rutherford, N. J. Garage.

Lundy Fulton Auto Co.—Bottineau, N. D. (Ford, Mitchell, Cameron.)

Lundy, C. A.—Reno, Nev. (Pope-Toledo, Franklin, Dorris.)

Lunette.—A small window furnished with glass or mica, placed in rear panel of a closed carriage.

Lunkenheimer, C. F.—Vice-Pres. The Lunkenheimer Co., Cincinnati, O.

Lunkenheimer, E. H.—Pres. The Lunkenheimer Co., Cincinnati, O.

Lunkenheimer Co., The.—Cincinnati, O. Mfrs. mechanical pressure and gravity lubricators, exhaust pressure regulators, oil pumps, cocks for oil, air and gasoline; crank cases, generator valves, needle valves. Mem. M. & A. M. Cap. \$2,000,000. Est. since 1862. E. H. Lunkenheimer, Pres.; C. F. Lunkenheimer and S. L. Moyer, Vice-Pres.; Wm. H. Muench, Treas.; David C. Jones, Sec.; Henry Ritter, Supt.

Lunken Valve Co.—35 Great Dover St., London, S. E., England. Mfrs. carburetters.

Lurie, John.—Proprietor The Auto Supply Co., 1733-37 Broadway, New York City.

Luries Automobile Depot.—287 Morris Ave., New York City. Garage.

Lusk, Rollin W.—Vice-Pres. The Auto Shop Co., 731 Vincent Ave., N. E., Cleveland, O.

Lustre Chemical Co.—1303 Michigan Ave., Chicago, Ill. Mfrs. carburetters. Wm. L. Paul, Pres., Sheridan, Ore.; G. W. Merwin, Vice-Pres., Sheridan, Ore.; W. P. Powers, Sec. and Treas., Chicago, Ill.

Luthy, G. G.—Sec., Purch. Agt., The Bartholomew Co., Peoria, Ill.

Lutia, L. I.—239 Jefferson Ave., Detroit, Mich. (Merkel.)

Luttrell Co., The.—1711-14th St., N. W., Washington, D. C. (Buick.) Inc. \$10,000. Incorporators: S. Alwin Muehlisen, Samuel A. Luttrell, E. Catesby Rowzee.

Lutz Co., Wm. F.—219-221 E. 4th St., Santa Ana, Cal. (Buick.) Est. 1892. Cap. \$50,000. Wm. F. Lutz, Pres.; A. J. Visel, Sec. Repairing.

Lutz, Wm. F.—Pres. Wm. F. Lutz Co., 219-221 E. 4th St., Santa Ana, Cal.

Luverne Automobile Co.—Luverne, Minn. Mfrs. gasoline automobiles, wood wheels. Garage.

Lux, Fabbrica di Automobili e Cicli.—2 corso Valentino, Turin, Italy. Mfrs. gasoline automobiles. (Lux cars and motorcycles.)

Lydon, A. S.—Ann Arbor, Mich. (Dragon.)

Lyell & Co., J. M.—Farnham, Va. (Holsman.)

Lyford Bros.—625 E. Washington Ave., Bridgeport, Conn. (Oldsmobile.)

Lynch Auto Co., A. S.—Independence, Ia. (Waltham.)

Lynch Co., Frank.—Fargo, N. D. (Cadillac, Pope-Waverley.)

Lynn Auto Co.—274 Broad St., Lynn, Mass. Mfrs. gasoline and kerosene burners. (Queen.)

Lyon, Geo. L.—Main and Chapel Hill St., Durham, N. C. (Reo, Premier.)

Lyon Rubber Co.—Akron, O. Mfrs. tire cement.

Lyons & Co.—Grand Forks, N. D. (Indian, Cadillac, Franklin.)

Lyons, John P.—Bellefonte, Pa. (Cadillac.)

Lytle, F. E.—Purch. Agt. The Garford Co., Elyria, O.

Lyttle, Herbert H.—An American racing driver who has participated in many contests in this country and in the Bennett Cup Race in 1905, driving a Pope-Toledo car. He participated in the second Vanderbilt race and finished in the elimination trials in the third Vanderbilt race, but was disqualified for being towed.



M

M.—Symbol for "magnetic moment."
m.—A symbol for the strength of a pole of a magneto.

Mn.—Symbol for "manganese."

m. e. p.—An abbreviation of "mean effective pressure."

mm.—An abbreviation of "millimetre."

m. m. f.—An abbreviation of "magneto motive force."

m. o. v.—An abbreviation of "mechanically operated valve."

m. p. h.—An abbreviation of "miles per hour."

μ.—A symbol for "permeability" and for "micron."

μμ.—A symbol for the millionth part of a millimetre.

Mabbet, F. A.—191 Main St., Rochester, N. Y. (Cadillac, Oldsmobile.)

Macadam.—A roadway made of small broken stone laid on either a soft or hard substratum. See Telford.

Macbeth-Evans Glass Co.—Pittsburg, Pa. Mfrs. lamp reflectors.

MacFarland-Powell Auto Co.—1618 Glenarm St., Denver, Colo. (Pope-Hartford.) Cap. \$25,000. F. L. MacFarland, Pres.; Fred M. Powell, Vice-Pres. and Mgr.; J. P. Evans, Sec.; E. N. MacFarland, Treas.

Machine.—An assemblage of inter-related movable parts, forming an appliance for transmitting and modifying forces and the motion produced by them. A force employed to move a machine is a "motor." The moving force in a machine is called the "power." The place of its appliance is the "point of application;" the line in which such point tends to move is the "direction of the power;" the resistance to be overcome, the weight;" and that part of the machine immediately applied to the resistance, the "working point."

Machine-element.—A single part of a machine. See Member.

Machine, Flying.—An apparatus differing from the balloon in the fact that it is not only propelled, but supported by its own actively exerted energy. The attempts of inventors to imitate this method of self-support and flight by human power have been numerous.

Machine-screw.—See Screw, Machine.

Machine Electric Supply Co.—117 N.

Mulberry St., Muncie, Ind. (Mitchell, Maxwell, National.)

Machinery Forging Co.—Hamilton and Marquette Sts., Cleveland, O. Mfrs. drop forgings, machine work to order, screw machine products.

Machine Rijwiel en Automobielenfabrick Simplex.—Overtoom 85, Amsterdam, Holland. Mfrs. Simplex motorcycles.

Machinery.—Pub. at 49 Lafayette St., New York City.

Machining.—A general term for processes carried out by machine-tools, such as planing, shaping and milling in metal work.

Mackeller, Henry.—Overbrook, Pa. Garage.

MacIlroy, Wm. H.—Sec. De Barres Automobile Co., 1968 Broadway, New York City.

MacInnis, D. A. & J. C.—120 Michigan St., Toledo, O. Repairing.

Mackay, D. C.—Pur. Agt., Matheson Motor Car Co., Wilkes-barre, Pa.

Mackay, Heinen & Co.—San Antonio, Tex. (Holsman.)

Mack Bros. Motor Car Co.—949 Broadway, New York City. Garage.

Mack Bros. Motor Car Co.—Allentown, Pa. Makers of the Manhattan truck and passenger car; first marketed July, 1902. Cap. \$300,000. Thos. Rush, Pres.; J. M. Mack, Vice-Pres.; J. S. Mack, Treas.; Leo. Schimpff, Sec.; J. M. Mack, Gen. Mgr., Designer. Supt., Pur. Agent; W. S. Stevenson, Sales and Advt. Mgr. Agents and dealers: Chelsea Auto Storage Co. 520 W. 37th St., New York City. The Hackett Motor Car Co., 218 Paterson St., Paterson, N. J. D. W. Hughes, 1001 Chestnut St., Philadelphia, Pa. Mack Bros. Mfg. Co., 540 Atlantic Ave., Brooklyn, N. Y.

Mack, H. A.—206 E. Market St., Lima, O. (Buick, Cadillac, Franklin.)

Mack Mfg. Co., Thos. A.—401-407 St. Paul Ave., Jersey City, N. J. Mfrs. screw machine products, stampings.

Mackey, G. A.—Mgr. factory, National Auto Top Co. Main office, 1904 Broadway; factory, 244-50 W. 49th St., New York City.

Mackin, M.—Director Neer Air Cooled Engine Co., Plain City, O.

Mackintosh, Hemphill & Co.—Pittsburg, Pa. Mfrs. steel castings.

MacLean-Brandon Oil & Supply Co.—65 Long Wharf, Boston, Mass. Mfrs. oils.

MacLean, H.—Sec. Michigan Bolt & Nut Works, foot Mildrum Ave., Detroit, Mich.

MacMahon, W. A.—Partner in firm Crane & MacMahon, 8 Bridge St., New York City.

MacNamara, Lewis Petrie.—Importer B. Waverly, N. Y., June 23, 1875. Ed. college. Mem. Bayside Yacht Club. Res., Bayside, L. I. Office, 1591 Broadway, New York City. In the trade since 1899. One of the original incorporators and stockholders of Smith & Mabley, and Gen. Mgr. to Sept., 1905. Paris Mgr. to Oct., 1906, when he left to take over Renault Agency.

MacNamara, Lewis P.—1591 Broadway, New York City. (Renault.) U. S. agent for Audineau & Cie, body builders, Paris, France. Est. 1899.

MacNaughtan Company, James.—29 W. 42nd St., New York City. Makers of the Hercules electric commercial cars; first marketed November, 1905. Cap. \$100,000. James MacNaughtan, Pres., and Treas.; F. J. Wells, Engineer.

MacNish Auto Co.—3667 Olive St., St. Louis, Mo. (Queen, Ford, Rambler, National.)

Macomber, Frank Grant.—Automobile editor Hartford Globe, Hartford, Conn. B. North Manchester, Ind., Oct. 20, 1873. Ed. public and high schools. Two years Union College.

Macon Automobile Club.—H. L. Lamar, Jr., Sec., Macon, Ga.

Macourek, F. S.—Pur. Agt. Peerless Motor Car Co., 93d and Quincy Ave., Cleveland, O.

Macquart et fils et Cie.—Route de Corbeil, Montgeron, Seine-et-Oise, France. Mfrs. motorcycles.

Macrae, Hector.—316 St. Paul St., Baltimore, Md. Mfr. storage batteries.

Macular-Parker Co.—Boston, Mass. Mfrs. miscellaneous wearing apparel.

MacWilliam, George McIntosh.—Pres. and Gen. Mgr. Darracq Motor Car Co. B. Aberdeenshire, Scotland, Oct. 3, 1872. Ed. public schools, Calais, Me.; Eastman Business College, Poughkeepsie, N. Y. Special courses, evening in New York City. Director Darracq Motor Car Co., Michelin Tire, American Agency, Inc. Mem. A. C. A., N. Y. Motor. St. Andrew's Society, Maine Society. Res., 65 Prospect St., East Orange, N. J. Office, 1989 Broadway, New York City. In the trade since 1902. Used first car 1903. Organized and headed Michelin Tire American Agency, Inc., 1905. Recreation, automobiling.

Madden, H. S.—Sec., Treas. and Mgr.

Noye Mfg. Co., 50 Lakeview Ave., Buffalo, N. Y.

Madigin, J. Wilford.—Officer Crofton Storage Battery Co., 423-25 W. Queen St., Toronto, Canada.

Madison Automobile Garage.—116 S. Pinckney St., Madison, Wis. (Ford, Reo.) Est. 1901. L. F. Schoelkopf, Prop. Garage, 20 cars; repairing; battery charging.

Madison-Kipp Mfg. Co.—Madison, Wis. Mfrs. oil pumps.

Madison Square Garage.—231 E. 33d St., New York City. Garage.

Magee, G. M.—Huron, S. Dak. (Buick.)

Magie Bros.—9-11 N. Canal St., Chicago, Ill. Mfrs. grease, oils, automobile body polishes.

Magliola e figli.—10 via Mazzani, Biella, Italy. Mfrs. bodies.

Magna Garage.—Holyoke, Mass. (Buick, Stevens-Duryea.)

Magnard et Cie.—Fourchambault, Nièvre, France. Mfrs. steam commercial automobiles.

Magne, Auguste.—Moulins, Allier, France. Mfrs. wearing apparel, fur coats.

Magnet.—A piece of metal capable of exerting and being acted upon by magnetic force. A magnet is either "natural" when, like the lodestone, it is found naturally, or "artificial," when magnetism has been given to it by placing it in the field of another magnet or in that caused by an electric current.

Magneta Actiengesellschaft.—Zürich, Switzerland. Mfrs. high tension magnets.

Magnet Cement & Dressing Co.—878 N. 48th St., Philadelphia, Pa. Mfrs. tire cement.

Magnetic Clutch.—See Clutch, Magnetic.

Magnetic Cycle.—See Cycle, Magnetic.

Magnetic Field.—A space through which magnetic lines of force run, and in which, therefore, a force is exerted on any magnetic pole which may be placed there.

Magnetic Induction.—See Induction, Magnetic.

Magnetic Lag.—See Lag, Magnetic.

Magnetic Plug.—A make-and-break spark-plug in which the separation of the terminals is effected by the action of a magnet contained in the plug.

Magnetic Saturation.—See Saturation, Magnetic.

Magnetic Valve.—See Valve, Magnetic.

Magnetism.—The science which deals with the properties of magnets and magnetic fields. (2) The state or condition giving rise to the properties of a magnet.

Magnetization.—An operation which consists in communicating a certain quantity of magnetism to a bar of steel

in order to convert it into an artificial magnet. All such processes of magnetization are by "induction," i. e., the development of a certain magnetic field in the bar to be magnetized.

Magnetization, Intensity of.—Called also "field intensity." A measure of magnetic strength based upon the idea of magnetic poles and action at a distance. It is numerically equal to magnetic moment divided by volume. See Moment, Magnetic.

Magnetizing Force.—See Force, Magnetizing.

Magneto.—A mechanical generator of electricity based upon the electro-magnetic induction produced in the field of

on the armature, and no coil is employed. The break in the current at the spark-plug occurs just as the intensity of the current reaches its maximum.

In the other low-tension system a commutator is employed in connection with the magneto, and the current can be broken at any time desired, and not necessarily at the time when the height of the electric wave is reached.

The first of the high-tension systems uses an armature having two windings instead of one, a primary of coarse wire, and a secondary of fine wire, which is wound around the primary. The magneto is provided with a mechanical or magnetic "breaker," which is used for

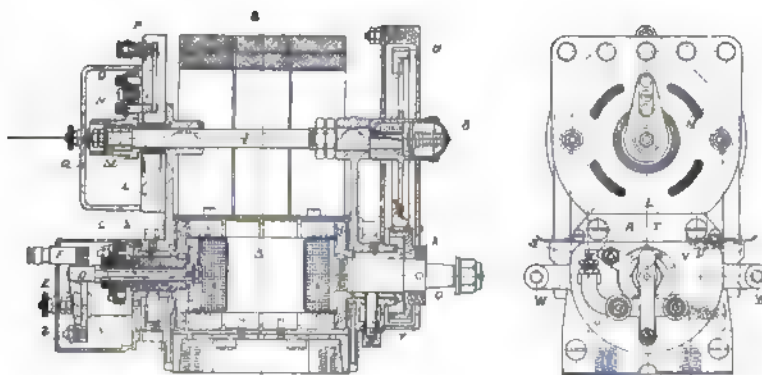


Fig. 1

a magnet. A magneto consists of two essential parts—of an armature and an inductor

The inductor of a magneto consists of permanent magnets that generate a magnetic field even in a state of absolute rest. This is the essential difference between a magneto and a dynamo, in which the inductor is an electro-magnet. The armature may be defined as a coil of conducting wire rotating in the magnetic field created by the inductor. The armature of both types of generators consists of a piece of soft iron provided with lengthwise grooves in which the wire is wound, the winding being contrary to that of the thread on a spool. The current produced by the magneto is of an alternating nature, but is converted into a direct or continuous current by means of a commutator on the armature shaft.

In automobilism magnetos are employed for firing the gaseous mixture. There have been two forms of magneto-electro ignition in use, low-tension or make-and-break, representing the older, and the high-tension magneto system, which has been developed within five years. These two forms are again divided into two systems.

In the first system, of the low-tension form, there is only a primary winding

obtaining the inductive effect in the secondary winding. For the operation of this device no coil is necessary. Some of the magnetos that employ this system are the Simms-Bosch, Splitdorf and Gianoli. The second high tension makes use of a low-tension magneto that supplies a current to an induction coil provided with a mechanical contact-breaker, which breaker in the primary produces the inductive effect in the secondary winding of the coil. On this general principle is modeled the Eisemann-Lavalette ignition system. The essential parts of this system and their relation to each other is shown in Fig. 1. The lines of magnetic force are produced by permanent steel magnets which are clamped to the cast iron pole-pieces between which the armature rotates. At the time of the greatest potential in the armature the current is broken by contact-breaker, which is actuated by cam, and a current of high potential or voltage is induced in the secondary winding of the transformer coil.

It will be noted that the points of the contact-breaker are in contact except for the brief instant when separated by the action of the point of the cam on the lever. It is obvious that the armature winding is short-circuited upon itself except at the time when the points are so

separated. The armature of the winding being thus short-circuited, there will be no generation of current. When the points are separated, there is a sudden flow of current through the primary winding of the transformer coil, which induces a secondary current of high potential in the other winding. This secondary current is conducted to the distributor-arm of the distributor which is then in contact with one of the four segments of the distributor-plate and which are in turn connected with the various spark-plugs. There may be any number of these segments on the distributor, the only change being necessary is that the break take place more rapidly between the contact breaker points, which may

thus be closed at any time when the external circuit has too strong a resistance. In this way the coil becomes protected.

The actual construction of the Eismann-Lavalette magneto is shown in Fig. 2, which gives a longitudinal cross section and view of the mechanism. The parts as indicated by the lettering are as follows: A, armature; a, armature windings; B, permanent magnets; C, copper bolt; D, carbon brush for primary current; E, spring for carbon brush D; F, terminal for primary current; G, small distributor driving-pinion; H, distributor driving-gear; I, distributor-shaft; K, grease-cup for distributor-shaft; L, distributor-plate or base, composed of an insulating material; M, high-tension dis-

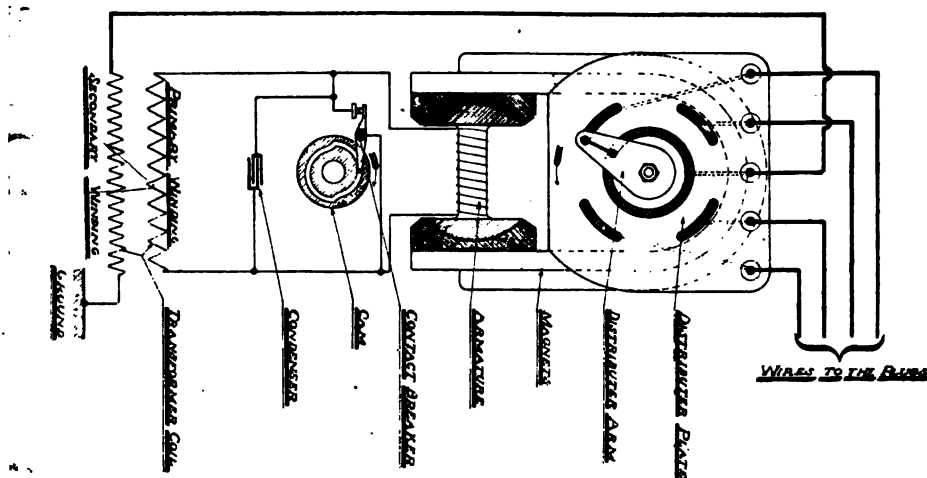


Fig. 2

be accomplished in various ways. The condenser shown (Fig. 3) is coupled in multiple with the primary wires, so as to absorb the spark which would otherwise occur between the contact-breaker points, and be liable to burn and pit them, which would seriously affect the operation of the magneto.

If, owing to imprudence, too great a continuity of secondary current has been produced (for instance, if the conducting wire of the plug which it has to feed, and which should keep sparking with the rest of the cylinders, has become loosened, or if a secondary circuit becomes accidentally broken), the secondary circuit will have no path open to it and will endeavor to pass on a way with less resistance and sometimes get across the insulating-paper of the coil and render it useless. In order to prevent such accidents, there is placed on the coils a fitting called a "safety spark gap," which consists of two pointed brass fingers, fixed on the terminals of the coil and directed toward, but separated 7 or 8 mm. from, each other. The secondary current will pass over these 7 to 8 mm. and

tributer-arm; N, carbon brush for distributor-arm and spring; O, steel brush for distributor-arm with spring; P, terminal for high-tension current from secondary winding of transformer coil; Q, cover for high-tension distributor; R, contact-breaker; S, platinum contact points; T, safety contact-spring; U, pole-pieces; V, steel cam; W, advance lever; X, main bearings; Y, wicks for lubricating main shafts; Z, cover for make-and-break mechanism.

The functions of the various parts are as follows: The shuttle-shaped soft iron armature, A, revolves in a magnetic field which exists between the pole-pieces U, which are attached to the permanent steel magnet B. This armature is provided with a number of silk insulated copper wire windings (a) one end of which is fastened to the armature core, the other end being attached to the copper bolt C, which passes through the armature-shaft, and is electrically insulated therefrom. The carbon brush D is in electrical contact with the head of this bolt. When the armature A revolves, an alternating current is gener-

ated in the copper windings (a), alternating at each 180 degrees of a revolution and attaining its maximum twice during a revolution. This alternating current is alternately opened and closed at the contacts S by the contact lever B. This contact-lever is operated by the steel cam V. When the platinum contact-points, S, are opened an impulse passes through the primary winding of the transformer coil, and generates by induction a high-tension current in the secondary winding of the same. This current is conveyed to the high-tension distributor, L M, which is mounted on the magneto and is thus distributed among the various cylinders, in which the high-tension current flashes at predetermined instants at the respective spark-plugs, in the form of a hot, fat spark. A condenser, which forms part of the transformer coil, and is well insulated, receives the extra current generated at the interruption of the platinum contact-points, and intensifies the ignition spark.

In Fig. 3 is illustrated the latest model of the Eisemann-Lavalette magneto, which is adapted not only for motor car, but also motor-boat use, and has likewise proved very serviceable for motor-cycle ignition. See Dynamo.

Magneto-ignition.—See Ignition and Magneto.

Magnolia Metal Co.—113-115 Bank St., New York City. Mfrs. various brands of anti-friction and babbitt metals. Cap. \$300,000. Est. 1886. E. C. Miller, Vice-Pres. and Gen. Mgr.; F. Jordan, Sec. and Treas.; E. C. Robson, Asst. Sec.; L. D. Allen, Western Mgr.; Fisher Bldg., Chicago, Ill.; J. H. Hutchins, Mgr., 31 St. Nicholas, Montreal, Can.; Dwight Hixcox, Pacific Coast Rep., Mchts. Exchange, Bldg., San Francisco, Cal.

Magoon Motor Co., R. H.—2174-80 9th St., S. E., Cleveland, O. (Pope-Toledo.) Supplies; garage; repairing.

Magraw, W. M. F.—249-51 N. Broad St., Philadelphia, Pa. (Autocar)

Maguire Co., J. W.—745 Boylston St., Boston, Mass. (Pierce Arrow.)

Maguire & Co., T. D.—Cincinnati, O. (Cartercar.)

Maher Garage Co.—120-122 W. 22d St., Toledo, O. Garage.

Mahlke Machine & Mould Works, R.

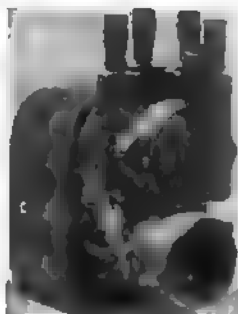


Fig. 3

H.—15th St., Wheeling, W. Va. (Stearns, Pope-Hartford.)

Mahoning Motor Repair Co.—26-28 Warren Ave., Akron, O. Repairing.

Mahoning Rubber Co.—Youngstown, O. Mfrs. pneumatic tires.

Main Belting Co.—40 Pearl St., Buffalo, N. Y. Mfrs. belting.

Maine Motor Carriage Co.—Cor. Free and South Sts., Portland, Me. (Haynes, Pope-Hartford, Stevens-Duryea.) Supplies; garage; repairs.

Main-shaft.—See Shaft, Main.

Maison des Sports.—46 rue du Midi, Brussels, Belgium. Mfrs. wearing apparel; fur hats, caps and coats.

Maison, Gérard.—15 Place de la République, Paris, France. Mfr. wearing apparel; coats.

Maison, Talbot.—156 Ave. Malakoff, Paris, France. Mfrs. shock absorbers.

Maja Co., Ltd., American Branch.—230 W. 58th St. New York City. E. B. Galaher, Mgr. (Maja.)

Makarof, John A.—2436 Michigan Ave., Chicago, Ill. Repairing.

Make-and-Break Ignition.—See Ignition.

Make - and - Break, Magnetic.—See Spark-plug, Magnetic.

Malcolm, Thomas.—Pres. Riverside Steel Casting Co., 451-473 Riverside Ave., Newark, N. J.

Malcomson, A. S.—Vice-Pres. Franklin H. Kalbfleisch Co., Broadway and 16th St., New York City.

Malcomson, A. Y.—Pres. and Treas. Aerocar Motor Co., Mack and Beaufait Aves., Detroit, Mich.

Malden Automobile Club.—H. K. Frost, Sec., Malden, Mass.

Malden Automobile Co.—121 Madison St., Malden, Mass. Garage.

Malicet et Blin, Etablissements.—103 Ave. de la République, Aubervilliers, France. Mfrs. ball bearings, steering, differential and transmission gears.

Maljournal et Bourron.—11 Croix-Jordan, Lyons, France. Mfrs. primary batteries.

Malleability.—Capability of being wrought under the hammer, a property belonging to many of the metals in an eminent degree and upon which largely depends their utility. The most malleable, in order of softness, are lead, tin, gold, zinc, silver, copper, platinum and iron. But gold may be beaten thinner than any other metal. It can be hammered so thin that the thickness of a million leaves will be less than an inch.

Malleable Iron Fittings Co.—Branford, Conn. Mfrs. malleable iron castings, steel castings.

Mallet, E.—10 rue Denis-Papin, Tours, France. Mfrs. Auto-fauteuil tricarcs.

Mallison, J. M.—62 John St., Utica, N. Y. Garage.

Mallon, J.—Shop Foreman, Palmer & Singer Mfg. Co., 1620-24 Broadway, New York City.

Mallory Bros. & Steward.—Parkersburg, W. Va. (White.)

Malone, Wm. Arnold.—Supt. Garage, Empire State Motor Car Co., 2148 Broadway, New York City.

Maloney, Philip M.—Sec. and Treas. The North Pennsylvania Iron Co., 3d and Venango Sts., Philadelphia, Pa.

Maloney, Philip S.—Pres. The North Pennsylvania Iron Co., 3d and Venango Sts., Philadelphia, Pa.

Malpass, Geo. U.—Sec., Treas. Geo. W. Nock Co., Inc., 126 N. 4th St., Philadelphia, Pa.

Malrady, E. F.—Director W. S. Littlefield Mfg. Co., 134 Eliot St., Boston, Mass.

Maltby, A. E.—Mgr. Winton Motor Carriage Co., 246-48 N. Broad St., Philadelphia, Pa.

Maltby Automobile & Mfg. Co.—Brooklyn, N. Y. Mfrs. brakes.

Maltby, D. F.—Westbury, N. Y. Garage.

Maltby, W. S.—Plainfield, N. J. (Corbin.)

Mambret et Cie.—25 rue de la Montagne-Ste.-Genevieve, Paris, France. Mfrs. primary batteries.

Mammoth Garage Co.—Mamaroneck Ave. and Post Road, White Plains, N. Y. Garage. (Ford.)

Manchester Auto Co.—Main St., Manchester, Ia. (Jackson, Enick, Northern, Cadillac, Pope-Waverley, Reo, Columbia, Franklin.) Est. since 1906. Garage, 25 cars; repairing.

Manchester Auto Garage.—61 N. Main St., Manchester, Conn. (Lambert.)

Manchester Auto Garage.—50 Granite St., Manchester, N. H. (Buick, Columbia, Oldsmobile.)

Manchester Auto Machine Co., Ltd.—1516 Locust St., Allegheny, Pa. Garage.

Manchester, P. E.—Vice-Pres. National Motor Vehicle Co., E. 22d St., Indianapolis, Ind.

Manchester Tire Co.—Oxford Road, Manchester, England. Mfrs. pneumatic tires.

Mandery, Jos. J.—Prop. Rochester Automobile Co., 158 South Ave., Rochester, N. Y.

M. & A. Basket Co.—239 E. 27th St., New York City. Mfrs. hampers.

M. & M. Mfg. Co.—Akron, O. Mfrs. tire cement, patches and treads.

Man, F. J.—Mgr. Automobile Accessories Dept., Republic Belting & Supply Co., 1616 W. 3d St., Cleveland, O.

Mandrel.—A general term for a cylindrical piece on which work can be mounted for operation in a lathe. (2) The spindle or headstock of a lathe.

Manecke, H. R.—Decatur, Ill. Garage.

Manganese.—A lustrous reddish-gray metal of the atomic weight 55. It is stable in contact with the air only when pure, and decomposes water at 212° F. (100° C.)

Manganese, Binoxide.—Binoxide of manganese exists in a natural state (pyrolusite) crystallized in prisms, having the luster of silver. Its powder, called "black oxide of manganese," is black. Mixed with plumbago it is used in automobilism as a depolarizer, in the formation of dry batteries.

Manganese Bronze.—See Bronze.

Manganese, Ferro.—See Ferro-Manganese.

Mangham, John W.—Care Spalding Cotton Mills, Griffin, Ga. (Maxwell.)

Manhasset Shipbuilding & Repair Co.—Port Washington, L. I. Mfrs. motor boats.

Manhattan Auto Storage & Garage.—541 W. 52d St., New York City. Garage. automobile covers and tops, glass wind shields.

Manhattan Auto Top & Body Co.—249 W. 64th St., New York City. Mfrs. automobile covers and tops, glass wind shields.

Manhattan Brass Co.—332 E. 28th St., New York City. Mfrs. brass parts and fittings, moulding, etc., automobile lamps, horns. Est. 1865. Gilbert M. Smith, Pres. and Treas.; Jonathan H. Crane, Vice-Pres.; Frank A. Seibert, Sec.

Manhattan Electrical Supply Co.—17 Park Pl., New York City. Mfrs. dry batteries, bells, spark coils.

Manhattan Lamp Works.—530 W. 28th St., New York City. Mfrs. acetylene generators, lamps.

Manhattan Motor Car Co.—1329 Michigan Ave., Chicago, Ill. (Acme.)

Manhattan Rubber Co.—18 Vesey St., New York City. Mfrs. rubber mats.

Manhattan Screw & Stamping Works.—West End Ave. and 67th St., New York City. Mfrs. automobile lamps and generators, exhaust horns, adjustable tire brackets, oil guns, pumps, flexible tubing, screens. Cap. \$200,000. Est. 1902. Samuel Wilner, Pres.; Louis F. Leland, Vice-Pres. and Treas.; Elias R. Wilner, Sec. and Gen. Mgr.

Manhattan Storage Co.—1611 Broadway, New York City. Mfrs. and jobbers automobile supplies, tools, wearing apparel, tires, tire brackets, lamp brackets, robe rails, foot rests, trunk racks. Est. 1890. D. Grinberg and A. Morris, Props.; Chas. Gomprecht, Mgr. branch, 53 Nassau St., New York City.

Manifatture Martiny.—90 Corso Umberto Primiero, Rome, Italy. Mfrs. pneumatic tires.

Manifold.—A tube, usually of cast metal, with one or more flanges or screw-threaded outlets for pipe-connections, used in cases where it is desired to convey steam, water, air or



gas from a large pipe into several smaller ones. (a) One of the inlet and exhaust pipes of an internal combustion motor. See Bus-pipe.

Mankato Automobile Club.—Chas. M. Masters, Sec. Mankato, Minn.

Manley Bros.—Rear Brooks House, Brattleboro, Vt. (Ford, Rambler, Jackson.)

Manley Bros.—Harvard, Ill. (Queen, National.)

Manley, D. V. R.—Pres. and Gen. Mgr. National Cement & Rubber Mfg. Co., 3053-5-7-9 Monroe St., Toledo, O.

Manlove Gate Co.—272 E. Huron St., Chicago, Ill. Mfrs. automatic driveway gates. Not Inc. Est. 1900. G. B. Manlove, Prop. and Mgr.

Manlove, G. B.—Owner and Mgr. Manlove Gate Co., 272 E. Huron St., Chicago, Ill.

Mann, A. J.—Pres., Sec., Treas. and Gen. Mgr. Long & Mann Co., Beehive Bldg., Graves St., Rochester, N. Y.

Mann, A. S.—Pres. Long & Mann Co., Beehive Bldg., Graves St., Rochester, N. Y.

Mann Co., Leon.—699 Broadway, New York City. Mfrs. wearing apparel, coats.

Mann, W. F.—Yonkers, N. Y. (Waltham.)

Manning, A. C.—Interlaken, N. Y. (Holsman)

Manning, E. H.—Gen. Mgr., The E. H. Manning Transmission Co., 307-308 Monger Bldg., Elkhart, Ind.

Manning, E. J.—Monroe, Wis. (Holsman.)

Manning Forge Tool Co.—Mannington, W. Va. Repairing.

Manning Mfg. Co.—Holyoke, Mass. Mfrs. tire shoes.

Manning Transmission Co., The E. H.—307-308 Monger Bldg., Elkhart, Ind. Mfrs. double and single friction transmissions. Cap. \$100,000. Est. Dec., 1906. E. H. Manning, Gen. Mgr.

Manograph.—An apparatus for taking indicator diagrams of a gas-motor. There are several types of the instrument in the market, one of which, the Schultze manograph, is shown in the accompanying figure. The diagram is traced by a beam of light reflected upon a ground glass by a mirror, which oscillates at the same time on both a vertical and horizontal axis. A small Nernst lamp supplies the light to the manograph, and as this type of lamp requires an alternating current, the latter is generated by means



of a magneto driven by a small direct-current dynamo and connected in circuit with the lamp, through a rheostat. The movement of the mirror upon its vertical axis, which traces the horizontal line, is obtained from the 2-to-1 cam-shaft, by means of bevel-gear driven rods, which make the same number of revolutions per minute as does the crank-shaft, and causes the mirror to oscillate by means of a suitable cam. The oscillation of the mirror upon its horizontal axis is obtained by means of the impulses of the gases upon a diaphragm in the box. The impulses given the diaphragm cause the mirror to reflect the beam of light in a vertical direction, thus indicating the pressure obtained in the cylinder at any given part of the stroke. The instrument makes it possible to see indicated the variations in pressure from any cause whatever, and is a most valuable appurtenance for the proper testing of any type of internal combustion engine.

Manometer.—An instrument for measuring the elastic force of gases or vapors. Depending on the manner of balancing the pressure, there are "open-air manometers," those which balance the weight of a column of liquid (water or mercury) in an open tube; "compressed-air manometers," where the pressure is balanced by that of the air confined in a closed tube; and "metall'c manometers," which use the elastic deformation of a closed tube or a diaphragm of thin metal. See Pressure Gauge.

Manross, A. N.—Designer Corbin Motor Vehicle Corp., New Britain, Conn.

Mansfield & Son, W. H.—Koleen, Ind., and Bloomfield, Ind. (Maxwell, National.)

Mansfield Auto & Supply Co.—64 N. Walnut St., Mansfield, O., and Ashland, O. (Buick, Cadillac.)

Mansfield Mfg. Co.—Pittsburg, Pa. Mfrs. brass pipe fittings.

Mantovani, Carlo.—88 via Saluzzo, Turin, Italy. Mfr. motorcycles.

Manuel Bros.—Richford, Vt. (Elmore, Cadillac.)

Manuel, G. M.—Edmonton, Alberta Can. (Buick.)

Manufacture Française d'Armes et Cycles de Saint Étienne.—St. Étienne Loire, France. Mfrs. motorcycles.

Manufacturers' Can Co.—132-36 Mulberry St., Newark, N. J. Mfrs. oil cans, tanks.

Manufacturers' Foundry Co.—Waterbury, Conn. Mfrs. gray iron castings, machine work to order, patterns.

Manufacturers' Motor Car Co.—54 W. 43d St., New York City. Garage.

Manufacturers' Selling Co.—1777 Broadway, New York City. Mfrs. rubber cloth, cloth and carpet trimmings.

Manufacture Suisse de Vélocipèdes.—Courfaivre, Switzerland. Mfrs. motorcycles. (Condor motorcycles.)

Manzel, A.—Sec. Manzel Bros. Co., 317-19 Babcock St., Buffalo, N. Y.

Manzel Bros. Co.—317-319 Babcock St., Buffalo, N. Y. Mfrs. force feed lubricators. Cap. \$30,000. Est. 1896. Inc. 1906. H. J. Manzel, Pres. and Treas.; A. Manzel, Sec.

Manzel, H. J.—Pres. and Treas. Manzel Bros. Co., 317-319 Babcock St., Buffalo, N. Y.

Maplebay Mfg. Co.—Crookston, Minn. Mfrs. gasoline automobiles; tire treads.

Maple City Mfg. Co.—Monmouth, Ill. Mfrs. oil cans.

Marble Auto Garage, W. H.—69 Main St., Brockton, Mass. (Columbia, Locomobile, Cadillac, Knox, Winton.) Garage; repairs; supplies.

Marblehead Yacht Yard.—Marblehead, Mass. Mfrs. motorboats.

Marceau, P.—10 rue Camille-Desmoulins, Levallois, Seine, France. Mfr. make-and-break plugs.

Marcel, R.—239 bvd. Pereire, Paris, France. Mfr. automobile motors.

Marcellis et fils.—10 rue de Moresnel, Liège, Belgium. Mfrs. tire pumps.

March, A. A.—904 Benton Blvd., Kansas City, Mo. (Holzman.)

Marchand-Dufaux, Fabbrica Italiana di Vettura Automobili.—Plaisance, Italy. Mfrs. motorcycles, tricars, motorcycle and automobile motors. (Marchand-Dufaux.)

Marchesi, Enrico.—Gen. Mgr. Fiat Automobile Co. (Fabbrica Italiana Automobile Torino), Turin, Italy.

Marck frères.—Rue Hoyoux, Herstal, Belgium. Mfrs. motorcycle motors.

Marconi Wireless Telegraph Co.—18 Finch Lane, London, E. C., England. Mfrs. coils.

Mar-Del Mobile Co.—Charles St. and Mt Royal Ave., Baltimore, Md. (Packard, Franklin, Cadillac, Pope-Waverley, Gallia, Northern, Elmore.)

Marine Eng. & Mach. Co.—Harrison, N. J. Mfrs. motorboats.

Marine Glue.—See Glue, Marine.

Marine Iron Works.—Beaumont, Tex. (Maxwell.)

Marine Supply Co.—San Pedro, Cal. (Reo.)

Marion Auto Co.—Marion, O. (Maxwell, Ford, Mora, Reo, Rambler.)

Marion, J. Q.—519 San Antonio St., El Paso, Tex. (Waltham, Reading Standard motorcycles.) Est. Nov., 1903. Repairing.

Marion Mfg. Co.—Franklin, Pa. Mfrs. torch heaters, oils.

Marion Motor Car Co.—W. 15th St., and Big Four Ry., Indianapolis, Ind. Mfrs. gasoline automobiles and gasoline commercial vehicles.

Mark, Davis.—Ravenna, O. (Reo.)

Mark Mfg. Co.—Evanston, Ill. Mfrs. wrought iron and steel pipe.

Marks, Arthur A.—Vice-Pres. The Diamond Rubber Co., Akron, O.

Marlborough St. Auto Exchange.—6 Marlborough St., Newport, R. I. Garage.

Marlin, J. D.—Vice-Pres. Gilbert Mfg. Co., New Haven, Conn.

Marline.—A small rope made of two strands loosely twisted together and used for winding around ropes, cables, etc.

Marline-spike.—A tapering sharp-pointed pin used in marling, separating strands of rope in splicing, etc.

Marcusse, J. B.—30 rue du Moulin, Brussels, Belgium. Mfrs. bodies.

Marr, W. L.—Designer Buick Motor Co., Flint, Mich.

Marriott, Fred H.—An American racing driver

whose greatest performance was on the Florida Beach, between Ormond and Daytona. In February, 1906, driving a steam car, he made the present mile record of 28.15 seconds and won in the heavy-weight class, kilometer record trials, in 182.5 seconds.

Marron, J. E.—Supt. Eclipse Machine Co., Elmira, N. Y.

Mars Fahrradwerke Actiengesellschaft-Doo.—Nürnberg, Germany. Mfrs. motorcycles. (Mars motorcycles.)

Marsh, Edw. W.—Sec. Spring Perch Co., 232 John St., Bridgeport, Conn.

Marshall, A. P.—Officer Leather Tire Goods Co., 1325 Boylston St., Newton Upper Falls, Mass.

Marshall Chemical Co.—80 William St., New York City. Mfrs. metal polishes.



Marshall, Edw.—1221 Baltimore Ave., Kansas City, Mo. Garage.

Marshall House.—York, Me. (Reo, Premier.)

Marshall, S. J.—Treas. Globe Malleable Iron Co., Greenway Ave., Syracuse, N. Y.

Marshall, W. H.—Pres. American Locomotive Automobile Co., Providence, R. I.

Marshall, Wm. F.—Mgr. Tarkio Electric & Water Co., Tarkio, Mo.

Martensite.—A solution of iron carbide in iron, and which occurs in the hardest steel.

Martin & Anson Co.—2226 Indiana Ave., Chicago, Ill. Mfrs. air pumps, compressed air outfits. Est. 1902.

Martin & Co., H. G.—179 Aborn St., Providence, R. I. (Rapid.)

Martin & Son, C. Y.—209-211 Main St., Santa Ana, Cal. (Maxwell, Ford, Moline.) Est. Jan., 1906. C. Y. Martin, Mgr.; Glenn L. Martin, Salesman and Demonstrator. Garage, 24 cars; repairing.

Martin Auto Co.—Hutchinson, Kan. (Northern.)

Martin Automobile Co., F. L. C.—3204 Park Ave., Plainfield, N. J. (Franklin, Mercedes, Clement-Bayard, Stevens-Duryea.) Garage; repairing.

Martin, C. F.—Bellefontaine, O. (Northern, Cadillac.)

Martin, C. H.—31 W. 42d St., New York City. (Atlas runabout.)

Martin, C. Y.—Mgr. C. Y. Martin & Son, 209-11 Main St., Santa Ana, Cal.

Martin, Dr. Truman J.—Physician and surgeon. B. Allentown, Pa., Jan. 1, 1857. Ed. Lafayette College, class 1874; University of Pennsylvania, 1877. Pres. Commercial Publicity Corp., Pres. United Gas & Oil Development Co. Mem. A. C. A., Buffalo A. C. (Ex-Pres.), Chicago A. C., Buffalo (N. Y.) Athletic. Aero C. A., N. Y. Office, 919 White Bldg., Buffalo, N. Y. Used first car 1897, Columbia Stanhope.

Martin Dunning Auto Garage Co.—538 E. 18th St., Paterson, N. J. (Pullman, Crawford.)

Martin et Lethimonnier.—32 rue Felicien-David, Paris, France. Mfrs. automobile motors, gasoline automobiles. (Sultan.)

Martin Evans Co.—1186 Bedford Ave., Brooklyn, N. Y. Mfrs. tire cement, inner tubes, anti-skid devices.

Martin, Fred K.—Perth Amboy, N. J. (Monarch.)

Martin, Geo. P.—Pres. Spear Martin Fur Co., 41 Church St., Burlington, Vt.

Martin, G. L.—Salesman and Demonstrator, C. Y. Martin & Son, 209-11 Main St., Santa Ana, Cal.

Martin, Jos.—Peekskill, N. Y. (Maxwell.)

Martin, L.—Place Pereire, St. Germain-en-Laye, Seine-et-Oise, France. Mfr. transmission gears.

Martin, L. G.—3923 Forbes St., Pittsburgh, Pa. (Rambler.)

Martin, M. J.—Partner and Mgr. Geo. A. Hawes, 73 Pine St., New York City.

Martin, Thomas Commerford.—Editor Electrical World since 1883; author, lecturer. B. London, England, July 22, 1856. Ed. in England. Associated with Edison in lab., 1877-79. Special expert U. S. Census Office, 1900-07. Author The Electric Motor and Its Applications, Inventions, Researches and Writings of Nikola Tesla. Mem. and Past. Pres. Am. Inst. Elec. Engineers and N. Y. Elec. Soc.; Director Soc. for Suppression of Unnecessary Noises. Mem. Com. Robert Fulton Monument Assn. Life mem. Iron and Steel Inst. Hon. mem. Nat. Elec. Light Assn. Mem. English Inst. Elec. Engineers, N. Y. Acad. Sciences, Franklin Inst., Municipal Art Soc., Nat. Civic Federation. Mem. clubs: A. C. A., Engineers'. Res., 40 Morningside Ave. Address, 114 Liberty St., New York City.

Martin, T. W.—Vice-Pres. Mora Motor Car Co., Newark, N. Y.

Martin, Walter C.—Mgr. Rolls Royce Import Co., 1875 Broadway, New York City.

Martin, W. E.—Soepp St., Bethlehem, Pa.

Martin's Garage.—Long Branch, N. J. (Cadillac.)

Martini Automobile Co., Ltd.—St. Blaise and Frauenfeld, Switzerland. Mfrs. gasoline automobiles. (Martini.) Gasoline commercial automobiles.

Martini Import Co.—239 W. 50th St., New York City. (Martini.) Est. 1904. Cap. \$50,000. Jos. E. Freeman, Pres.; Percy S. Palmer, Sec. and Treas.; F. D. Palmer, Vice-Pres.; W. F. Murphy, Sales Mgr.; Chas. Joel, Master Mechanic; C. Kerrigan, Chief Demonstrator. Repairing.

Martinsburg Automobile Club.—X. Poole, Sec., Martinsburg, W. Va.

Martinsburg Auto Repair & Storage Co.—118 S. Queen St., Huntington, W. Va. Repairing.

Martland Automobile Co.—152 12th St., San Francisco, Cal. (Glide.)

Martyn's Auto Repair Station, D. J.—53 E. 124th St., New York City. Garage.

Marvel Mfg. Co.—15½ Virginia Ave., Indianapolis, Ind. Mfrs. carbureters.

Marx & Rawle.—98 William St., New York City. Mfrs. anti-freezing solutions.

Maryland Auto Co.—Lafayette and Carrollton Ave., Baltimore, Md. (Knox, Calvert.)

Maryland Sheet & Steel Co.—Cumberland, Md. Mfrs. sheet iron and steel.

Maryland State Automobile Assn.—Baltimore, Md. Osborne I. Yellott, Pres., Calvert Bldg., Baltimore, Md.; H. M. Rowe, 21 W. Fayette St., Baltimore, Md., Vice-Pres.; F. W. Darling, Pikesville, Md., Sec.; W. S. Belding, Baltimore, Md., Treas. Membership Automobile Club of Baltimore City, Automobile Club of Maryland, Baltimore County Motor Club, Hagerstown Automobile Club, Motor Car Racing Assn.

Machinenbau Actiengesellschaft.—Leipzig, Germany. Mfrs. clutches.

Maschinenfabrik Prometheus.—Berlin-Reinickendorf, Germany. Mfrs. differential and transmission gears.

Machinen und Wagenaufabriks Actien Gesellschaft.—Semmering, Austria. Mfrs. gasoline automobiles. (M. W. F. cars.)

Masetti e Fontana.—7 via San Stefano, Reggio-Emilia, Italy. Mfrs. motorcycles.

Maslen, Geo. S.—Sales Dept. National Auto Co., 957 Main St., Los Angeles, Cal.

Mason & Co., C. V.—Bristol, Conn. (Autocar.)

Mason & Somers, W. R.—822 Victoria Bldg., St. Louis, Mo. (Columbus.)

Mason, A. H.—Mgr. and Vice-Pres. Mason Car Sales Co., 3130 Main St., Kansas City, Mo.

Mason, A. L.—Pres., Treas. and Gen. Mgr. Newport Engineering Works, 359-65 Thames St., Newport, R. I.

Mason, A. S.—Pres., Treas. and Gen. Mgr. Newport Engineering Works, 359-65 Thames St., Newport, R. I.

Mason Automobile Exchange.—163 Broadway, Newburg, N. Y. (Franklin.)

Mason Car Sales Co.—3130 Main St., Kansas City, Mo. (Mason.) Est. 1906. Cap. \$10,000. D. B. Munger, Pres. and Treas.; A. H. Munger, Vice-Pres.; C. B. Copeland, Sec. and Mgr.

Mason, Chas. F.—Vice-Pres. Mason's Carriage Works, 124 E. 4th St., Davenport, Ia.

Mason City Auto Club.—Mason City, Ia. Org. March 26, 1907. Charter members: A. J. Zingre, J. F. Emery, J. G. Wolfe, F. E. Keeler, A. G. Spokes, B. H. Brett, Geo. Hughes, B. F. Weston, W. A. Babcock, S. L. Randall, F. A. Stephenson, D. E. Moulton, B. C. Way, James E. Moore, J. W. Irons, Hathorn Auto Co. Officers: F. E. Keeler, Pres.; Wm. H. Hathorn, Sec. and Treas.; J. F. Emery, Chairman Good Roads Committee; A. J. Zingre, Chairman Committee on Organization.

Mason, C. S.—Sumter, S. C. (Cadillac.)

Mason, D. B.—Mgr., Pres. and Treas.

Mason Car Sales Co., 3130 Main St., Kansas City, Mo.

Mason, Earl P.—Sec., Supt. and Mechanical Eng. Newport Engineering Co., 359-65 Thames St., Newport, R. I.

Mason, E. L.—Vice-Pres. Newport Engineering Works, 359-65 Thames St., Newport, R. I.

Mason, E. S.—Vice-Pres. Newport Engineering Works, Newport, R. I.

Mason, Ernest.—Malone, N. Y. (Reo.)

Mason, Jacob W.—283-285 Halsey St., Newark, N. J. (Maxwell.)

Mason, John A.—312-316 Washington St., Newton, Mass. Mfrs. automobile tops, baggage racks, trunks, tool boxes, robe rails, tool rolls, leather goods of all kinds. Est. 1906.

Mason, John L.—Pres. Mason's Carriage Works, 124 E. 4th St., Davenport, Ia.

Mason, L. W.—Sec. and Treas. Mason's Carriage Works, 124 E. 4th St., Davenport, Ia.

Mason Motor Car Co.—E. 5th and Vine Sts., Des Moines, Ia. Mfrs. gasoline automobiles. (Mason cars.)

Mason Regulator Co.—158 Summer St., Boston, Mass. Mfrs. steam engines, brass pipe fittings.

Mason Wrench & Tool Co.—First National Bank Bldg., Chicago, Ill. Mfrs. wrenches.

Mason's Carriage Works.—124 E. 4th St., Davenport, Ia. (Winton, Cadillac, Northern, Thomas Flyer, Pope Waverley.) Est. 1865. Cap. \$25,000. Jno. L. Mason, Pres. and Head Carriage Dept.; Chas. F. Mason, Vice-Pres. and Head Auto Dept.; W. L. Mason, Sec. and Treas. Garage, 25 to 30 cars; repairing.

Mass.—That which remains unchanged in all the transformations which a body may undergo. Mass must not be confounded with weight, which is simply the effect produced by the attraction of gravitation on a body. This varies with the latitude, since the earth is not perfectly round. The weight of a body is not the same at the pole as at the equator.

The British unit of mass is the standard pound avoirdupois (7,000 grains). The French unit of mass is called a gramme (15.43235 grains). It is the mass of a cubic centimetre of distilled water at 4° C. Thus the unit of mass is directly connected with the unit of length. There is no similar simple relation between the units of length and mass in the English system; a cubic inch of water weighs 252.88 grains. From a practical viewpoint, "mass" is used whenever it is a question of estimating a motion, a speed, or the intensity of a force. "Weight," on the contrary, is used when it is a question of directly estimating a work or a power.

Massachusetts Auto Co.—52 Church St., Boston, Mass. Garage.

Massachusetts Automobile Club.—W. A. Rolfe, Sec., 761 Boylston St., Boston, Mass.

Massachusetts Chemical Co.—Walpole, Mass. Mfrs. insulating paints, varnishes, friction tapes, rubber moulded goods.

Massachusetts State Automobile Assn.—Boston, Mass. Elliot C. Lee, Brookline, Mass., Pres.; J. P. Coughlin, Worcester, Mass., VicePres.; J. C. Kerrison, Boston, Mass., Treas.; James Fortescue, 282 Dartmouth St., Boston, Mass., Sec.; Membership Automobile Club of Springfield, Bay State Automobile Assn., Brockton A. C., Malden A. C., Wauchusett Automobile Club, of Fitchburg; Worcester A. C.

Massachusetts Steel Casting Co.—West Everett, Mass. Mfrs. steel castings.

Massenat, André.—Civil Engineer, Gen. Mgr. Panhard & Levassor (American Branch). B. Paris, France, Aug. 18, 1875. Mem. clubs: A. C. A., N. Y. Athletic, Columbia Yacht. Office, 1881 Broadway, New York City. In automobile and motor boat trade since 1900. Used first car in 1896. Panhard, 4 hp.

Massey, F. L.—First Vice-President Massey Machine Co., Pearl St., Watertown, N. Y.

Massey, G. B. 2d.—Pres. and Treas. Massey Machine Co., Pearl St., Watertown, N. Y.

Massey, Geo. B.—Pres. Excelsior Carriage Co., Main St., White River Junction, Vt.

Massey Machine Co.—Pearl St., Watertown, N. Y. Est. 1903. Mfrs. gasoline engine cylinder castings, gray iron castings. G. B. Massey, Pres. and Treas.; F. L. Massey, Vice-Pres.; W. G. Massey, Sec.

Massey, W. G.—Sec. Massey Machine Co., Pearl St., Watertown, N. Y.

Massey Auto & Bicycle Co., W. J.—Vancouver, Can. (Rapid, Rambler.)

Massillon Motor Car Co.—76 S. Erie St., Massillon, O. (Ford.)

Massnick Mfg. Co.—1567 River St., Detroit, Mich. Mfrs. special automobile machinery, machine work to order.

Masury & Son, John W.—44-50 Jay St., Brooklyn, N. Y. Mfrs. enamel, paints, varnishes.

Matchless Metal Polish Co.—94 Mar-

ket St., Chicago, Ill. Mfrs. metal polish.

Matheny, Geo. H.—Sarasota, Fla. (Waltham.)

Mather Corporation, C. B., The.—56 Merrimac St., Newburyport, Mass. Mfrs. motorboats.

Matheson Agency.—Pittsburg, Pa. (Berliet, Matheson.)

Matheson Co.—92 Massachusetts Ave., Boston, Mass. (Matheson.)

Matheson Co. of California.—434 Golden Gate Ave., San Francisco, Cal. (Matheson.)

Matheson Co. of Maryland.—Continental Bldg., Baltimore, Md. (Matheson.)

Matheson Co. of New Jersey.—9 Clinton St., Newark, N. J., and 147-151 Main Ave., Passaic, N. J. (Matheson.)

Matheson, Charles W.—Pres. Matheson Motor Car Co. B. Grand Rapids, Mich., March 22, 1876. Ed. Grand Rapids High School, graduate 1895. Director Matheson Motor Car Co. Mem. clubs: A. C. A., A. C. Wilkesbarre, Westmoreland, Franklin, of Wilkesbarre, Pa. Res., 56 Butler St., Dorranceton, Wilkesbarre, Pa. Office, Wilkesbarre, Pa. In trade since Nov., 1902. Used first car July, 1902.

Matheson, Frank F.—Sec. Matheson Motor Car Co. B. Kalmazoo, Mich., June 27, 1871. Ed. Grand Rapids High School, graduate University of Michigan. Director Matheson Motor Car Co. Mem. clubs: Wilkesbarre, Westmoreland, Franklin, of Wilkesbarre, Pa. Res., 459 S. River St., Wilkesbarre. Office, Wilkesbarre, Pa. In trade since March, 1903.

Matheson, Geo. H.—Purch. Agt. National Motor Vehicle Co., E. 22d St., Indianapolis, Ind.

Matheson Motor Car Co.—Wilkes-Barre, Pa. Makers of the Matheson car; first marketed in 1898. Five models made since. Cap. \$1,100,000. C. W. Matheson, Pres.; John Welles Hollenback, Vice-Pres.; F. F. Matheson, Sec.; R. Nelson Bennett, Treas.; C. R. Greuter, Designer and Mechanical Engineer; Ross Anderson, Supt.; D. C. Mackay, Pur. Agent. Agents and dealers: Albany Garage Company, Albany and Troy, N. Y. Binghamton Motor Car Company, Binghamton, N. Y. Empire Garage Company, Middletown, N. Y. Keats Automobile Co., Seattle, Wash. Long Branch Automobile Company, Long Branch, N. J. George Mason, Newburgh, N. Y. Matheson Company of Boston, Boston, Mass. Matheson Company of California, San Francisco, Cal. Matheson Company of Maryland, Baltimore, Md. Matheson Company of New Jersey, Newark, N. J. Rochester Automobile Company, Rochester, N. Y. Schellentrager, E. J., Pittsburg, Pa. Scranton Garage and Motor Company, Scranton, Pa. South Side Automobile Company, St.

Louis, Mo. Strauss Bros. & Company, Ligonier, Ind. Titman, Leeds & Co., Philadelphia, Pa. Watertown Automobile and Supply Company, Watertown, N. Y. White-Savage Co., Salt Lake City, Utah. Williams, R. O., Columbus, O. Williamsburg Automobile & Storage Company, Brooklyn, N. Y.

Mathews Auto Co., C. S.—514-516 Jackson St., Topeka, Kan. (Ford.)

Mathews, G. A.—Sec., Treas. and Pur. Agt. Jackson Automobile Co., Jackson, Mich.

Mathewson Auto Co.—1624 Broadway, Denver, Colo. (Columbia, Thomas Flyer, Oldsmobile, Woods.)

Mathews, T. A.—Pres. and Treas. N. Y. and N. J. Lubricants Co., 14 and 16 Church St., New York City.

Mathis, C. W.—Arkansas and Arctic Ave., Atlantic City, N. J. (Cadillac.)

Mathis und Co., E. E. C.—25 Finksmattstrasse, Strassbourg, Germany. Mfrs. gasoline automobiles. (Mathis cars.)

Mattise Mfg. Co.—411-13 E. 107th St., New York City. Mfrs. lamp reflectors.

Matthews Boat Co.—Port Clinton, O. Mfrs. motorboats.

Matthews Mfg. Co., H. A.—Seymour, Conn. Mfrs. cups and cones, stampings.

Matthews Motor Co.—Camden, N. J. Mfrs. gasoline automobiles.

Mattice, A. M.—Gen. Mgr. of Works. Walworth Mfg. Co., 128-136 Federal St., Boston, Mass.

Maudslay Motor Co.—Coventry, England. Mfrs. marine motors.

Maurier, M.—55 rue Picot, Toulon, France. Mfrs. detachable rims.

Mauvais Motor Car Co.—489 Golden Gate Ave., San Francisco, Cal. (Heine-Velox.)

Maw & Co., Jos.—Market Sq., Winnipeg, Can. (Rapid, Franklin, Oldsmobile, Reo.)

Max Motor Car Co.—13 Dorrance St., Providence, R. I. (Maxwell.)

Max, Société des Accumulateurs.—33 rue Perrier, Levallois-Perret, France. Mfrs. storage batteries.

Max, Wormser.—25 rue Vivienne, Paris, France. Mfrs. wearing apparel, fur hats, caps and coats.

Maxant fils, Léon.—38 rue Belgrand, Paris, France. Mfrs. horns, gauges.

Maxfield & Co., Glen C.—170 E. Madison St., Chicago, Ill. Mfrs. wearing apparel; caps.

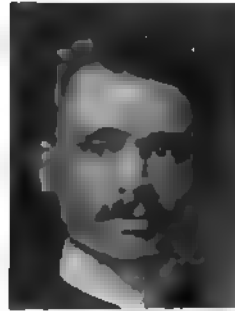
Maxfield & Rice Bros.—1401 Hennepin Ave., Minneapolis, Minn. (Haynes.)

Maxim & Goodridge.—550 Prospect Ave., Hartford, Conn. Makers of the Maxim-Goodridge electric car, to be marketed about April 1, 1908.

Maxim, C. W.—Middleboro, Mass. (Autocar.)

Maxim, Hiram Percy.—Mechanical engineer and automobile manufacturer.

B. Brooklyn, N. Y., Sept. 2, 1869. Ed. Brooklyn schools and Massachusetts Institute Technology. Graduate class 1886, School of Mechanic Arts. Mem. clubs: Engineers', A. C. A., A. C. of Hartford, Aero C. A., A. C. of Pittsburgh, Assoc. Mem. American Institute Elec. Engineers, Society Auto Engineers.



Institution Auto Engineers, London, England. Res., 550 Prospect Ave., Hartford, Conn. Office, Maxim & Goodridge, Hartford, Conn. In trade since 1895. In 1895 used Maxim motor tricycle, later Columbia. Designer of Columbia line of electric and gasoline pleasure cars and commercial trucks. Recreations, automobile racing, fishing, hunting, tennis, golf.

Maxim, M. W.—Market Sq., Paris, Me. (Waltham.)

Maxson, Irving F.—Sales Mgr. Aero-car Motor Co., Mack and Beaufait Ave., Detroit, Mich.

Maxson Vulcanizing Works.—125 W. Main St., Rochester, N. Y. Mfrs. vices.

Maxwell Agency.—Columbus, O. (Maxwell.)

Maxwell & Fitch Co.—218 S. Washington St., Rome, N. Y. Mfrs. gas and gasoline engines, carburettors. Cap. \$25,000. Est. 1903. Reorganized April 1, 1907. L. M. Fitch, Pres.; G. N. Lehr, M. D., Vice-Pres.; Thomas Steele, Sec., Treas. and Gen. Mgr.

Maxwell & Co., L. R.—Cedar Rapids, Ia. Mfrs. jacks, tire tools.

Maxwell Auto Agency.—Manchester, N. H. (Maxwell.)

Maxwell-Briscoe Boston Co.—121 Mass. Ave., Boston, Mass. (Maxwell.) Cap. \$100,000. Repairing.

Maxwell-Briscoe Buffalo Co.—1407 Goodrich St., Buffalo, N. Y. (Maxwell, Mora.)

Maxwell-Briscoe Chase Co.—1407 Michigan Ave., Chicago, Ill. (Maxwell, Marmon, Columbus Electric.) Est. 1905. Cap. \$100,000. Benj. Briscoe, Pres.; J. D. Maxwell, Vice-Pres.; A. S. Johnson, Sec.; Richard Irvin, Treas.; A. F. Chase, Gen. Mgr. Garage, 30 cars. Repairing.

Maxwell-Briscoe-Chase Co.—3968 Olive St., St. Louis, Mo. (Maxwell.)

Maxwell-Briscoe, Inc.—317-319 W. 59th St., New York City. (Maxwell.) Est. 1903. Benj. Briscoe, Pres.; Richard Irvin, Treas.; N. C. Pardee, Gen. Mgr. and Sec.

Maxwell-Briscoe-McLeod Co. — 243 Jefferson Ave., Detroit, Mich. (Maxwell, Mitchell.)

Maxwell-Briscoe Motor Co.—Tarrytown, N. Y.; New Castle, Ind.; Pawtucket, R. I. Makers of the Maxwell car; first marketed in 1904. Cap. \$1,500,000. Benj. Briscoe, Pres. and Gen. Mgr.; J. D. Maxwell, Vice-Pres. and Gen. Supt., also designer; F. D. Dorman, Sec.; Rich. Irvin, Treas.; Walter B. Horn and E. J. Corbett, with the above, Directors; J. B. Meyers, Supt.; A. R. Gormuller, Purch. Agent; A. B. Barkman, Sales Manager. Branches: Maxwell-Briscoe Boston Co.; Maxwell-Briscoe, Inc., New York City; Maxwell-Briscoe Buffalo Co.; Maxwell-Briscoe McLeod Co., Detroit, Mich.; Maxwell-Briscoe Chase Co., Chicago, Ill.; Maxwell-Briscoe Willcox Co., Los Angeles, Cal. Maxwell dealers: Appleby & Dill, Spotswood, N. J. Atlas Auto Co., 5850 Ellsworth Ave., Pittsburg, Pa. Sub-Agents: (C. H. Hartley, Waynesburg, Pa. Auto Garage Co., Meyersdale, Pa.) Automobile Livery & Express Co., 1010 Tacoma Ave., Tacoma, Wash. Baugher, J. L., Baldwin and Central Aves., Staunton, Va. Britton, R. D. & C. O., 121 Allyn St., Hartford, Conn. Brown & Pinney, Stafford Springs, Conn. Brown & Schmidt, 100 Lee Place, Paterson, N. J. Brown, Burt, Malone, N. Y. Browne, Geo. D. W., Passaic, N. J. Bubb, Amos, Glen Rock, Pa. Sub-Agents: (Adams, W. J., Hanover, Pa.) Central Auto Co., 170 Central Ave., Albany, N. Y. Sub-Agents: (Hubbel Bros., Kelley's Corners, N. Y.) Central Auto Co., 839 Chapel St., New Haven, Conn. Sub-Agents: (D. B. Wilson Co., 13 Broadway, Waterbury, Conn.) Cortland Specialty Co., Cortland, N. Y. Curt & Adams, 420 Spruce St., Scranton, Pa. Eastern Automobile Co., 17 University St., Montreal, Can. Sub-Agents: (Hamilton Garage Co., Hamilton, Ontario, Canada. McKenzie, A., Smiths Falls, Ontario, Canada. McCurdy, Dr., Coatcook, Quebec, Canada. Lamy, Nap, Three Rivers, Quebec, Canada.) Elizabeth Motor Car Co., Elizabeth, N. J. Sub-Agents: (Morris Bros. Auto Co., Plainfield, N. J. Boland Bros., Rahway, N. J.) Empire Auto Co., Greenwich, Conn. Sub-Agents: (Huss, Henry, Jr., 48 Valentine St., Mt. Vernon, N. Y. Wallace Bros. Co., 46 Main St., New Rochelle, N. Y. Werner, Geo. J., Rye, N. Y. Stinemetz, Fred, Port Chester, N. Y. West End Auto & Machine Co., 72 W. Main St., Stamford, Conn.) Freeman, F. N., Gouverneur, N. Y. Fisher Auto Co., 330 N. Illinois St., Indianapolis, Ind. Sub-Agents: (Machine Electric Supply Co., Muncie, Ind.; Newby, J. A., New Castle, Ind.; La Grange, J. W., Franklin, Ind.; Wooden & Bowen, Rush-

ville, Ind.; Fellwock Roll & Panel Co., Evansville, Ind.; Terre Haute Auto Co., Terre Haute, Ind.; Murphy & Cooly, Hartford City, Ind.; Model Machine Works, Frankfort, Ind.; Mansfield, W. H. & Son, Bloomfield, Ind.; Albright Auto Co., Crawfordsville, Ind.; Siefert, E. W. & Co., Shelbyville, Ind.; Draper & Whitsell, Richmond, Ind.; Griffin Motor Car Co., Fort Wayne, Ind.; Fitchard, H. L. & Co., 9 Columbia St., Utica, N. Y.; Futer, B. Franklin, 213 N. Duke St., Lansyth St., Jacksonville, Fla.; Gorman, J. H., Pottsville, Pa.; Grover, W. H., 99 Cove St., Norfolk, Va.; Hackensack Auto Co., Main St., Hackensack, N. J.; Sub-Agents: (Van Wart, J. W., Englewood, N. J.; Smith, N. J. & F. C., Ridgewood, N. J.; Hamm & Ross, Charlotte, N. C.; Sub-Agents: (Everhart, H. C., Taylorsville, N. C.; Rogers, F. O., Concord, N. C.; McFadden, V. B. & Son, Rock Hill, S. C.; Earl & Carpenter, Worths, N. C.); Hawkey & Kelder, 34 Market St., Poughkeepsie, N. Y.; Herbst, Frank, 110 S. 2nd St., Wilmington, N. C.; Hiestand, Dr. Daniel, 140 N. 7th St., Allentown, Pa.; Holt, Eugene, Burlington, N. C.; Hornburg, C. H., Auto Co., 214 Post St., Spokane, Wash.; Horton, E. P., 2 Mamaroneck Ave., White Plains, N. Y. Sub-Agents: (W. G. Barrett, Katonah, N. Y.; Croft, W. H., Peekskill, N. Y.) Irvin, Richard & Co., 25 Broad St., New York City. (Sub-Agents: Peckham, F. W., Motor Syndicate, 40 Sackville St., Picadilly, London, England.) Jeffords, Witherspoon, 58 Queen St., Charleston, S. C.; Jenkins, E. A. Motor Co., Columbia, S. C.; Johnston, Robert, 12 N. Main St., Wilkes Barre, Pa.; Kelsey Motor Car Co., 204 N. Broad St., Philadelphia, Pa.; Keystone Motor Car Co., 1099 Market St., Harrisburg, Pa.; Kirkham, I. C., Bedford Ave. and Fulton St., Brooklyn, N. Y. Sub-Agents: (Arthur & Flessel, Huntington, Whitcomb Auto Co., Lynbrook, Long Island, N. Y.; W. C. Gray, Patchogue, Long Island, N. Y.; C. Duttman, Amityville, Long Island, N. Y.; Chas. R. Fitz, Southampton, Long Island, N. Y.; A. Porrier, Garden City, Long Island, N. Y.; E. Moutoux, Riverhead, Long Island, N. Y.) Lewis, S. H., Binghampton, N. Y.; Mangham, Jno. W., care of Spalding Cotton Mills, Griffin, Ga.; Mason, J. W., 283 Halsey St., Newark, N. J. Sub-Agents: (Case, S. W., 41 Park St., Montclair, N. J. Max Motor Car Co., 13 Dorrance St., Providence, R. I.; Maxwell-Briscoe, Inc., 317 W. 59th St., New York City. Sub-Agents: (Rose, E. B., 537 Mercer St., Jersey City, N. J.; Cornell, W. M., West New Brighton, Staten Island, N. Y.) Maxwell-Briscoe Boston Co., 121 Massachusetts Ave., Boston, Mass. Sub-Agents: (Stoughton & Folkin Co., Portland, Me.; Darling Auto Co., Auburn, Me.; Fifield Bros., Augusta,

Me.; Treat & Clark, Bangor, Me.; H. C. Weaver, Portsmouth, N. H.; Maxwell Auto Agency, Manchester, N. H.; Keene Auto Cycle Co., Keene, N. H.; C. A. Jackson, Lebanon, N. H.; Brown & Wright, St. Johnsbury, Vt.; Milford Auto Machine Co., Milford, Mass.; Jewett, B. M., Claremont, N. H.; King, Chas. H., Bridgewater, Mass.; Lord, Dr. L. W., West Ossipee, N. H.; Parcher, L. Herbert, Gardner, Mass.; Perkins & Corliss, Gloucester, Mass.; Roemer, Emil, Webster, Mass.; Merrit T. White, Springfield, Mass.; Merrill, T. White, Springfield, field, Mass.; Hill Motor Car Co., Haverhill, Mass.; Ingall Garage, Newburyport, Mass.; La France, A., Marlboro, Mass.; Caswell Auto Co., Lowell, Mass.; Perry, F. W., Taunton, Mass.; Loring Motor Car Co., Brockton, Mass.; Burrington Motor Co., Holyoke, Mass.; Auto Selling & Supply Co., 15 4th St., New Bedford, Mass.). Maxwell-Briscoe Buffalo Co., 26 Goodrich St., Buffalo, N. Y. Sub-Agents: (A. M. Zimbrich, 45 South Ave., Rochester, N. Y.; Hilts & Kennedy, Batavia, N. Y.; G. S. Wallace, Port Allepany, Pa.; G. B. Christ, Niagara Falls, N. Y.; Hawkins & Pembroke, Erie, Pa.; Atkinson Auto Co.; Lockport, N. Y.; W. M. Sperry, Leroy, N. Y.). Maxwell-Briscoe Chase Co., 1407 Michigan Ave., Chicago, Ill. Sub-Agents: (W. R. Deemster Machinery Co., Kansas City, Mo.; M. M. Dodge, Valparaiso, Ind.; A. F. Chase & Co., 418 3rd Ave., S. Minneapolis, Minn.; Robert Smythe, Rock Island, Ill.; C. F. Louk, Jefferson, Ia.; E. F. Sanger, Milwaukee, Wis.; Peper Auto Co., 3922 Olive St., St. Louis, Mo.; Fernald Auto Co., 1548 Broadway, Denver, Colo.; Lincoln Auto Co., Lincoln, Neb.; J. L. Meredith, Elburn, Ill.; Wichita Auto Co., Wichita, Kas.; Marine Iron Works, Beaumont, Tex.; Fancher & Morris, Salt Lake City, Utah; Amarillo Auto Co., Amarillo, Tex.; H. McDonald, Valley City, N. D.; Norbeck & Nicholson, Redfield, N. D.; Cycle & Auto Supply Co., Davenport, Ia.; B. Cool, Salem, Kas.; Roy Pierson, Janesville, Wis.; H. L. Downey, Calgary, Alta, Canada; S. T. Beale, Paw Paw, Ill.; H. C. Griep, Carthage, Mo.; Alberta Motor Co., Medicine Hat, Alta., Canada; M. M. Baker & Co., Peoria, Ill.; W. H. Paddock, Holdrege, Neb.; B. Cooley, Galena, Kas.; Cedar Rapids Auto Supply Co., Cedar Rapids, Ia.; Sutter & Gamble, Burlington, Ia.; W. F. Wortham, Waco, Tex.; Louk & Compton, 1808 Farnam St., Omaha, Neb.; Birdsong & Potchernick, San Antonio, Tex.; Moore Fuel & Feed Co., Bisbee, Ariz.) Maxwell-Briscoe McLeod Co., 243 Jefferson Ave., Detroit, Mich. Sub-Agents: (Maxwell Agency of Columbus, 152 N. 9th St., Columbus, O.; F. J. Harrington, Newark, O.; W. A.

Biddle, Richwood, O.; H. S. Hulse, Circleville, O.; Reliance Machine Co., Warren, O.; John E. Van Wye, Willis, O.; Wm. O. Harlow, Kalamazoo, Mich.; Reliance Motor Car Co., 216 E. 3rd St., Cincinnati, O.; J. A. Kirkpatrick, Lebanon, O.; J. P. Beck, 196 James Ave., Saginaw, Mich.; A. W. McClure, Ann Arbor, Mich.; Luce & Banks Co., Grand Rapids, Mich.; Wert Motor Car Co., Van Wert, O.; G. C. Kalbfleisch, Tiffin, O.; Marion Auto Co., Marion, O.; Ed. E. Sweeney, Nashville, Tenn.; Birmingham Garage, Birmingham, Ala.; Dayton Auto Co., Dayton, O.; American Auto Co., 18 St. Clair Ave. N. E., Cleveland, O.; Longest Bros., Louisville, Ky.; Central Carriage & Auto Co., Toledo, O.; Gunthorpe & McKean, Mobile, Ala.; Youngstown Auto & Repair Co., Youngstown, O.; A. Hanson, Alpena, Mich.; Oliver & Kempf, Pontiac, Mich.; V. L. Nettleton, Coldwater, Mich.; Wieder Harness Co., Calumet, Mich.; D. T. Kiess, Edon, O.; W. J. Glenn, Kenton, O. (Maxwell-Briscoe Willcox Co., 1211 S. Main St., Los Angeles, Cal. Sub-Agents: (G. C. Thomas, Pomona, Cal.; R. E. L. Morton, Hanford, Cal.; Coop Bros., Riverside, Cal.; E. R. Braley, Pasadena, Cal.; Wood-Redington Machinery Co., Santa Barbara, Cal.; Varney & Coulthurst, Long Beach, Cal.; Martin & Son, C. Y., Santa Ana, Cal.; San Luis Auto & Machine Co., San Luis Obispo, Cal.; T. F. Griswold, Covina, Cal.; Santa Monica Garage, Santa Monica, Cal.; Sharps Garage, Bakersfield, Cal.; E. C. Johnson, Compton, Cal.; F. C. Moore, San Bernardino, Cal.; Casa Loma Garage, Redlands, Cal.; Kessler Machine & Supply Co., San Diego, Cal.; W. E. Mercer, Ventura, Cal.; Linz-Sanborn Auto Co., 505 Golden Gate Ave., San Francisco, Cal.; Pelton Grissel Auto Co., Fresno, Cal.; Wright & West, Stockton, Cal.; Western Motor Car Co., Sacramento, Cal.; Mr. Schilling, Santa Rosa, Cal.; Frank Wulff, Colusa, Cal.; California Auto Co., Oakland, Cal.; Motor Car Repair Co., 408 Orange St., Wilmington, Del.; Murdock Bros., Oneonta, N. Y.; Norton, R. D., Hightstown, N. J.; Ring, M. B., 11 Chestnut St., Norwich, Conn.; Sandt, Geo. M., Red Bank, N. J.; Sexton, C. A., Perth Amboy, N. J.; Shenango Valley Auto Co., Sharon, Pa.; Shipman, Ralph, Sunbury, Pa.; Smith, Geo. E., Cohoes, N. Y.; Simth, John E., Easton, Pa.; Stagg, Stephen, 1308 W. Broad St., Richmond, Va.; Syracuse Auto & Supply Co., 118 S. State St., Spracuse, N. Y.; Thomas, J. R., 1028 Connecticut Ave., Washington, D. C.; Trimmer, Dr. E. D., High Bridge, N. J.; Virginia Motor Car Co., Roanoke, Va.; West Coast Auto Co., 1008 Florida Ave., Tampa, Fla.; Weygant, Wm. M., Tuxedo Park, N. Y. Sub-Agents: (T. S.

Murray, Chester, N. Y.; R. F. Weygant Sons, Central Valley, N. Y.). Yonkers Auto Station, 71 S. Broadway, Yonkers, N. Y.

Maxwell-Briscoe-Wilcox Co.—1211 S. Main St., Los Angeles, Cal. (Maxwell.)

Maxwell Bros.—20 Church St., Roanoke, Va. Repairing.

Maxwell, G. D.—Sec. and Treas. The Perfection Reversing Gear & Supply Co., 45 Vesey St., New York City.

Maxwell, J. B.—829 14th St., Washington, D. C. (Aerocar.)

Maxwell, J. D.—Vice-Pres. and Director Maxwell-Briscoe Motor Co., Tarrytown, N. Y., and New-castle, Ind. Designer Maxwell cars. Director Willyoung Appliance Co., Yonkers, N. Y. Vice-Pres. the Maxwell-Briscoe-Chase Co., Maxwell-Briscoe Boston Co.,

Maxwell-Briscoe-McLeod Co., Maxwell-Briscoe, Inc., New York City, and other selling companies. Gen. Supt. Maxwell factories.



May, Henry.—Vice-Pres. and Mgr. The G. N. Pierce Co. B. Germany, March 19, 1861. Mem. A. C. of Buffalo. Res. 42 Woodlawn Av., Buffalo, N. Y. Office, Buffalo, N. Y.

May, Louis.—Sec. and Treas. The Frantz Body Co., cor. Stanton Ave. and Gety St., Akron, O.

May, Orr.—Purch. Agt. Ideal Mfg. Co., Portsmouth, O.

Maybach, Guillaume.—Cannstadt, Wurtemberg. B. Feb. 9, 1846. Technical manager of the Société

des Daimler-Motoren Gesellschaft, at Untertuerkheim, Wurtemberg, Honorary member of the Société Automobile Technique of Berlin. Former Chief Engineer of the Gasmotoren-Fabrik Deutz (1872 - 1882).



Builder of the Mercédés automobile.

Maye, C. E.—Red Lion, Pa. Garage.

Maye & Lindeman.—92 Ward St., Waterbury, Conn. Garage.

Mayer & Eachus.—109 Market St., West Chester, Pa. Garage.

Mayer Carburetter Co.—2673 Main St., Buffalo, N. Y. Supplies.

Mayer, H. F.—77 Washington St., Buffalo, N. Y. Belting.

Mayer, J. W.—Beatrice, Neb. (Holsman.)

Mayer, Rudolph.—151 Main St., Springfield, Mass. (Autocar.)

Maynard, A. B.—Gen. Mgr. Utica Motor Car Co., 333 Bleeker St., Utica, N. Y.

Maynard, W. A.—68 Gilbert St., New Haven, Conn. (Thomas Flyer, Autocar.)

Mayo, A. N.—Treas. The Fisk Rubber Co., Oak St., Chicopee Falls, Mass.

Mayo Damper Co.—355 Walnut St., Pottstown, Pa. Mfrs. carburetters, brass, bronze, aluminum and copper castings, motorcycles.

Mayo Radiator Co.—New Haven, Conn. Mfrs. hoods, radiators.

Maytenecht, August.—Schwerte, Germany. Mfr. chains.

Maythorn & Son.—Riggleswade, England. Mfrs. bodies.

McAneeny, W. A.—Purch. Agt. Electric Vehicle Co., 1 Laurel St., Hartford, Conn.

McArthur & Son, John.—Aberdeen, S. Dak. (Rambler.)

McAvoy, Frank J.—Supt. The London Auto Supply Co., 1229-31 Michigan Ave., Chicago, Ill.

McBean, A. L.—Sec. Milne Auto-Start Co., 919 W. Fort St., Detroit, Mich.

McBride Bros.—River St., Elgin, Ill. (Reo.)

McBride, Dr.—Rugby, N. Dak. (Mitchell.)

McBurney, Dr. B. A.—Surgeon, Austin Automobile Club, Austin, Ill.

McBurnie Auto Co.—Broadway and Jackson Sts., Louisville, Ky. (Kisselkar.)

McCalmont, A. W.—Sioux Falls, S. Dak. Garage.

McCan, Dr. W.—391 S. Main St., Geneva, N. Y. (Franklin.)

McCandlish, John.—Pres. American Steam Gauge & Valve Co., 220 Camden St., Boston, Mass.

McCann, J. N.—Eau Claire, Wis. Garage.

McCanna Mfg. Co.—56 N. Jefferson St., Chicago, Ill. Mfrs. lubricators, spark plugs.

McCarthy, D. E.—Pres. and Treas. General Mfg. Co., Elkhart, Ind.

McCartin, Geo. S.—Watertown, N. Y. Garage.

McClary, A. G.—Defiance, O. (Reo.)

McClary, H. C.—Second Vice-Pres.

Fairbanks, Morse & Co., Franklin and Monroe Sts., Chicago, Ill.

McClatchey, Meade.—71 E. Side Sq., Canton, Ill. (Rapid.)

McClellan, Chas. P.—Fall River, Mass. Mfrs. automobile tops.

McCloskey, J. S.—Christina St., Sarnia, Can. Repairing.

McClure, A. W.—Ann Arbor, Mich. (Maxwell.)

McClure, Don P.—Oskaloosa, Ia., and Ottumwa, Ia. (Buick, Columbia, Winton, Maxwell, Pope-Hartford, Pope-Waverley.)

McClure, F. A.—205 S. Cayuga St., Ithaca, N. Y. (Cadillac, Franklin.)

McClurg & Co., A. C.—215-21 Wabash Ave., Chicago, Ill. Pubs. maps and route guides, automobile book store.

McClurg, Thos.—Head of Bicycle and Sundries Dept., Colister & Sayle, 224 Superior Ave., N. W., Cleveland, O.

McCollum, A. J.—Designer 1908 Model Miami Cycle & Mfg. Co., Grand Ave., Middletown, O.

McCollum, Dr. H. E.—2d St., Laramie, Wyo. (Lambert.)

McConkey, Frank.—Canajoharie, N. Y. Garage.

McCook Auto Co.—308 W. Denison St., McCook, Neb. (Mason, Waltham.) Est. 1907. Frank Kendlen, Pres.; Chas. E. Picklum, Mgr. and Head Repair Dept.; S. C. Beach, Sales Mgr.; E. C. Churning, Head Automobile Livery Dept. Garage, 15 cars; repairing.

McCord & Co.—1400 Old Colony Bldg., Chicago, Ill. Mfrs. aluminum, carbureters, brass, bronze, aluminum and copper castings, gaskets, lubricators, oil pumps, patternmakers, circulating pumps, radiators, screw machine products, spark plugs, tire pumps.

McCord, Don C.—Oakland, Cal., and 408 Golden Gate Ave., San Francisco, Cal. (American Mercedes.) Garage.

McCormac, P. A.—Rowland, N. C. (Waltham.)

McCormick, Jr., J.—Treas. Bishop, McCormick & Bishop, 1820 Halsey St., Brooklyn, N. Y.

McCormick Sons, C. H.—Ave. C and Vanderpool St., Newark, N. J. Mfrs. leather.

McCoy, Fred V.—23 E. St., Fort Edward, N. Y. (Maxwell.)

McCoy, Geo. A.—Riverside, N. J. (Cadillac.)

McCracken, D.—Sec. and Treas. C. H. Blomstrom Motor Co., Clark and Jefferson Ave., Detroit, Mich.

McCracken, Paul B.—Vice-Pres. Racine Boat Mfg. Co., Riverside, Muskegon, Mich.

McCraw, G. P.—Pierson, Ia. (Cadillac, Northern.)

McCray, Jas. E.—Wapello, Ia. (Holsman.)

McCrea Motor Truck Co., The.—Am.

Trust Bldg., Cleveland, O. Mfrs. electric commercial automobiles.

McCreery & Sons.—1625 6th Ave., Beaver Falls, Pa. (Gale, Reo.)

McCudlock & Boswell.—Ellice Ave. and Hargrave St., Winnipeg, Manitoba, Can. (Buick, Royal.)

McCullough & Son, J. H.—219 N. Broad St., Philadelphia, Pa. Garage.

McCullough Iron Co.—Wilmington, Del. Mfrs. sheet iron and steel.

McCurdy, Dr.—Coaticoop, Quebec, Can. (Maxwell.)

McCurdy, R. P.—Sales Mgr. Banker Bros. Co., Baum and Beatty Sts., Pittsburgh, Pa.

McCutchen, Charles G.—Sole owner McCutcheon Gear & Mfg. Co., 205 W. South St., Indianapolis, Ind.

McCutchen Gear & Mfg. Co.—205 W. South St., Indianapolis, Ind. Mfrs. steering gears, steering wheels, axles, forgings and machine work to order. Est. 1906. Chas. G. McCutchen, Gen. Mgr. Selling Agents, the American Distributing Co., Cleveland, O.

McCutcheon, C. A.—Mechanical Engr. Salisbury Wheel & Mfg. Co., Jamestown, N. Y.

McCutcheon, P.—Asst. Treas. C. T. Ham Mfg. Co., 731 Oak St., Rochester, N. Y.

McDaniel, Leo.—Cairo, Ill. (Premier.)

McDaniels, S. C.—Laurens, S. C. (Waltham.)

McDiarmid, Donald.—Head Construction Dept. C. P. Kimball & Co., 315-318 Michigan Ave., Chicago, Ill.

McDonald & Morrison Mfg. Co., A. Y.—Dubuque, Ia. Mfrs. brass pipe fittings.

McDonald Auto Co.—Memphis, Tenn. (Mitchell, Holsman.)

McDonald, D. L.—Van Wert, O. (Winton, Cadillac.)

McDonald, Ed.—Taunton, Mass. (Reo.)

McDonald, Hugh.—Valley City, N. D. Garage.

McDonald, J. B.—Jacksonville, Fla. Garage.

McDonald, Titus & Co.—61 E. Spring St., Columbus, O. (Reo, Mora.)

McDougal, Natt.—Missoula, Mont. (Buick.)

McDougall Varnish Co.—1317 Elk St., Buffalo, N. Y. Varnish.

McDuffee Automobile Co.—1501 Michigan Ave., Chicago, Ill. (De Luxe, Stoddard-Dayton, Kisselkar.)

McDuffee Automobile Co.—228-238 Wisconsin St., Milwaukee, Wis. (De Luxe, Stoddard-Dayton, Kisselkar.) Cap. \$2,400.

McElroy & Co., D. W.—San Antonio, Tex. (Stoddard-Dayton, De Luxe.)

McElroy, T.—139 Walnut St., Newark, N. J. Garage.

McEwan & Dougherty.—Park River, N. Dak. Garage.

McEwen, Edwin.—Sec. and Treas. F. B. Stearns Co., Euclid and Lakeview Ave., Cleveland, O.

McFadden, Brown.—Rook Hill, S. C. (Waltham.)

McFadden & Son, V. B.—Rock Hill, S. C. (Maxwell.)

McFarland & Gumpfer.—1329 Michigan Ave., Chicago, Ill. Repairing.

McFarland, F. L.—Pres. McFarland Powell Auto Co., Denver, Colo.

McFarland, Geo.—Pres. and Gen. Mgr. Harrisburg Auto Co., 3d and Hamilton Sts., Harrisburg, Pa.

McFarlane Wagon Works.—100 W. Harrison St., Chicago, Ill. Mfrs. wood and metallic bodies.

McFieran, J. C.—1043 3d Ave., Louisville, Ky. (Pope-Toledo, Pope-Hartford.)

McGaughy, H. G.—1345 Wabash Ave., Chicago, Ill. Garage.

McGiffert, Jas.—Ashtabula, O. (Reo.)

McGovern, Thos. L.—Sec. Fort Pitt Automobile Co., Baum St. and Euclid Ave., Pittsburg, Pa.

McGowen, J. Harry.—Cincinnati, O. (Haynes.)

McGrath, W. J.—Pres. and Treas. Aetna Brass. Mfg. Co., 4800 Hamilton Ave., Cleveland, O.

McGuckin, H. M.—Prop. and owner De Kalb Auto & Garage Co., 142 W. Main St., De Kalb, Ill.

McHenry County Automobile Club.—E. C. Jewett, Sec., Woodstock, Ill.

McIntire-Willets Mfg. Co.—Monroe and Cunningham Sts., Butler, Pa. Garage.

McIntosh Auto Co., J. B., The.—199 Jefferson Ave., Detroit, Mich. Garage.

McIntosh Auto Garage.—130 W. 102d St., New York City.

McIntyre & Bros., E. L.—114 Jefferson St., Savannah, Ga. Garage.

McIntyre, F. E.—Pine Ridge, S. D. (Waltham.)

McIntyre, Geo. B.—1221 State St., Erie, Pa. (Cartercar.)

McIrwin & Walker.—Atwood, Kan. (Jewel.)

McJunkin, Paul.—Vice-Pres. York Electric & Machine Co., 30-34 N. Penn St., York, Pa.

McKay, D.—San Antonio, Tex. Garage.

McKay, E. C.—Pres. Republic Belting & Supply Co., 1616 W. 3d St., Cleveland, Ohio.

McKay, R. E.—Omaha, Neb. Garage.

McKeel Co., Geo. A.—Jackson, Mich. Mfrs. roller bearings, thrust bearings, screw machine work, pressed metal parts. Cap. \$111,000. Est. 1900. P. H. Withington, Pres.; Winthrop Withington, Vice-Pres.; Wm. Sparks, Sec. and Treas.

McKee, Sam L.—Segerin, Tex. (Waltham.)

McKeen, J. D.—Morris, Ill. (National.)

McKenzie, A.—Smith's Falls, Ontario, Canada. (Maxwell.)

McKibbin Mfg. Co.—South Norwalk, Conn. Mfrs. spark coils, electric switches.

McKinley Square Auto Co.—1369 Boston Rd., New York City. Garage.

McKinney, C. C.—Leather and brass mfg. company, 24-26 E. Genesee St., Auburn, N. Y.

McKinney, P. L.—Rep. Dept. Peerless Motor Car Co. of N. E., 178 Columbus Ave., Boston, Mass.

McKinnon Dash Co.—Buffalo, N. Y. Mfrs. license numbers.

McLachlan, A. D.—Sales Mgr. Royal Motor Car Co., Gordon Park Blvd. and Lake Shore Tracks, Cleveland, O.

McLaughlin, Chas. F.—Pres. East Liberty Automobile Co., Pittsburg, Pa.

McLaughlin, Jas. F.—Sec. and Treas. East Liberty Auto Co., Pittsburg, Pa.

McLaughlin, W. A.—Zanesville, O. (Jewel.)

McLaughlin, W. S.—Purch. Agt. Modern Tool Co., 4th and State Sts., Erie, Pa.

McLean Automobile Co.—1604 Broadway, New York City. (Lambert.)

McLeary, C. W.—Pres. T. E. McLeary Co., 51-53 Main St., Farmington, Me.

McLeary Co., F. E.—51-53 Main St., Farmington, Me. (Rambler, Ford.) Est. since 1877. Cap. \$10,000. C. W. McLeary, Pres.; F. E. McLeary, Treas. Garage. 15 cars. Repairing.

McLeary, F. E.—Treas. F. E. McLeary Co., 51-53 Main St., Farmington, Me.

McLellan, A. T.—511 Colorado St., Austin, Tex. Garage.

McLeod, A. J.—Rowland, N. C. (Cadillac.)

McLeod, F. N.—Florence, S. C. (Cadillac.)

McMaster, S. B.—Columbia, S. C. (Pope-Hartford.)

McMeikin, C. A.—Chief Draftsman Schubert Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

McMillan, P. H.—Sec. and Treas. Packard Motor Car Co., Detroit, Mich.

McMullen, Roger B.—Head Sales Dept. Hydraulic Pressed Steel Co., E. 61st St., Cleveland, O.

McNab & Harlin Mfg. Co.—56 John St., New York City. Mfrs. brass pipe fittings.

McNail Brainard Engine Co.—390 Webster Ave., Long Island City, N. Y. Mfrs. gasoline marine motors.

McNall, Arthur.—East Ave. and S. Union St., Rochester, N. Y. (Peerless, Franklin, Rauch & Lang.)

McNary Co., J. E.—1606 Machnessey Bldg., Pittsburg, Pa. (Studebaker.)

McNaught & Co.—Worcester, England. Mfrs. bodies.

McNaughton, J. F.—1126 S. Main St., Los Angeles, Cal. (Doison, Mora.)

McNaughton, James.—Pres., Treas. James McNaughton Co., 29 W. 42d St., New York City.

McNellis, Chas.—Pres. and Treas. Imperial Brass Mfg. Co., 245-247 S. Jefferson St., Chicago, Ill.

McNellis, Frank.—Vice-Pres. Imperial Brass Mfg. Co., 245-247 S. Jefferson St., Chicago, Ill.

McNiece, T. B.—Supt. Humphreys Mfg. Co., 201 E. 5th St., Mansfield, O.

McNiell, D. T.—Sec., Vice-Pres. Reeves Pulley Co., 1225 7th St., Columbus, O.

McPherson, A. M.—Santa Monica, Cal. (Reo.)

McPherson, Chas.—Foreman Inspection Dept., Eclipse Machine Co., Elmira, N. Y.

McRae & Roberts Co.—227-235 Campbell Ave., Detroit, Mich. Mfrs. brass pipe fittings, water line gauges, oil guns.

McRae, F. W.—Atlanta, Ga. (Atlas.)

Meachem, T. G.—Vice-Pres. and Sales Mgr. New Process Raw Hide Co., 500-514 Plum St., Syracuse, N. Y.

Meachem, T. W.—Pres. New Process Raw Hide Co., 500-514 Plum St., Syracuse, N. Y.

Mead, W. L.—275 Ridgewood Ave., South Orange, N. J. Repairing.

Meadowbrook Cycle Co.—137-141 Jackson St., Hempstead, L. I., N. Y. Mfrs. motorcycles.

Meadville Auto Garage.—838 Market St., Malvern, Pa. Repairing.

Mears, Chas. W.—Advt. Mgr. Winton Motor Carriage Co., Cleveland, O.

Mears, J. W.—9 Ocean Parkway, Brooklyn, N. Y. (Acme.)

Mechaley Auto Co.—30-40 Summer St., Stamford, Conn. (Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, Cadillac, White.) Supplies; garage; repairing.

Mechanical Electrical Construction Co. Philadelphia, Pa. Mfrs. gasoline marine motors.

Mechanical Energy.—See Energy, Mechanical.

Mechanical Fabric Co.—Providence, R. I. Mfrs. cushions.

Mechanically-operated Valve. — See Valve.

Mechanical Supply Co.—Mission Point Bldg., Marinette, Wis. (Rambler, Maxwell, Rapid.)

Mechanics.—The study of motion in its relations to the forces which produce it and of forces in equilibrium. Rational mechanics comprises "cinematics" (see "Cinematics"), in which is studied motion independently of the forces which produce it, consequently from a geometric standpoint solely; "dynamics" (see "Dynamics"), in which is studied the relations of motion to the forces which produce it; and "statics" (see "Statics"), a

particular case of dynamics in which there is no motion, and in which is consequently studied the action of forces in equilibrium in a point or in a material system. Applied mechanics includes the applications of the preceding theories to practice; resistance of materials, graphic statics, hydraulics, prime movers, etc.

Meckel, F. L.—77 E. 13th St., Chicago, Ill. Mfrs. automobile tops.

Medart, Fred.—St. Louis, Mo. Mfr. motorboats.

Medina Stamping & Machine Co.—Church St., Medina, N. Y. (Winton, Cadillac, Oldsmobile, Autocar, Pope-Toledo.)

Meech, Chas. E.—Sec., Treas. and Director Wilmarth & Morman Co., 585 Canal St., Grand Rapids, Mich.

Meeker Foundry Co.—95 Clay St., Newark, N. J. Mfrs. gray iron castings, malleable iron castings.

Meeks, Dr. H. A.—88 E. Main St., Meriden, Conn. (Stevens-Duryea, Pope-Hartford.)

Meenan & Studt.—Avenida Juarez, Mexico City, Mexico. Garage.

Mega.—A prefix indicating that the term which it precedes is multiplied by a million.

Megargel, Ralph G.—913 Olive St., Scranton, Pa. (Elmore.)

Mégevet et Cie., C. J.—Geneva, Switzerland; Bellegarde, France, and Turin, Italy. Mfrs. oil and acetylene lamps, radiators.

Megohm.—A measure having a value of 1,000,000 ohms.

Meguire, Dr. T. D.—3907 Borden St., Cincinnati, O. (Cartercar.)

Mehlig, J.—113 St. Charles St., New Orleans, La. (Knox.)

Meinders, Ed. H.—211 W. High St., Piqua, O. Repairing.

Meiselbach Motor Wagon Co.—North Milwaukee, Wis. Mfrs. gasoline commercial automobiles.

Meisel Press & Mfg. Co.—944-948 Dorchester Ave., Boston, Mass. Mfrs. transmission gears, steering apparatus.

Melanowski, Leo.—Designer Aerocar Motor Co., Mack & Beaufait Aves., Detroit, Mich.

Melle, Max.—Mgr. Peerless Garage, 942-944 Bedford Ave., Brooklyn, N. Y.

Melville, A. B.—Vice-Pres. Lipman Mfg. Co., 300 Pleasant St., Beloit, Wis.

Member.—A single portion of a structure or machine. See Machine Element.

Memphis Auto Co.—Memphis, Tenn. (Thomas Flyer.)

Menasco, A. S.—Sec. and Treas. American Motor Car Co., Indianapolis, Ind.

Mendelssohn et Co., Ltd., E.—Courbevoie, Seine, France. Mfrs. gasoline automobiles. (Mendelssohn cars.)

Mendenhall, C. S.—Race St. and Opera Pl., Cincinnati, O. Pubs. road maps.

Menegaut-Basset, G.—35 Ave. Laplace Arcueil, Seine, France. Mfrs. non-skids, pneumatic tires.

Menges Motor Car Co.—Grand Rapids, Mich. Mfrs. gasoline automobiles.

Menominee River Auto Co.—418 Main St., Menominee, Mich. (Reo, Premier, Queen, Ford.)

Mentel's Auto Agency.—Springfield, O. (Jackson.)

Mercantile Motor Car Co.—368 Cumberland St., Brooklyn, N. Y. Repairing.

Mercantile Motor Co.—Jersey City, N. J. Mfrs. gasoline commercial automobiles.

Mercedes Import Co.—590 5th Ave., New York City. (Mercedes.) Selling branches in Boston, Mass.; 1449 Michigan Ave., Chicago, Ill.; 153 N. Broad St., Philadelphia, Pa.

Mercer County Automobile Club.—W. F. Sadler, Jr., Sec., Trenton, N. J.

Mercer, James R.—Sec., Treas. and Mgr. National Wheel Co., Jackson, Mich.

Mercer, W. E.—Ventura, Cal. (Maxwell.)

Merchant & Evans Co.—517 Arch St., Philadelphia, Pa. Importers and mfrs. Hele-Shaw clutches, change speed gears, metal tire cases, axles, special steel frames. Branches in New York, Chicago, Baltimore, Kansas City.

Merchant, B. D.—Alameda Garage, 2150 Central Ave., Alameda, Cal. (Pope-Hartford, Franklin, Royal, Hewitt.) Est. 1905. B. D. Merchant, Pres. Garage, 20 cars; repairing.

Mercury.—A remarkable metal, sometimes called "quicksilver," of a nearly silver-white color, and having a very high degree of luster. It is liquid at all ordinary temperatures, and solidifies only when cooled to -40° F. Its symbol is Hg, and its atomic weight 200. It is used in automobilism for amalgamating the zinc plates of ignition batteries. See Amalgamation.

Mercury Auto Co.—2119 N. Broad St., Philadelphia, Pa. Garage.

Meridian Auto & Cycle Co.—Meridian, Miss. Garage.

Meriden Auto Station.—41 W. Main St., Meriden, Conn. Garage.

Meredith, J. L.—Elburns, Ill. (Maxwell.)

Merkel, Jos. F.—Vice-Pres., Designer and Supt. Merkel Motor Co., 1090 26th Ave., Milwaukee, Wis.

Merkel Motor Co.—Milwaukee, Wis. Mfrs. Merkel motorcycles.

Merrifield, F. E.—Sales Mgr. and Advt. Mgr. Outing Boat Co., Kankakee, Ill.

Merrihew, S. Wallis.—Vice-Pres. Automobile Topics, Inc., 402 Times Bldg., New York City. Editor Automobile

Topics, International Motor Cyclopaedia, American Lawn Tennis.

Merril Spring Co., E. R.—530 W. 28th St., New York City. Mfrs. leaf springs.

Merritt & Co.—1022-30 Ridge Ave., Philadelphia, Pa. Mfrs. expanded metal lockers and universal steel shelving for garage furnishings.

Merritt & Simpson.—35 Arlington Ave., Newark, N. J. (Waltham.)

Merritt, H. R.—Treas. Oil City Oil & Grease Co., Oil City, Pa.

Mersereau, J. W.—Treas. The E. J. Kehoe Co., Inc., 1659 Broadway, New York City.

Mersereau, T. W.—Sec. The E. J. Kehoe Co., Inc., 1659 Broadway, New York City.

Mershon & Morley.—Saginaw, Mich. Mfrs. portable houses.

Mervelle, F., et G. Garnier.—57 bvd. Richard-Lenoir, Paris, France. Mfrs. tops.

Merwin, G. W.—Vice-Pres. Lustre Chemical Co., Sheridan, Ore.

Merwin, J. N.—Sales and Advt. Mgr. Forest City Motor Co., 101-149 Walnut St., Massillon, O.

Merz Frères.—139 Faubourg St. Denis, Paris, France. Mfrs. goggles.

Merz, Gebrüder.—25 Weingarten, Frankfort-Bockenheim, Germany. Mfrs. goggles.

Mesh.—To engage, as the teeth of gears or racks. "Always in mesh" is said of pinions always in gear as distinguished from the sliding-gear, the pinions of which come into engagement only at the moment of change of speed.

Mesinger, Frederick.—Partner H. & F. Mesinger Mfg. Co., 1801-07 1st Ave., New York City.

Mesinger Mfg. Co., H. & F.—1801-1807 1st Ave., New York City. Mfrs. leather pneumatic non-skid tires. Est. 1897. Partnership Henry Mesinger and Frederick Mesinger.

Mesinger, Henry.—Partner H. & F. Mesinger Mfg. Co., 1801-07 1st Ave., New York City.

Messner, Paul.—Head Repair Dept., Harrisburg Auto Co., 3d and Hamilton Sts., Harrisburg, Pa.

Mesta Machine Co.—Pittsburg, Pa. Mfrs. malleable iron castings, steel castings.

Mestre et Blatgé.—5 rue Brunel, Paris, France. Mfrs. horns.

Metal.—A term for a large proportion of the known elementary substances. (2) Crushed stone suitable for road making.

Metal, Babbitt's.—See Babbitt's Metal.

Metal, Gun.—A species of brass employed in casting cannon, and used also in the wearing parts or joints of machinery. This alloy should consist of 9 parts copper and 1 of tin, but no zinc. It is used for crank-shaft and other bearings

in motor construction. It also answers well for valves.

Metallic Packing.—See Packing, Metallic.

Metallindustrie Schönbeck, Actiengesellschaft.—Schönbeck, Germany. Mfrs. motorcycles.

Metallwerkgesellschaft Ohligs.—Ohligs, Germany. Mfrs. metallic rims.

Métallurgique, Société Anonyme La.—1 Place de Louvain, Brussels, Belgium. Mfrs. gasoline automobiles. (Métallurgique cars.)

Metal Specialties Mfg. Co.—14-24 W. Randolph St., Chicago, Ill. Mfrs. pressed steel and screw machine products, spark plugs, stampings.

Metal Stamping Co.—243 West St., New York City. Mfrs. bow sockets, curtain fasteners, radiators, top fixtures, cloth and carpet trimmings, metal trimmings, seats.

Meteor Automobile Works, The.—Beltenndorf, Ia. Mfrs. gasoline automobiles.

Methven, D. C.—Salina, Kan. (Cameron.)

Methyl.—See Alcohol, Wood.

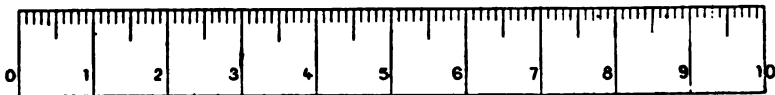
Metre.—A measure of length, the base of all measures in the "metric system," adopted by France and all the principal nations of the world, except Great Britain, the United States and Russia, and used as a standard therein. The unit of length is the centimetre, which is the hundredth part of the length, at 0° C. of a bar of iridio-platinum, called the "International Metre" (deposited at the Pavillon de Breteuil, Sevres). The length of a metre, which was formerly defined as the "ten-millionth part of a quarter

inch. The values of these differ not only between nationalities, but between parts of the same nations. The value of the metre in the more prominent of the countries of the civilized world is as follows:

Where the foot and inch are still in use.	Value of one metre in feet.	Inches to the foot.	Centimetres to the foot.
Austria	3.163	12	31.61
Baden	3.333	10	30.00
Bavaria	3.426	12	29.19
Denmark	3.186	12	31.39
Great Britain ..	3.280	12	30.48
Hanover	3.426	12	29.19
North America.	3.280	12	30.48
Norway	3.186	12	31.39
Prussia	3.186	12	31.39
Russia	3.280	12	30.48
Saxony	3.531	12	28.32
Sweden	3.368	10	29.69
Switzerland	3.333	10	30.00
Wurtemberg ..	3.490	10	28.65

Metric Conversion Table.—The following table will be found convenient in dealing with metric weights and measures.

Millimeters $\times .03937$ = inches.
 Millimeters $\div 25.4$ = inches.
 Centimeters $\times .3937$ = inches.
 Centimeters $\div 2.54$ = inches.
 Meters $\times 39.37$ = inches. (Act of Congress.)
 Meters $\times 3.281$ = feet
 Meters $\times 1.094$ = yards.
 Kilometers $\times .621$ = miles.
 Kilometers $\div 1.6093$ = miles.
 Kilometers $\times 3280.7$ = feet.
 Square millimeters $\times .0155$ = square inches.



of the terrestrial meridian," is equal, with respect to the old French measure of length, to .513074 of a "toise." The metre is equal to 1.093 yard, or 3.28 English feet. The decimetre, 1-10 of a metre, is equal to 3.9337 inches (see figure which gives its actual length). The centimetre is equal to .39375 of an English inch. The square metre, the unit of surface, is a square each of the sides of which is one metre in length. It equals 100 square decimetres, or 10.76 square feet. The cubic metre, the unit of volume, is a cube of which each face has a surface of one square metre; it is therefore equal to 10,000 cubic decimetres, or 353 cubic feet. The various states of Germany, as well as the other countries of Europe, although having adopted the decimal system of measurement of length, still retain to a large extent their old units of measurement, the foot and

Square millimeters $\div 645.1$ = square inches.
 Square centimeters $\times .155$ = square inches.
 Square centimeters $\div 6.451$ = square inches.
 Square meters $\times 10.764$ = square feet.
 Square kilometers $\times 247.1$ = acres.
 Hectares $\times 2.471$ = acres.
 Cubic centimeters $\div 16.383$ = cubic inches.
 Cubic centimeters $\div 3.69$ = fluid drachms. (U. S. P.)
 Cubic centimeters $\div 29.57$ = fluid ounce. (U. S. P.)
 Cubic meters $\times 35.315$ = cubic feet.
 Cubic meters $\times 1.308$ = cubic yards.
 Cubic meters $\times 264.2$ = gallons (231 cu. in.).
 Liters $\times 61.022$ = cubic inches. (Act Congress.)

Liters $\times 33.84$ = fluid ounces. (U. S. Phar.)

Liters $\times .2642$ = gallons (231 cubic inches).

Liters $\div 3.78$ = gallons (231 cubic inches).

Liters $\div 28.316$ = cubic feet.

Hectoliters $\times 3.531$ = cubic feet.

Hectoliters $\times 2.84$ = bushels (2150.42 cubic inches.)

Hectoliters $\times .131$ = cubic yards.

Hectoliters $\div 26.42$ = gallons (231 cubic inches).

Grammes $\times 15.432$ = grains. (Act Congress.)

Grammes $\times 981$ = dynes.

Grammes (water) $\div 29.57$ = fluid ounces.

Grammes $\div 28.35$ = ounces avoirdupois.

Grammes per cu. cent. $\div 27.7$ = lbs. per cu. in.

Joule $\times .7373$ = foot pounds.

Kilograms $\times 2.2046$ = pounds

Kilograms $\times 35.3$ = ounces avoirdupois.

Kilograms $\div 1102.3$ = tons (2,000 lbs.).

Kilograms per sq. cent. $\times 14.223$ = lbs. per sq. in.

Kilogrammeters $\times 7.233$ = foot pounds.

Kilograms per meter $\times .672$ = pounds per square foot.

Kilograms per cubic meter $\times .062$ = pounds per cu. ft.

Kilogram per cheval vapeur $\times 2.235$ = lbs. per HP.

Kilo-watts $\times 1.34$ = horse power.

Watts $\div 746$ = horse power.

Watts $\div .7373$ = foot pounds per second.

Calorie $\times 3.968$ = B. T. U.

Cheval vapeur $\times .9863$ = horse power.

(Centigrade $\times 1.8$) $\div 32$ = degrees Fahrenheit.

Francs $\times .193$ = dollars.

Gravity, Paris = 980.94 centimeters per second.

Metric Horse-power.—See Horse-power, Metric.

Metric System.—See Metre.

Metropolitan Automobile Co.—57-61 Stanhope St., Boston, Mass. Est. 1906. Cap. \$25,000. Alvah M. Thompson, Pres.; V. A. Nielsen, Vice-Pres., Gen. Mgr. and Sales Mgr.; W. S. Thompson, Sec.; V. Lindberg, Supt. Repair Dept. Garage, 75 cars; repairing.

Metropolitan Motor Car Co.—E. 19th and Euclid Ave., Cleveland, O. (Pierce Arrow, Stearns, Cadillac.)

Mets Paint Co., The P. A.—769 Clinton St., Buffalo, N. Y. Mfrs. paints.

Metteure-Debrie, J.—13 rue de France, Brussels, Belgium. Mfrs. bodies.

Mettowee Valley Auto Agency.—Granville, N. Y. (Cadillac.)

Metz, C. H.—Waltham, Mass. Mfr. motorcycles.

Metzeler et Cie.—1 rue Villaret-de-

Joyeuse, Paris, France. Mfrs. pneumatic tires.

Metzger, Wm. E.—252 Woodward Ave., Detroit, Mich. (Indian.)

Metzger, William Ernest.—Sales Mgr. Cadillac Motor Car Co. B. Peru, Ill., Sept. 30, 1868. Ed. Detroit High School, graduate 1885. Director Cadillac Motor Car Co. Mem. A. A. A., A. C. of Detroit, Aero C. A., Detroit Yacht, Fellowcraft, Detroit Golf, Cleveland A. C., Buffalo A. C. Res. 28 Longfellow Ave.,

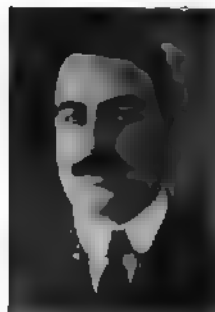


Photo by Spomer & Wells.

Detroit, Mich. Office, Cadillac Motor Car Co. In trade since 1895. Used first car 1895.

Meunier, Bombal et Delung.—14 rue Mareschal, Chaumont, Haute Marne, France. Mfrs. primary batteries.

Mexican Mfg. Co.—239 S. Main St., Wichita, Kan. Mfrs. metal polishes.

Mey Chain Belting Works.—77 Washington St., Buffalo, N. Y. Mfrs. belting.

Meyer & Co., John C.—Boyleston and Bismarck Sts., Jamaica Plain, Mass. Mfrs. taper pins.

Meyer, Eugene.—347 Amsterdam Ave., New York City. Garage.

Meyer, Frank.—Sec. and Treas. Lakdel Auto Co., 5143 Delmar Blvd., St. Louis, Mo.

Meyer, Morris F.—65-67-69 E. Woodbridge St., Detroit, Mich. Mfrs. steering wheels, glass wind shields.

Meyer, R.—151 Main St., Springfield, Mass. (Lambert.)

Meyer, V. F.—520 Washington St., Hoboken, N. J. Garage.

Meyercord Co.—Chamber of Commerce, Chicago, Ill. Mfrs. name plates.

Meyers & Grayson.—1608 Broadway, New York City. Vulcanizing.

Meyers, Chas. S.—318 Cherry St., Columbia, Pa. (Rambler.)

Meyers, J. P.—500 St. George St., York, Pa. (Rambler.)

Meyers, W. F.—Head Sundries and Supply Dept. Cincinnati Auto Co., 215-219 E. 5th St., Cincinnati, O.

Meyrowitz, Du P.—Sec. Meyrowitz Mfg. Co., Inc., 104 E. 23d St., New York City.

Meyrowitz, E. B.—Pres. and Treas. Meyrowitz Mfg. Co., Inc., 104 E. 23d St., New York City.

Meyrowitz Mfg. Co., Inc.—104 E. 23d St., New York City. Mfrs. automobile goggles. E. B. Meyrowitz, Pres. and

Treas.; E. Du P. Meyrowitz, Sec.; C. F. Dieckman, Supt.

Mezger, C. A., Inc.—203 W. 80th St., New York City. Mfrs. spark plugs.

M'Farland Foundry & Machine Works.—Trenton, N. J. Mfrs. marine gears.

Mho.—See Conductance.

Miami Automobile Co.—13th St., bet. Aves. D and E, Miami, Fla. (Locomotive, Reo.) Garage and repairing.

Miami Cycle & Mfg. Co.—Grand Ave., Middletown, O. Mfrs. motorcycles

Miami Motor Car Co.—117 E. 2d St., Dayton, O. (Franklin, Haynes, Waltham.) Garage; repairing.

Miami Transfer Co.—11th St., bet. Aves. D and E, Miami, Fla. Garage.

Mianus Garage.—Mianus, Conn. Repairing.

Mianus Motor Works.—Cos Cob, Conn. Mfrs. marine motors. Est. 1897. Cap. \$100,000. George Gray, Pres.; F. A. Hubbard, Vice-Pres.; Chas. B. Allyn, Treas.; A. P. Avey, Sec. Branches Baltimore, Md., 1600 Borroughs St.; Boston, Mass., 8 Commercial Wharf; Newark, N. J., 128 Front St.; New York City, 30 South St.; Portland, Me., 29 Portland Pier.

Mica.—A name applied to a group of hydrous silicates crystallizing in the monosymmetric system and exhibiting pseudo-hexagonal forms. All have a perfect basal cleavage, the lamellae being elastic. Mica is one of the best insulating materials known, and is used for making condensers, collectors, or invertors, for dynamos, etc., and spark-plugs.

Mica Insulator Co.—New York City and Chicago, Ill. Mfrs. mica.

Mica Mfg. Co.—307 W. Broadway, New York City. Mfrs. cut and uncut mica, washers, tubes, cores, spark-plug insulation. Cap. \$100,000. Est. 1882. John A. O. Neid, Pres.; I. O. Neid, Vice-Pres.; C. J. Busick, Sec.

Micanite.—A product obtained by the mixing and fusing together of powdered mica and gumlac. It is an excellent insulator, and is used in the construction of induction-coils.

Michaelis-Middlekauff Auto Co.—1650-54 Glenarm St., Denver, Colo. (Queen.) Est. May, 1907. John Walker, Foreman of Repair Dept. Garage, 40 cars; repairing.

Michael, J.—Pres. Geo. J. Scott Motor Co., 1720-22 Broadway, New York City.

Michel, Chas. E.—Head Automobile Dept., Union Light & Power Co., 3920 Morgan St., St. Louis, Mo.

Michel et fils.—25 rue de France, Brussels, Belgium. Mfrs. bodies.

Michelin, André-Jules.—105 Boulevard

Pérecire, Paris. B. Paris, Jan. 17, 1853.



Chevalier of the Legion of Honor, officer of the Academy, officer of the Order of Cambodge, Engineer E. C. P., Commercial Mgr. of the Société Michelin et Cie., Paris representative of the Clermont factory and and Mgr. of the house of A. Mich-

elin, 15 Rue de Bagnolet. Pupil of the Central School of Paris and of the School of Fine Arts (Section of Architecture), etc.

Michelin et Cie.—15 rue du Nord, Clermont-Ferrand, France. Mfrs. solid tires.

Michelin et Cie.—105 bvd. Pereire, Paris, France. Mfrs. pneumatic rubber tires, tire pumps, jacks.

Michelin, Edouard-Etienne.—Clermont-Ferrand, Puy-de-Dôme, B. Clermont-Ferrand, June 23, 1859. Manager of the Société Michelin et Cie. Pupil of the School of Fine Arts (Section of Painting), and licentiate in law. He is occupied at present with the technical and industrial department of the Société Michelin.

Michelin Tire Co.—Milltown, N. J. Mfrs. automobile tires and accessories. Cap. \$3,000,000. Est. 1907 in America, 1832 in France. Edouard Michelin, Pres.; Emil Fontaine, Treas.; F. W. Libby, Sales Mgr. Branches: Boston, New York, Philadelphia, Buffalo, Cleveland, Detroit, Chicago, Minneapolis, Denver, Los Angeles, San Francisco, St. Louis.

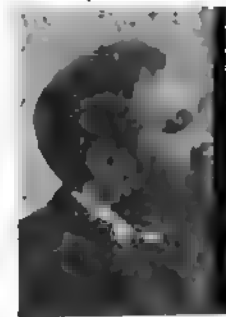
Michelin Tire Agency.—230 Broadway, Buffalo, N. Y. Supplies.

Michigan Automobile & Supply Co.—Menominee, Mich. (Holsman.)

Michigan Automobile Co., Ltd.—Kalamazoo, Mich. Mfrs. machine work to order, gasoline automobile motors, gear blanks, gasoline automobiles.

Michigan Auto Exchange.—Michigan Ave., Detroit, Mich. Garage.

Michigan Bolt & Nut Works.—Foot Meldrum Ave., Detroit, Mich. Mfrs. drop forgings. Cap. \$300,000. Est. 1863. E. Y. Swift, Pres.; E. T. Gilbert, Treas. and Mgr.; H. MacLean, Sec.; August Lindow, Supt.



Michigan Crucible Steel Castings Co.—Guion St., Detroit, Mich. Mfrs. steel castings.

Michigan Lubricator Co.—661-671 Beaubien St., Detroit, Mich. Mfrs. lubricators, oil pumps.

Michigan State Automobile Assn.—Grand Rapids, Mich. Edwin S. George, Detroit, Mich., Pres.; D. M. Ferry, Jr., Detroit, Mich., Vice-Pres.; James R. Jackson, Grand Rapids, Mich., Treas.; Dr. D. Emmet Welch, Grand Rapids, Mich., Sec.; Membership: Automobile Club of Detroit, Grand Rapids Automobile Club.

Michigan Steel Boat Co.—1252 Jefferson Ave., Detroit, Mich. Mfrs. motor-boats.

Michigan Storage Battery Co.—24 Atwater St., E. Detroit, Mich. Mfrs. storage batteries.

Michigan Top Co.—17 Duffield St., Detroit, Mich. Mfrs. automobile tops, wind shields, bow separators. Not inc. Est. 1906. E. H. Coombs, Mgr.

Mick's Automobile Garage.—58 N. 2d St., Camden, N. J. Garage.

Micro.—A prefix indicating that the term it precedes is divided by a million; e.g., a "microhm" is a millionth part of an ohm.

Microfarad.—One millionth part of a farad, q. v.

Microhm.—See Micro.

Micrometer-caliper.—See Caliper, Micrometer.

Micrometer-gauge.—See Gauge, Micrometer.

Micron.—A measure of length equivalent to a thousandth of a millimetre.

Middleboro Auto Exchange.—Middleboro, Mass. (Autocar.)

Middle Gear.—See Link-motion.

Middlemore & Lamplugh, Ltd.—Holloway Hd., Birmingham, England. Mfrs. non-skids.

Middlesex Motor Car Co.—George St. and Carroll Pl., New Brunswick, N. J. (Indian, Pope Hartford.)

Middleton, Arthur H.—2821 N Broad St., Philadelphia, Pa. Selling Agents Hubbard patent tires.

Middleton, A. C.—447 Carteret St., Camden, N. J. (Rambler.)

Middleton Motor Car Co.—1032 S. Main St., Los Angeles, Cal. (Columbia.)

Middleton Motor Car Co.—550 Golden-gate Ave., San Francisco, Cal. (Corbin, Columbia, Autocar.)

Middletown Auto Body Co.—Middletown, Conn. Mfrs. wood and metallic bodies.

Middletown Auto Co.—10 Henry St., Middletown, N. Y. (Maxwell.)

Midgley Mfg. Co.—Columbus, O. Mfrs. steel rims, tubular steel wheels.

Midland Motor Car Co.—1116 E. 15th St., Kansas City, Mo. (Peerless.)

Midland Rubber Co., Ltd.—Ryland St.,

Birmingham, England. Mfrs. pneumatic tires.

Midvale Steel Co.—Philadelphia, Pa. Mfrs. steel, chrome-nickle steel.

Mietz, A.—138 Mott St., New York City. Mfrs. air compressors, kerosene motors, circulating pumps.

Mieusset fils, V.—17 rue du Gazometre, Lyons, France. Mfrs. gasoline automobiles. (Mieusset cars.)

Migliavacca Co.—208 2nd Ave., Seattle, Wash. (Earl, Glide.)

Miksch, M. J.—Vice-Pres. Temple Pump Co., 15th St. and 15th Pl., near Canal St., Chicago, Ill.

Mil.—The one-thousandth part of an inch, used to denote the diameter of wires, the thickness of transformer plates, etc., instead of the numbers in the wire gauge.

Mild Steel.—See Steel, Mild.

Mile, Nautical.—A measure of length, called also a "knot," and equal to 6080 feet. See Knot.

Miles, E. J.—Newton, Ia. (Holsman.)

Miles, Samuel Arthur.—Gen. Mgr. National Association of Automobile Manufacturers. B. Bristol, England, May 10, 1862. Ed. Bristol Cathedral. Mem. Clubs: Chicago A. C., N. Y. Athletic, N. Y. Motor. Office. 7 E. 42nd St., New York City. Used



first car March, 1900.

Milford Auto Coat Co.—Milford, Mass. Mfrs. miscellaneous wearing apparel.

Milford Automobile Machine Co.—17 Main St., Milford, Mass. (Maxwell.)

Milled Nut.—See Nut, Milled.

Miller & Armstrong.—N. First St., Fulton, N. Y. Garage.

Miller & Bros., Chas. E.—1105 14th St., N. W., Washington, D. C. (Ford, Columbus, Electric, Reo, Premier.)

Miller & Co., A. J.—Bellefontaine, O. Mfrs. automobile bodies and seats. A. J. Miller, Sole owner.

Miller & Van Winkle.—18 Bridge St., Brooklyn, N. Y. Mfrs. machinery springs.

Miller, A. C.—Supt. Royal Motor Car Co., Gordon Park Blvd. and Lake Shore Tracks, Cleveland, O.

Miller, A. J.—Sole Owner A. J. Miller & Co., Bellefontaine, O.

Miller, Alex.—Bookkeeper and Cashier Gen. Mfg. Co., Elkhart, Ind.

Miller Auto Co.—132 N. Cascade Ave., Colorado Springs, Colo. (Waltham.) Garage.

Miller Bros.—Amesbury, Mass. Mfrs. wood and metallic bodies.

Miller Bros. Automobile Co.—1404 Meridian St., Anderson, Ind. Garage.

Miller, B.—4036 Prairie Ave., Chicago, Ill. Garage.

Miller Bros.—7 Bay and 12 Maple Sts., Glens Falls, N. Y. (Buick.) Est. 1901. Garage, 75 cars. Repairing.

Miller, C. A.—Pres. Continental Automobile Co., St. John and Olive Sts., New Haven, Conn.

Miller Cahoon Co.—Murray, Utah. (Pope-Hartford, Knox.)

Miller, C. D., Dr.—Poughkeepsie, N. Y. (White.)

Miller, Chas. C.—Vice-Pres. and Hd. of Foundry, Pioneer Brass Works. 418-24 S. Pennsylvania St., Indianapolis, Ind.

Miller, Chas. E.—1235 S. Meridian St., Anderson, Ind. Vulcanizing.

Miller, Chas. E.—97-101 Reade St. and 924 Eighth Ave., New York City; 406 Erie St., Cleveland, O.; 318-20 N. Broad St., Philadelphia, Pa.; 227½ and 229 Jefferson Ave., Detroit, Mich.; 202-04 Columbus Ave., Boston, Mass.; 824 Main St., Buffalo, N. Y. Mfr., jobber, exporter and importer automobile supplies.

Miller, Charles Joseph Sibley.—Manufacturer and capitalist. B. Franklin, Pa., May 11, 1874. Director in numerous companies. Mem. N. Y. Athletic, N. Y. Yacht, N. Y. Press, A. A. A., A. C. A., National Geographic Society. Office and res., New York City and Franklin, Pa. Owned 28 automobiles, foreign and American, in



past two and one half years. Made a balloon ascension June 25, 1906

Miller, C. P.—Sec. Temple Pump Co., 15th St. and 15th Pl., nr. Canal St., Chicago, Ill.

Miller, E. C.—Vice-Pres. Magnolia Metal Co., 113-15 Bank St., New York City.

Miller, E. H.—Canal Dover. O. (Jewel.)

Miller, E. H.—8th St., Elkhart, Ind., and Fort Wayne, Ind. (Pope-Hartford.)

Miller, F. E.—440 Main St., Princeton, Ill. Garage.

Miller, F. J.—Lake Ave. and 3rd St., Racine, Wis. (Winton, Cadillac.)

Miller, F. P.—Pres. Utica Motor Car Co., 333 Bleeker St., Utica, N. Y.

Miller's Garage Co.—554-58 Fairfield Ave., Bridgeport, Conn. (Glide, Maxwell.) Supplies, repairing.

Miller, Geo. H.—275 S. Garey Ave., Pomona, Cal. (Ford, Tourist, Pope-Waverley.)

Miller, Geo. J.—Electro-Chemist Toledo Storage Battery Co., 102 Oliver St., Toledo, O.

Miller, H.—Pres. and Gen. Mgr. The J. Kowalsky Engine Co., Grant St. and Railroad Ave., Verona, Pa.

Miller, H. O.—101 Prospect St., Brockton, Mass. Garage.

Miller, H. R.—Vice-Pres. Excelsior Carriage Co., Main St., White River Junction, Vt.

Miller, H. W.—Sec. and Treas. Ideal Mfg. Co., Portsmouth, O.

Miller, James Acton, M. E.—Director Mechanical Engineer and Hd. Mfg. and Designing Dept. Standard Metal Work Co., Thompsonville, Conn.

Miller, John A.—Pres. T. C. and W. L. Fry Co., 201 Brighton Ave., Rochester, Pa.

Miller, L. C.—227 Broad St., Waverley, N. Y. Garage.

Miller Mfg. Co., The.—813 Central Ave., Peekskill, N. Y. Mfrs. searchlights, generators, pumps, oil guns and automobile jacks

Miller Motor Car Co.—Bridgeport, Conn. Mfrs. gasoline commercial automobiles.

Miller, R., Jr.—Vice-Pres. and Treas. The J. Kowalsky Engine Co., Grant St. and Railroad Ave., Verona, Pa.

Miller, Sol.—Newport News, Va. (Jackson.)

Miller Sons Carriage Co., Geo. C.—713 Main St., Cincinnati, O. (Stevens-Duryear, Isatta.)

Miller's Sons, Wm. P.—73-79 3rd St., Long Island City, N. Y. Mfrs. grease, oils, semi-solid oils. Garage.

Miller, S. W.—Martinsburg, Md. Garage

Miller, T. W.—Mgr. Seattle Branch Winton Motor Carriage Co., Seattle, Wash.

Miller, W. E.—1st Vice-Pres. and Gen. Mgr. Fairbanks Morse & Co., Franklin & Monroe Sts., Chicago, Ill.

Miller, Wm.—Thomasville, Ga. (Holzman.)

Miller, Wm. B.—Sec. The Diamond Rubber Co., Akron, O.

Miller, W. H.—Walnut St., Champaign, Ill. Repairing.

Miller, William H.—Cor. 7th and Wisconsin Sts., Racine, Wis. Garage.

Miller, Wm. H.—Vice-Pres. Knobblock-Heideman Mfg. Co., South Bend, Ind.

Miller, W. J.—Vice-Pres., Supt. Oscar Lear Auto Co., Springfield, O.

Miller, W. S.—Purch. Agt. Rainier Co., Saginaw, Mich.

Milli.—A prefix to the name of a unit, denoting that the unit is divided by one thousand

Milling.—See Knurling and Reeding.

Milling-machine.—A machine for rapidly shaping pieces of metal by the use of rotating cutters.

Million, René.—53 rue de Villiers, Neuilly sur-Seine, France. Mfrs. shock absorbers.

Mills & Peterson.—Akron, N. Y. (Lambert.)

Mills Auto & Bicycle Co.—Newark, O. (Cadillac.)

Mills, Chas.—21 E. Church St., Newark, O. (Jewel.)

Mills-Kennedy Co.—733 Boylston St., Boston, Mass. (Springfield, Welch.)

Mills Mfg. Co.—1368-70 Broadway, New York City. Mfrs. eye shields.

Mills, W. J.—Asst. Sales Mgr. Stackpole Battery Co., St. Mary's, Pa.

Millsbaugh, W. H.—Pres. Sandusky Foundry & Machine Co., Sandusky, O.

Millward & Cook.—208 W. 124th St., New York City. Garage.

Millwood Mfg. Co.—55th St. and S. Park Ave., Chicago, Ill. Mfrs. wind shields.

Milne, A.—Vice-Pres. Milne Auto-Start Co., 919 W. Fort St., Detroit, Mich.

Milne Auto-Start Co.—919 W. Fort St., Detroit, Mich. Mfrs. safety starting devices. Cap. \$30,000. Est. 1907. D. D. Flanner, Toledo, O., Pres.; Thos. A. Milne, Vice-Pres.; H. W. Reeves, Treas.; A. L. McBean, Sec.

Milnes-Daimler Co., Ltd.—221 Tottenham Court, London, W., England. Mfrs. gasoline commercial automobiles.

Milne, Frank.—Everett, Mass. Mfr. body irons, steering apparatus.

Milne, Frank.—43 Columbus Ave., Boston, Mass. Garage.

Milne, W. S.—Cleveland, Tenn. (Pope-Waverley.)

Milton Co., Frank.—30 W. State St., Trenton, N. J. Garage.

Milton Point Shipyard.—Rye, N. Y. Mfrs. motorboats.

Milton, T. M.—Brewertown, N. Y. Mfr. motorboats.

Milward, F. S.—Purch. Agt. Welch Motor Car Co., Pontiac, Mich.

Milwaukee Auto Engine Supply Co.—706-8 Winnebago St., Milwaukee, Wis. Mfrs. transmission gears, gasoline automobile motors, timers.

Milwaukee Automobile Club.—Milwaukee, Wis. Organized 1902, to promote "Fraternity among automobilists." Louis Fuldner, Pres.; W. H. Popkorn, Vice-Pres.; James T. Drought, Sec.; C. S. Drake, Treas.

Milwaukee Automobile Trade Ass'n.—Milwaukee, Wis. Alfred Reeke, Sec. cr. Sollday Motor Car Co.

Milwaukee Brass Mfg. Co.—Milwaukee, Wis. Mfrs. brass pipe fittings.

Milwaukee Electric Co.—Milwaukee, Wis. Mfrs. electric generators, electric motors.

Milwaukee Motor Co.—615 Clyborn Ave., Milwaukee, Wis. Mfrs. transmission gears, gasoline automobile motors, gasoline marine motors, mufflers, circulating pumps.

Milwaukee Steel Foundry Co.—Milwaukee, Wis. Mfrs. steel castings.

Minchin, C. H.—157 Greenwich Ave., Greenwich, Conn., and Port Chester, N. Y. (Waltham.)

Mindener Maschinen und Fahrradwerke.—Minden, Westphalia, Germany. Mfrs. Minden motorcycles.

Mineola Motor Car Co.—Mineola, L. I., N. Y. Garage.

Mineral Oil.—See Oil, Mineral.

Mineral Pitch.—See Asphaltum.

Mineral Wax.—The same as ozokerite, q. v.

Miner & Peck Mfg. Co.—New Haven, Conn. Mfrs. forge equipment.

Miner Co., Geo. L. S.—Clinton Ave., Cor. Court St., Rochester, N. Y. (Indian.)

Miner, F. G.—San Francisco, Cal. (Fiat.)

Miner, F. J.—Mgr., Sec. and Treas. Seidler-Miner Electric Co., 207 Jefferson Ave., Detroit, Mich.

Miner Garage Co.—Cor. High & Allyn St., Hartford, Conn. (Buick, Pierce Arrow, Knox, Pope-Waverley, Haynes.)

Minerva Motors, Ltd.—Berchem-Anvers, Belgium. Mfrs. motorcycles, gasoline automobiles. (Minerva.)

Minett Varnish Co.—129 Pearl St., New York City. Mfrs. varnishes.

Minimax Co.—1161-75 Broadway, New York City. Mfrs. fire extinguishers.

Minium.—The same as red lead. See Lead, Red.

Minneapolis Automobile Club.—R. J. Smith, Sec., 1219 Guaranty Bldg., Minneapolis, Minn.

Minneapolis Automobile Co.—830 Hennepin Ave., Minneapolis, Minn. (Auburn, Austin.)

Minnesota Boat & Power Works.—Stillwater, Minn. Mfrs. motorboats.

Minnesota Malleable Iron Co.—St. Paul, Minn. Mfrs. malleable iron castings.

Minnesota State Automobile Association.—Minneapolis, Minn. Frank M. Joyce, Andrus Bldg., Minneapolis, Minn., Pres.; George M. Palmer, Mankato, Minn., Vice-Pres.; Dr. W. H. Card, Pillsbury Bldg., Minneapolis, Minn., Sec. and Treas. Membership: Automobile Club of St. Paul, A. C. of Winona, A. C. of St. Cloud, A. C. of Red Wing, A. C. of Owatonna, Duluth A. C., Mankato Automobile Club, Minneapolis A. C.

Monogue Body & Seat Co.—Kansas City, Mo. Mfrs. wood and metallic bodies.

Minot Machine Supply Co.—Minot, N. Dak. Garage.

Mintie & Benedict.—21 Buckingham St., Waterbury, Conn. (Pope-Waverley, Stevens-Duryea.)

Minutoli, Millo e Cio.—15 via Giglio, Lucca, Italy. Mfrs. motorcycles (M. M.)

Mironda Motor Car Co.—1012 N. Grand Ave., St. Louis, Mo. (Lozier, Knox.)

Mirror-finish.—A term applied to the extremely smooth internal surface of a motor-cylinder and external surface of a piston obtained by lapping or polishing.

Misfiring.—A term applied to the failure of the gaseous charge in a gasoline motor to ignite.

Missing - the - Gears.—An expression used to denote a failure to mesh sliding gears upon moving the change-speed lever.

Mission Garage.—757 W. 7th St., Riverside, Cal. Garage.

Mississippi Valley Auto Co.—5023 Delmar Blvd., St. Louis, Mo. (Couplegear, Peerless, Elmore, Pope-Toledo, Pope-Waverley, Elmore, Mercedes, Woods.) Electric charging, repairing.

Missouri State Automobile Ass'n.—St. Louis, Mo. Harry M. Rubey, Macon, Mo., Pres.; E. M. Senseney, St. Louis, Mo., 1st Vice-Pres.; W. W. Cowen, Kansas City, Mo., 2nd Vice-Pres.; Henry Krug, St. Joseph, Mo., 3rd Vice-Pres.; Edouard S. Austin, Jefferson City, Mo., Sec.; Roy F. Britton, 820 Equitable Bldg., St. Louis, Mo., Treas. Membership: A. C. of Kansas City, A. C. of Macon, A. C. of St. Joseph, A. C. of St. Louis, Sedalia A. C.

Missouri Valley Auto Co.—1112-1114 E. 15th St., Kansas City, Mo. (White.) Est. June, 1905. Cap. \$2,000. W. B. Doddridge, Pres.; W. Denton, Vice-Pres.; P. B. Doddridge, Sec., Treas. and Gen. Mgr. Garage, 150 cars; repairing.

Mitchell, A. D.—Helena, Mont. (Mitchell.)

Mitchell Agency of Bridgeport, The.—111 Meigs Bldg., Bridgeport, Conn. (Mitchell.)

Mitchell Auto Co.—466 Michigan Ave., Chicago, Ill. (Mitchell.)

Mitchell Auto Co., F. F.—St. Joseph, Mo. (Glide.) Cap. \$5,000. Incorporators, F. F. Mitchell, Elliot Spalding, William McCraill.

Mitchell, A. Z.—Auditor E. R. Thomas Motor Co., 1200 Niagara St., Buffalo, N. Y.

Mitchell Garage, The.—1028 Connecticut Ave., Washington, D. C. (Mitchell.)

Mitchell, Lewis & Staver Co.—Portland, Ore. (Mitchell.)

Mitchell Motor Car Co.—Racine, Wis. Makers of the Mitchell car; first market-

ed May, 1904. Twelve pleasure cars and two commercial cars made since. Cap. \$500,000. W. T. Lewis, Pres.; Wm. Mitchell Lewis, Treas. and Gen. Mgr.; H. E. Redman, Vice-Pres.; J. W. Bate, Supt., Designer and Engineer; G. V. Rogers, Sec.; J. W. Gilson, Asst. Treas. and Sales Mgr. Agents and dealers: American Auto Machine Co., 1927 1st Ave., S. Seattle, Wash. Aurora Automobile Co., Aurora, Neb. Baldner Motor Vehicle Co., Xenia, O. Barden Electric & Machinery Co., 109 Main St., Houston, Tex. Beattes, O. H., Dallas, Tex. Boda & Co., Robt. F., 20 E. Rich St., Columbus, O. Browne-Friend Motor Co., 228 Wisconsin St., Milwaukee, Wis. Bucyrus Cycle & Automobile Co., Bucyrus, O. Capital City Auto, Hack & Livery Co., 176 Allyn St., Hartford, Conn. Central Carriage Co., 134 Ontario St., Toledo, O. Core, G. W., Columbus Grove, O. Cramer, J. A., 737 Main St., Buffalo, N. Y. Cumbe, E. R., 1541 Cleveland Pl., Denver, Col. Dowagiac Mfg. Co., Dowagiac, Mich. Electrical Construction Co., Racine, Wis. Evans Motor Car Co., 522 S. 10th St., Minneapolis, Minn. Fenner, F. H., Ray City, Mich. Fischer Automobile Co., 330 N. Illinois St., Indianapolis, Ind. Gaithe, Wm., 28 N. Fountain Ave., Springfield, O. Gerrish, W. A., Enderlin, N. Dak. Greer-Robbins Co., 1501 S. Main St., Los Angeles, Cal. Harmon, A. E., 10th and Granby Sts., Norfolk, Va. Harris Steam Engine Co., Wm. A., Providence, R. I. Huntsman Auto Co., Tucson, Ariz. Jenkins & Co., W. M., 286 Columbus Ave., Boston, Mass. Jordan R. C., Columbus, Ga. Jungclas Automobile Co., 3454-3456 Reading Road, Avondale, Cincinnati, O. Kaw Valley Automobile Co., 3130 Main St., Kansas City, Mo. Keith, Simmons & Co., 316 Union St., Nashville, Tenn. La Crosse Motor Car Co., La Crosse, Wis. Liberty Automobile Co., 138 Beatty St., E. E., Pittsburgh, Pa. Lucas & Christenson, 2002 Euclid Ave., Cleveland, O. Maxwell-Briscoe-McLeod Co., 243 Jefferson Ave., Detroit, Mich. McDonald Auto Co., The. Memphis, Tenn. Mitchell Agency of Bridgeport, The, 111 Meigs Building, Bridgeport, Conn. Mitchell Garage, The, 1028 Connecticut Ave., Washington, D. C. Mitchell Automobile Co., The, 1466 Michigan Ave., Chicago, Ill. Mitchell, A. D., Helena, Mont. Mitchell Motor Co. of New York, 1876 Broadway, New York City. Mitchell, Lewis & Staver Co., Portland, Ore. Nelson & Co., John A., Roundrock, Tex. Ohler, J. O., Lima, O. Orey Janssen Automobile Co., 310 Main St., Davenport, Ia. Osen & Hunter Automobile Co., 1st and St. James Sts., San Jose, Cal. Osen & Hunter Automobile Co., 407 Golden Gate Ave., San Francis-

co, Cal. Penn Motor Car Co., 680 N. Broad St., Philadelphia, Pa. Paterson, Jas., Red Cloud, Neb. Plainfield Motor Car Co., 214 Park Ave., Plainfield, N. J. Rambler Automobile Co., 2044 Farnam St., Omaha, Neb. Randall Motor Car Co., 216 W. Berry St., Fort Wayne, Ind. Reid, R. T., Midland, Tex. Rhodes, A., Cooperstown, Griggs County, N. Dak. Robbins, G. D., San Antonio, Tex. Safety Door Hanger Co., Ashland, O. Schmidt Auto Co., Iowa City, Ia. Schug Bros., Berne, Ind. Scott, A. D., 3916 Washington Ave., St. Louis, Mo. Sharman Automobile Co., 109 W. South Temple St., Salt Lake City, Utah. Shenango Valley Automobile Co., Sharon, Pa. Stark-Summit Automobile Co., Alliance, O. Steuerwald Machinery Co., St. Ansger, Ia. Tampa Automobile & Garage Co., The, 312 Washington St., Tampa, Fla. Troy Carriage Works, Troy, N. Y. University Auto Co., 30 Carlton Pl., Rochester, N. Y. Van Benschatens, E., 273 Main St., Poughkeepsie, N. Y. White, J. W., 543 Broad St., Augusta, Ga.

Mitchell Motor Co. of N. Y.—1876 Broadway, New York City. (Mitchell.)

Mitchell, H.—Clerk Haverhill Fire Appliance Co., office 40 Merrimack St.; factory, Island Park, Haverhill, Mass.

Mitchell Co., P. R.—Spring Grove and Harrison Ave., Cincinnati, O. Mfrs. curled hair.

Mitchell, S. Z.—First Vice-Pres. General Vehicle Co., Broadway, and 62d St., New York City.

Miter-gear.—See Gear, Miter.

Mitteldeutsche Gummiwarenfabrik, Louis Peter.—Frankfort-am-Main, Germany. Mfrs. pneumatic rubber tires.

Mixer.—A device for vaporizing gasoline and mixing it with the proper quantity of air to form an "explosive" mixture. (2) Another term for atomizer.

Mixing-chamber.—See Chamber, Mixing.

Mixing-valve.—See Carburetter.

Mixture.—Any fuel for an internal combustion motor, compounded of the vapor of a hydrocarbon and air. The terms "rich" and "fat" are applied to a mixture containing an excess of gasoline, while the terms "lean," "poor" are applied to one containing too little gasoline.

Moak, E. L.—Sec. The Lee Mfg. Co., Conners St., Port Huron, Mich.

Mobile Auto Co.—Mobile, Ala. (Standard-Dayton.)

Mobile Carriage Co.—762 Golden Gate Ave., San Francisco, Cal. (Pierce Arrow, Knox.)

Mobile Motor & Machine Co.—Jane St., Bay City, Mich. Garage.

Mockett Auto Co.—Lincoln, Neb. Garage.

Model Automobile Co.—Peru, Ind. Mfrs. gasoline and automobile motors, gasoline commercial and pleasure automobiles.

Model Garage Co.—645 E. 47th St., Chicago, Ill. Garage.

Model Machine Works.—E. Clinton St., Frankford, Ind. (Holsman.)

Model Mfg. Co., The.—15 Frankfort St., New York City. Mfrs. timograph, tire chains.

Model Pattern Works.—Washington and Perry Sts., Buffalo, N. Y. Mfrs. patterns.

Model Vulcanizing Co.—1547 Michigan Ave., Chicago, Ill. Vulcanizing. Agents for the Motz Clincher Tire & Rubber Co.

Modern Auto Co.—College St., Asheville, N. C. Garage.

Modern Autotop & Equipment Co.—Ontario St., Cleveland, O. Mfrs. automobile tops.

Modern Machine Co.—817 Washington St., Buffalo, N. Y. Repairing.

Modern Tool Co.—4th and State Sts., Erie, Pa. Makers of the Payne Modern car; first marketed in 1906. Three models made since. Cap. \$200,000. F. L. Gallagher, Gen. Mgr.; G. J. Loomis, Designer; G. F. Shafer, Supt.; W. S. McLaugh-Vice-Pres.; W. L. Van Sicklin, Sec. and Treas.

Modoc Co.—Foot of Market St., Chester, Pa. Mfrs. oils, automobile body polishes, automobile body soaps.

Moe, B. P.—Watertown, S. D. (Rambler.)

Moessner, Emil D.—Treas. Brush Runabout Co., 14-16 Baltimore Ave., W., Detroit, Mich.

Moffett, F. L.—Sec. and Treas. Jordon Automobile Co., 217 4th St., Minneapolis, Minn.

Moffett, T. J.—Sec. and Treas. Hatcher Automobile Parts Co., 2108 Superior Ave., Cleveland, O.

Mogerrity, B. F.—Shreveport, La. (Caddillac.)

Mohawk Electric Co.—1554 Union St., Schenectady, N. Y. Mfrs. wire terminals.

Mohawk Machine Shop.—Main St., Fonda, N. Y. Garage.

Mohawk Valley Automobile Co.—Albany, N. Y. (Knox.)

Mohler & De Gress.—La Independencia 12, Mexico City, Mexico. (Rapid, Thomas Flyer, Monarch, Dragon, Stevens-Duryea, Pierce Arrow.)

Mohler, C. M.—Supt. American Motor Car Co., Indianapolis, Ind.

Moise, E. W., Jr.—Sumter, S. C. (Buick.)

Moline Auto Co.—East Moline, Ill. Makers of the Moline car; first marketed in June, 1904. Five different models made since. Cap. \$100,000. W. H. Van

Dervoort, Pres., Gen. Mgr., Designer and Purch. Agt.; H. A. Soverhill, Vice-Pres.; Rufus Walker, Jr., Sec. and Treas.; E. Gruenewald, Supt.; E. W. Nicholson, Sales and Advt. Mgr. Agents and dealers: Ambrose, A. O., 6125 Bartmer Ave., St. Louis, Mo.; Benz, Walter G., 317 3rd St., Minneapolis, Minn.; City Hall Automobile Co., San Francisco, Cal.; Deere Plow Co., John, Omaha, Neb.; Gregory, Wm., Los Angeles, Cal.; Hipp, J. C., 347 Euclid Ave., Cleveland, O.; Sharman Automobile Co., Salt Lake City, Utah; Simmons & Francis, Flandreau, S. D.; Warner & Co., 1502 Michigan Ave., Chicago, Ill.; Wicke, J. A., Van Horne, Ia.

Moline Malleable Iron Co.—St. Charles, Ill. Mfrs. malleable iron castings.

Moline Pump Co.—Moline, Ill. Makers of gasoline automobile and marine motors, dry batteries, pumps, tanks, etc. Cap. \$100,000. E. H. Sleight, Pres., Gen. Mgr., Purch. Agt., Sales Mgr. and Advt.; C. E. Dietz, Sec.; J. W. Barnud, Treas.; E. B. Parkhurst, Designer and Supt.

Mom, Ateliers de Constructions Mechaniques.—173 Bvd. Péreire, Paris, France. Mfrs. motorcycles, tricars, automobile motors. (Mom.)

Moment, Magnetic.—The product of the strength of one pole of a magnet by the distance between the poles.

Moment of Force.—The product of the amount of a force by its perpendicular distance from a given point. Such product is called its "turning moment" and "torque." See Torque.

Momentum.—"Momentum" is mass and motion, and may be measured by its mass or weight multiplied by its velocity, or by force multiplied by the time during which the force has been applied. It may be taken as representing the "quantity of motion" of a moving body.

Monahan Antiseptic Co.—92 Market St., Chicago, Ill. Mfrs. automobile body soaps.

Monarch Fire Appliance Co.—249 Pearl St., New York City. Mfrs. fire extinguishers.

Monarch Instrument Co.—Cleveland, O. Mfrs. ammeters and voltmeters.

Monarch Mfg. Co.—Toledo, O. Mfrs. grease, oils, metal polish.

Monarch Motor Car Co.—16th and Arnold Sts., Chicago Heights, Ill. Makers of the Monarch cars; first marketed in 1905. Four models made since. Cap. \$150,000. T. A. Quinlan, Jr., Pres. and Gen. Mgr.; J. A. Ward, Sec. and Treas.; J. J. Boucher, Supt. and Designer; Paul Symonds, Purch. Agt. Branches: Monarch Motor Car Co. of San Francisco, San Francisco, Cal.; H. Sherwood, Mgr. Dealers: Hill & Beeson, Indianapolis, Ind.; M. A. Shuey, South Bend, Ind.; Big

Four Automobile Co., Los Angeles, Cal.; Buckeye Automobile Co., Cincinnati, O.
Monarch Rubber Co.—41 N. 7th St., Philadelphia, Pa. Mfrs. rubber mats, cloth and carpet trimmings.

Monarch Vulcanizing Works.—26 Rush St., Chicago, Ill. Tire repairing.

Mondsheim, Edouard.—10 Ave. Parmentier, Paris, France. Mfr. radiators.

Mongollon Motor Road Co.—Silver City, N. Mex. (Reo.)

Monier et Martin.—63 Bvd. de la Republique, Nismes, France. Mfrs. clutches.

Monier, Seitert et Pommeret.—14 rue St. Mour, Paris, France. Mfrs. metallic rims.

Monin, Felix.—32 rue Croix-Jordan, Lyons, France. Mfr. acetylene lamps.

Monitor Speed Recorder Co.—274 Pearl St., Cambridge, Mass. Mfrs. timers, speedometers.

Monjardet.—21 rue Richelieu, Paris France. Mfr. wearing apparel, coats hats and caps.

Monk, Frank.—Supt. American Oak Leather Co., Kenner St. and Dalton Ave., Cincinnati, O.

Monkey-wrench.—See Wrench, Monkey.

Monmouth Automobile Club.—Geo. W. Pittenger, Sec., Asbury Park, N. J.

Monmouth Garage.—Heck St. and Lake Ave., Asbury Park, N. J. Garage. (Columbia and Ford.)

Monnich, Bernard.—Dodge County Bank Bldg., Hooper, Neb. (Holsman.) Est. 1902.

Monning, G.—Warschauerstrasse 5, Berlin, Germany. Mfr. elastic wheels.

Monnot & Sacher.—Salesroom and garage, 305 S. Market St., Canton, O. Garage; repairing.

Monogram, Crest & Sign Co.—125 E. 86th St., New York City. Mfrs. license numbers, monograms, name plates, steel stamps and stencils.

Monoplane.—A type of aeroplane constructed by M. Pelterie, consisting of a long central body and a single transverse plane which is somewhat curved from front to rear edge. At the rear of the body is a flat plane which is used as a rudder, while the motor and propeller are placed at the front of the main body. The machine is provided with a 25—30 h.p. motor of seven cylinders, staggered and arranged in a circle.

Monroe Garage.—202 Monroe St., Brooklyn, N. Y. Garage.

Monroe Garage Co.—Stroudsburg, Pa. Garage.

Monroe, John B.—Powelton, Ill. (Waltham.) Est. 1898.

Monson Auto Co.—1466 Michigan Ave., Chicago, Ill. Garage.

Montague Automobile Co.—Chanute, Kan. Garage.

Montana Garage Co.—Butte, Mont. (Glide.)

Montandon-Robert.—2 Place de la Fusterie, Geneva, Switzerland. Mfr. speed indicators.

Montanus, Edw. J.—Sec. The Springfield Machine Tool Co., Southern Ave., Springfield, O.

Montanus, Paul A.—Vice-Pres. and Gen. Supt. The Springfield Machine Tool Co., Southern Ave., Springfield, O.

Montanus, P. E.—Pres. The Springfield Machine Tool Co., Southern Ave., Springfield, O.

Montauban-Marchandier, Société Anonyme des Établissements.—33 Ave. Fairherbe, St. Quentin, France. Mfrs. automobile motors. (Vautour motors.)

Montclair Auto Station.—Bloomfield Ave. and Valley Rd., Montclair, N. J. Garage.

Monte Cristo Garage.—New London, Conn. (Pullman.)

Montgomery Auto Co.—Montgomery, Ala. (Cadillac.)

Montgomery Auto Transfer.—207 Monred St., Montgomery, Ala. Rental service.

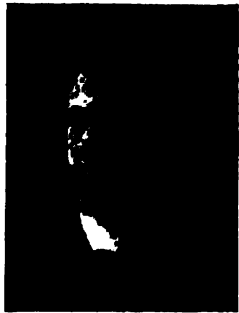
Montgomery, H. C.—Shelbyville, Ind. (Haynes.)

Monumental Garage, The.—1002 Morton St. C. Price Schuler, Mgr. (Pungs-Finch, Maxwell-Briscoe.) Garage and repairing.

Moody, C. F.—Devil's Lake, N. Dak. (Buick.)

Moody, V. H.—Treas. Worcester Steel Foundry Co., Milbury, Mass.

Mooers, Louis P.—Designer and a racing man, formerly with the Peerless Motor Car Co. and now with the Moon Motor Car Co. Participated in the Bennett Cup race in 1903 and designed the Peerless Green Dragon, which was driven so successfully on the track by



Barney Oldfield. Designer of the Moon and of the new Hol-Tan car. Address care Moon Motor Car Co., St. Louis, Mo.

Moon Apex Brake Co., The.—3d and Porter Sts., Detroit, Mich. Mfrs. brakes.

Moon, C. D.—Eau Claire, Wis. (Franklin.)

Moon Motor Car Co.—Main and Cornelia Sts., St. Louis, Mo. Makers of the Moon car, and of the Hol-Tan car for the Hol-Tan Co., New York City. Agents and dealers for the Moon car: Ennis, Geo. H., 215 Currier Bldg., Los Angeles,

Cal.; Schmidt, C. E., Motor Car Agencies, 445 Golden Gate Ave., San Francisco, Cal.; Richter Bros., 2406 Grand Ave., Kansas City, Mo.; Yowell, Jos. E., Nashville, Tenn.

Mooney, J. E.—Pres. American Oak Leather Co., Kenner St. and Dalton Ave., Cincinnati, O.

Moons, Shiras.—Sec. and Treas. Hart & Hegeman Mfg. Co. Hartford, Conn.

Moore & Babcock.—429 Wabash Ave., Chicago, Ill. Morgan & Wright tires. (Reliance.)

Moore & Munger Co.—602 W. 42d St., New York City. Mfrs. wood and metallic bodies, dashes and fenders, hoods.

Moore & Son, M. E.—Westfield, Mass. Mfrs. acetylene generators.

Moore Auto Co.—Lincoln, Neb. (Monarch.)

Moore Automobile Co.—Walla Walla, Wash. (Franklin.)

Moore, B. H.—Vice-Pres. George P. Moore Co., Inc., 721 Golden Gate Ave., San Francisco, Cal.; 1005 S. Main St., Los Angeles, Cal.; 231 12th St., Oakland, Cal.; 332 Broadway, New York City.

More, Case, Lyman & Herrick.—159 La Salle St., Chicago, Ill. Mgrs. of Chicago Branch of the Boston Insurance Co., Boston, Mass. Insure against fire and theft.

Moore Drop Forging Co.—Springfield, Mass. Mfrs. drop forgings, wrenches.

Moore Edenfield Elec. & Mfg. Co.—1033 Broad St., Augusta, Ga. (Franklin, Cadillac.) Est. 1891. Not inc. R. J. Edenfield, Sole Owner. Garage, 10 cars; repairing.

Moore, E. E.—Middlesex Sq., Marlboro, Mass. (Lambert.)

Moore, F.—Pres. Plimley Automobile Co., Victoria, B. C.

Moore, F. C.—San Bernardino, Cal. (Maxwell.)

Moore, F. L.—Vice-Pres. and Head of Sales Dept., Fisher Auto Co., 330 N. Illinois St., Indianapolis, Ind.

Moore, F. T.—Treas. E. Keeler Co., 3d and West Sts., Williamsport, Pa.

Moore Fuel & Feed Co.—Bisbee, Ariz. (Maxwell.)

Moore, Geo. P.—Pres. Geo. P. Moore Co., Inc., 721 Golden Gate Ave., San Francisco, Cal.; 1005 S. Main St., Los Angeles, Cal.; 231 12th St., Oakland, Cal.; 332 Broadway, New York City.

Moore Co., Inc., Geo. P.—721 Golden Gate Ave., San Francisco, Cal.; 1005 S. Main St., Los Angeles; 231 12th St., Oakland, Cal.; 332 Broadway, New York City. Mfrs. metal polish, tire and lamp covers, handles, automobile supplies and accessories. Cap. \$50,000. Est. 1902. Geo. P. Moore, Pres.; B. H. Moore, Vice-Pres.; Jno. J. Aris, Sec. and Treas.; E. J. Thibault, Mgr. Oakland Branch; R. Van Zandt, Mgr. Los Ange-

les Branch; H. D. Simons, Eastern Buyer, New York.

Moore, Harry.—Supt. National Motor Vehicle Co., E. 22d St., Indianapolis, Ind.

Moore, Harry S.—1761 Crawford Rd., Cleveland, O. (Stoddard-Dayton.) Est. 1896. Garage; repairing.

Moore, Henry.—Designer Auburn Auto Co., Auburn, Ind.

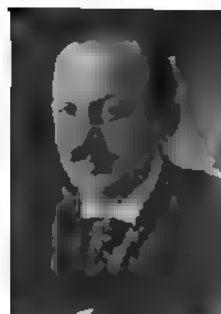


Photo by Spencer & Wells.

Moore, Thomas Francis.—Publicity Promoter B. Niagara Falls, N. Y., June 20, 1865. Ed. Sellecko Preparatory, Norwalk, Conn., Riverview Military Academy, Poughkeepsie, N. Y. Res. 91 W. 103d St., New York City.

Moore, J. G.—809 Euclid Ave., Cleveland, O. (Dolson.)

Moore, S. H.—Sec. and Treas. Republic Belting & Supply Co., 1616 W. 3d St., Cleveland, O.

Moore-Smith Co.—Boston, Mass. Mfrs. automobile robes, miscellaneous wearing apparel.

Mora Motor Car Co.—Newark, N. J. Makers of the Mora Car; first marketed in 1906. Cap. \$750,000. S. H. Mora, Pres. and Gen. Mgr.; T. W. Martin, Vice-Pres.; W. N. Freeman, Sec. and Treas., also Sales Mgr.; Geo. Whitney, Supt.; J. L. Willard, Purch. Agt.; F. A. Partenhimer, Advt. Mgr.

Mora Motor Car Co.—1218 Michigan Ave., Chicago, Ill. (Mora)

Mora Motor Car Co. of New York.—52d St. and Broadway, New York City. W. W. Burke, Mgr. (Mora.)

Mora Motor Car Co.—Newark, N. J. Garage.

Mora, S. H.—Pres., Gen. Mgr. Mora Motor Car Co., Newark, N. J.

Moran Flexible Joint Co.—149 3d St., Louisville, Ky. Mfrs. universal joints

Morawetz, Co.—Milwaukee, Wis. Mfrs. automobile robes, wearing apparel, caps, gloves and gauntlets, miscellaneous wearing apparel.

More Bros.—Wimbledon, N. D. (Lambert.)

Morel, C.—Head Repair Dept. Cryder & Co., 583-585 Park Ave., New York City

Moreland, D. J.—Supt. Rapid Motor Vehicle Co., Rapid St., Pontiac, Mich.

More-Power Co.—619 Gorham St., Lowell, Mass. Jobbers ammeters, voltmeters, spark plugs, tire sleeves. Est. since 1905. Geo. H. Runels, Mgr., Lowell, Mass.; T. P. Driver, Head Mechanical Dept.

Morfin, Carlos.—Aguascalientes, Mexico. (Wayne.)

Morgan & Co., Henry.—Montreal, Canada. (Maxwell-Briscoe, Daimler.)

Morgan & Co., Ltd.—10 Old Bond St., London W., England. Mfrs. bodies, tops.

Morgan & Wright.—214 W. 47th St., New York City; 81 Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 1829 Euclid Ave., Cleveland, O.; 405-411 E. 3d St., Dayton, O.; 708 Hennepin Ave., Minneapolis, Minn.; 538 N. Vandeventer Ave., St. Louis, Mo.; 423-433 Golden Gate Ave., San Francisco, Cal.; 4) Forsyth St., Atlanta, Ga.; 118-122 E. 10th St., Los Angeles, Cal.; cor. 13th and Cherry Sts., Philadelphia, Pa.; 379 Washington St., Buffalo, N. Y. Suppl'es. Detroit, Mich. Mfrs. tire cement, tire patches, tire tools, inner tire tubes, pneumatic and solid tires.

Morgan, B.—Old Beach Rd., Newport, R. I. Mfr. hose couplings, single inlet valves, balanced check valves for 2-cycle motors. Est. 1904.

Morgan, B. G.—Vice-Pres. E. J. Jones Co., Inc., Arlington Heights, Mass.

Morgan Chain & Pedal Co., Ltd.—Floodgate St., Birmingham, England. Mfrs. chains

Morgan, Chas.—Pres. New Amsterdam Motor Co., 152 W. 56th St., New York City

Morgan, C. L.—Pres. Stark Summit Auto Co., 512 Arch Ave., Alliance, O.

Morgan, Fred L.—Mgr. Stark Summit Auto Co., 512 Arch Ave., Alliance, O.

Morgan Spring Co.—Worcester, Mass. Mfrs. machinery springs.

Morgan, W. E.—Joplin St., Joplin, Mo. Garage.

Morgan, William H.—Treas. Bryant Garage, 50-56 W. 43d St., New York City

Morgan, William James.—Automobile Editor New York



Globe. B. Glamorganshire, Wales, Great Britain. Oct. 8, 1862. Ed. British schools. Mem. N. Y. A. & M. N. Y. Motor, Florida East Coast Auto Assn. Res. 200 Fairmount Ave., Newark, N. J. Office, Bretton Hall, 85th St. and Broadway, New York City. In the automobile trade since 1900. Established the Florida Beach and White Mountain tournaments.

Photo by Spencer & Wells.

Moriarty & Co., E. P.—1612-14 Grand Ave., Kansas City, Mo. (Packard, Stevens-Duryea.) Est. 1901 in automobile business, 1891 in cycle business. Not inc. E. P. Moriarty and J. F. Moriarty partners. Hd. Executive Dept., E.

P. Moriarty; Sales Dept., J. F. Moriarty; Garage, E. R. Sanborn; Repair, John Caps. Garage, 50 cars. Repairing cars represented.

Moriarty, E. P.—Hd. Executive Dept. of E. P. Moriarty & Co., 1612-14 Grand Ave., Kansas City, Mo.

Moriarty, J. F.—Hd. Sales Dept. E. P. Moriarty & Co., 1612-14 Grand Ave., Kansas City, Mo.

Morin, Veuve.—Mohon, Ardennes, France. Mfr. wood rims.

Morley, Jas. F.—220½ S. Spring St., Los Angeles, Cal. (Royal, Coppock.)

Morman, S. A.—Vice-Pres. and Director Wilmarth and Morman Co., 585 Canal St., Grand Rapids, Mich.

Morrell, Robert Lee.—Lawyer. B. New York City. July 13, 1866. Ed.

Philips Exeter Academy, Columbia College Law School, N. Y. University Law School. Mem. A. C. A., The Strollers. Res., 7 E. 32d St. Address 15 William St., New York City. Owned first car in 1900. Chairman of the Rac-



ing Board of the American Automobile Association during 1905, and of the Contest Committee of the Automobile Club of America for a number of years. Successfully conducted the second Vanderbilt Cup race, the sealed bonnet contest of the Automobile Club of America in 1907 and many other events.

Morrill, C. G.—Asst. Treas. Pennsylvania Rubber Co., Jeannette, Pa.

Morrill Motor Car Co., E. C.—5 Raitts Court, Portsmouth, N. H. (Premier.)

Morris, A.—Columbus Grove, O. (Cadillac, Buick, Franklin.) Est. 1902. Garage, 10 cars. Repairing.

Morris, Dave Hennen.—Lawyer. B. New Orleans, La., April 24, 1872. Grad.

Harvard Univ., A. B. (magna cum laude honors in English, French and music). 1896; N. Y. Law Sch., L.L.B., 1901. Sec. and Treas. Van Nest Land and Improvement Co. Director Mutual Trust Co. of N. Y. and Port Chester R. R. Co.



Was Pres. N. Y. Med. Coll. and Hosp.

for Women, 1897-98. Recreations: Automobiling, yachting, thoroughbred racing. Mem. clubs: A. C. A. (Pres. 1905-06). Metropolitan, University, Racquet. Address, 68 Broad St., New York City.

Morris & Bailey Steel Co.—Ger. Nat'l. Bank Bldg., Pittsburg, Pa. Mfrs. steel.

Morris Auto Garage.—Fulton St., Cor. Merrick Rd., Jamaica, N. Y. Supplies; garage; repairing.

Morris Bros. Automobile Co.—149 E. 4th St., Plainfield, N. J. (Holsman, Ford, Maxwell.)

Morris, Francis B.—Scull-Morris Motor Co., 258 N. Broad St., Philadelphia, Pa.

Morris, J. M.—Supt. Trebert Gas Engine Co., 35-37 Ford St., Rochester, N. Y.

Morris, L. I.—Vice-Pres. Tindel-Morris Co., Eddystone, Pa.

Morris Motor Car Co.—Liberty St., Morris, Ill. Garage.

Morris Park Motordrome Club.—Times Bldg., 42nd St. and Broadway, New York City. Organized Sept., 1907. Joseph G. Robin, Pres.; Walter C. Allen, Sec. and Treas.

Morris, R. H.—1818-20 Telegraph Ave., Oakland, Cal. (Pope-Waverley.)

Morrison & Price Co.—169 Huntington Ave., Boston, Mass. (Rainier.)

Morrison Auto Co.—3916 Washington Ave., St. Louis, Mo. (Welch.)

Morrison Bros.—310 Harrison St., Syracuse, N. Y. Garage.

Morrison, C. H.—603 Kansas Ave., Topeka, Kan. (Studebaker.)

Morrison Co., A. E.—93 Massachusetts Ave., Boston, Mass. (Stearns, Oldsmobile.)

Morrison, Geo. H.—Grand Rapids, Mich. (Waltham.)

Morrison, McIntosh & Co.—63 Broad St., Grinnell, Ia. Mfrs. wearing apparel, gloves and gauntlets.

Morrison, Robert.—Lisbon, O. Garage.

Morse Chain Co.—Trumansburg, N. Y. Mfrs. chains.

Morse, C. H.—Pres. Fairbanks, Morse & Co., Franklin and Monroe Sts., Chicago, Ill.

Morse & Son, C. H.—13 S. Water St., Rochester, N. Y. Mfrs. license numbers, name plates.

Morrissey's Automobile Sta.—Pine and Shamrock Sts., Stockbridge, Mass. (Rambler.)

Morrisville Foundry Co.—Morrisville, Vt. Repairing.

Morrow & Bretthauer.—John and North St., Middletown, N. Y. (Rambler, Ford, Frontenac.)

Morrow-Thomas Hardware Co.—Amarillo, Tex. (Northern.)

Mors, Emil.—14 Boulevard Emile-Angier, Paris, France. B. Paris, 1859.



Chevalier of the Legion of Honor, officer of the Académie, Chevalier of the Mérite Agricole. Technical Director of the Mors Automobile Société, Vice-President of the Syndical Chamber of the Automobile. Engineer of Arts and Manufactures. Began the manu-

facture of steam cars in 1885, and afterward that of gasoline cars.

Mors, Société Anonyme d'Automobiles.—48 rue du Théâtre, Paris, France. Mfrs. gasoline automobiles. (Mors cars)

Morse, E. C.—Comm. Mgr. E. R. Thomas Motor Co., 1200 Niagara St., Buffalo, N. Y.

Morse, Jr., E. W.—Sumter, S. C. Garage.

Morse, Frank H.—Purch. Agt. Nevada Auto & Supply Co., 115 Ramsey St., Goldfield, Nev.

Morse, I. J.—245 N. Broad St., Philadelphia, Pa. (Locomobile.)

Morse, R. F.—74 Weybosset St., Providence, R. I. Mfrs. gaskets

Morse, T. S.—Lenox, Mass. Garage; repairing and supplies

Morse, Walter G.—Treas. and Advt. Mgr. Atlas Motor Car Co., Burnie Ave., Springfield, Mass.

Morse, Williams & Co.—W. End Trust Bldg., Philadelphia, Pa. Mfrs. steering apparatus.

Mortenson, George.—Mgr. Repairing and Storage Dept., Wyckoff, Church & Partridge, Broadway and 56th St., New York City.

Mortise.—A hole, usually rectangular, cut to receive a tenon. See Tenon.

Mortland Automobile Co.—12th and Oak Sts., Oakland, Cal. (Glide.)

Morton Marine Motor Co.—3d and Milton Sts., Camden, N. J. Mfrs. gasoline marine motors.

Morton, R. E. L.—Hanford, Cal (Maxwell.)

Mosehart & Keller Co.—Houston, Tex. (Buick.)

Moseley, O.—Peru, Ind. (Holsman.)

Moseley & Sons, Ltd., David.—Ardwick, Manchester, England. Mfrs. pneumatic tires.

Moshier, Frank P., Jr.—Greenwich, Conn. (Ford.)

Mosher, M. E.—Prop. Mosher Sales Co., 32 St. Paul St., Rochester, N. Y.

Mosher Sales Co.—32 St. Paul St., Rochester, N. Y. Mfrs. oilers. Not inc. Est. January, 1906. M. E. Mosher, Prop.

Mosler, A. R.—Pres. A. R. Mosler & Co., 163 W. 29th St., New York City.

Mosler & Co., A. R.—163 W. 29th St., New York City. Mfrs. spit-fire spark plugs, triumph plugs, timers, distributors, spark levers. Mem. M. & A. M. Cap. \$30,000. Est. 1901. A. R. Mosler, Pres.; Wm. G. Lieblich, Treas. and Sec.

Mosley-Haigler Electric Co.—Montgomery, Ala. (Stoddard-Dayton.) Garage.

Mossberg Co., Frank.—S. Main and Mill Sts., Attleboro, Mass. Mfrs. motor car bells, metal stampings, adjustable wrenches, wrenches. Cap. \$110,000. Est. 1808.

Motley Auto Livery, C. W.—349 Michigan Ave., Chicago, Ill. Garage.

Motobloc Agency.—244 W. 69th St., New York City. (Motobloc.) Est. 1906. Repairing only Motobloc cars.

Motobloc, Société Anonyme des Automobiles.—102 rue des Vivants, Bordeaux, France. Mfrs. gasoline automobiles. (Motobloc cars.)

Motocycle, Le.—Pub. at 56 rue Pergolesse, Paris, France.

Motocyclette Griffon.—40 rue Louis-Blanc, Courbevoie, France. Mfrs. motorcycles. (Motocyclette)

Motocyclette, La.—Pub at 2 Ave. Victoria, Paris, France

Motor.—See Machine.

Motor-boat.—See Boat, Motor.

Motor-couple.—See Couple, Motor.

Motor Cycle.—See Cycle, Motor.

Motor-cycle.—A two-wheeled or sometimes three or four wheeled cycle driven by a motor and usually furnished with pedals. The motor drives the wheel by belt, chain or propeller-shaft, or even directly by spur-wheels, and is usually started by the pedals or by a crank. There is usually but one speed, but sometimes two or three. Motor-cycles carry but one person, the driver, although some makers produce arrangements for carrying another on an auxiliary framing, or on a forward seat converting the motor-cycle into a tricycle. When furnished with four wheels it becomes a quadricycle or "quad."

The motor-cycle is furnished with a motor of 1, 2 or 4 cylinders, varying from 1 to 15 h.p., the latter for speeding.

Motor, Double-opposed.—A motor in which the cylinders are horizontal, with



their open ends toward each other, and the crank-shaft, which is two-throw, 180°, lying between them. The pis-

tons thus slide in opposite directions, and the weight of one being balanced by the other, the vibration is thereby reduced

The horizontal double-opposed type is considered the most satisfactory for low powers.

Motor, Electric.—Electric motors are divided into continuous and alternating current motors. The first are merely dynamos to which is furnished a current for collecting the mechanical energy. In fact, dynamos are, as is well known, reversible.

Since the efficiency of a dynamo as a motor is sensibly equal to its efficiency as a generator, the mechanical power that can be collected on the shaft equals 0.80 to 0.95 of the electric power furnished at the terminals. The winding of the motors varies according to their applications. Independent excitation may be employed with advantage in the motors of automobiles. It permits of recuperating in descents or of braking by the motor without reversing the connections.

The series excitation is employed when there is no need of great regularity and it is necessary to exert a great stress in starting (tramways, hoisting apparatus, etc.) The direction of revolution of a series machine is the reverse of that in which it revolves as a generator. In order to make it revolve in the same direction the connections of the inductor must be reversed. Shunt excitation is employed for constant speed motors supplied at a constant potential. The couple is nil at starting, and this is an inconvenience. The machine revolves in the same direction as a motor or a generator, and, for recuperation, possesses the same properties as independent excitation.

Compound excitation participates in the properties of the two preceding, in cases in which the windings are concordant. The velocity is absolutely constant with the differential winding, in which the shunt spirals are preponderant, and the starting automatic, if the resistant stress is not too great. Special precautions are necessary for the starting by reason of the fact that the series winding is alone excited, and this may cause the machine to revolve in the wrong direction and sometimes to oscillate.

Motor, Gas.—See Gas, Motor.

Motor, Gasolene.—An internal combustion motor in which is utilized the energy contained in air charged in a cold state with the vapor of gasolene (dens. = 0.680 to 0.710). The usual gasolene motors are almost all four-cycle ones and are applied to automobiles.

Nearly all these motors are provided with mechanically operated inlet-valves, which are in most cases placed symmetrically with the exhaust-valves and operated by a special cam-shaft that actu-

ates also the ignition mechanism. The control of the inlet permits of a more exact operation of the motor by producing the opening and closing of the valve exactly at the point desired, while the automatic valve often sticks on its seat and is noisy and unreliable in its operation. The mechanically operated valve, moreover, increases the density of the cylinder volume, and hence the power of the motor. It is well adapted for low speeds and especially improves the operation at high speeds. Finally, it rids the motor of the disagreeable sniffing sound made by the inlet-valves when the motor is slowed down. See Motors, Internal Combustion.

Motor, Hanger-bolts.—See Hanger-bolts, Motor.

Motor, Hydrocarbon.—The same as Gas-motor.

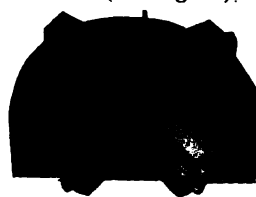
Motor, Kerosene.—An internal combustion motor in which is utilized the calorific energy contained in air charged with the vapor of kerosene (dens. = 0.800). From a mechanical point of view the kerosene-motor differs little from its gas or gasolene congeners and is, so to speak, a four-cycle engine. Since kerosene has, at the ordinary temperature, hardly any vapor tension, it must, in order to mix it with air, be vaporized. It is therefore injected by a pump into a vaporizer heated by a burner at the outset, and in operation by the exhaust, or else is atomized in an injector or traversed by hot air. Certain modern carburetters are designed with a view to permit of the operation of a motor with any kind of liquid hydrocarburet. They almost always possess the drawback of reducing the value of the cylinder-volume by the excessive heating of the air or the strong depression sometimes designedly utilized for effecting the evaporation of the liquid at a low temperature.

Motor, Naphthalene.—An internal combustion motor in which the starting is effected by means of gasolene, and which is afterwards supplied by naphthalene vapor produced in a vessel heated by the exhaust and into which small portions of this substance drop regularly.

Motor-power.—See Power, Motor.

Motor-pressure.—See Pressure, Motor.

Motor, Revolving-cylinder.—An arrangement employed on the Adams-Farwell car. (see figure), the three or five



cylinders of which are equally spaced around a vertical axis and revolve around a stationary crank-shaft, and power is transmitted by bevel-gear from

the revolving crank-case. The weight of the cylinders dispenses with the need of a fly-wheel and their motion gives an efficient air cooling without fans or other mechanism.

Motor-shaft.—The main shaft of an engine.

Motor, Six-cylinder.—A motor which has crank-shafts of a construction similar to those of a three-cylinder motor (i. e., with cranks set at 120°), and which produces six power-strokes during two revolutions, with the best balance that can possibly be obtained without an excessive number of cylinders. A power-stroke occurs at every 120° that the crank-shaft revolves, and, since each power-stroke lasts for half a revolution, or 180° , one stroke begins when the previous one is only two-thirds complete. This results in a very steady application of power, since the crank-shaft is at all times operated by the driving effect of the combustion-strokes, and the motor can be run smoothly at greatly varying speeds through a control of the position at which the spark jumps in the combustion-space, and the admission of a greater or less quantity of the mixture during the inlet-stroke.

Some of the advantages claimed for the six-cylinder motor are: that it runs slower on high gear; that it picks up speed faster and easier on the throttle; that it has less vibration; that it runs with a silence unknown to the four-cylinders; that it makes gear-shifting almost unnecessary; and that it is much better adapted for hill-climbing. In Europe the superiority of the six-cylinder is generally admitted. In this country a number of leading makers have been experimenting with it for some time, but, as yet, have found great difficulty in coping with American road conditions.

Motor, Starting a.—Before starting a gasoline motor, the following precautions should be taken. It should be seen that the clutch-lever is in the proper position, that the brakes are set, and that the spark-lever is fully retarded. The starting-crank should never be grasped with both hands, but with one hand only. The body should be kept clear of the crank. Lastly, to avoid accidents, never push down on the starting-crank, but always up to start the motor. What is called starting "on spark" is effected as follows: When a four-cylinder motor comes to rest the cranks stand at an angle of from 60° to 90° with respect to the vertical, and, since the timer has been making contact on or before center while in operation, the commutator pauses between the contact-points as it comes to rest. Retarding the spark-lever rotates the timer, which follows the pis-

ton, and, making contact, fires the charge retained in the cylinder. The spark-lever is then advanced to neutral and the next cylinder fires on center. Neutral position of the spark-lever ignites the charge on center on all four-cylinder cars that start "on spark." See Starters. Automatic.

Motor, Steam.—See Steam-car.

Motor, V-shaped.—A type of two-cylinder motor first employed by Daimler and Panhard and Levassor, and in which vertically at an angle of 30° to each other, giving them the aspect of a large V, whence their name.



were placed name of "V-shaped motors." The figure represents a V-shaped motor of the Marmon car.

Motor & Accessory Manufacturers.—Room 414, Union Bldg., Newark, N. J. Organized March 2, 1904. To promote in all lawful ways the interests of makers of motors, motor parts and accessories; to aid in the protection of the members of said corporation and secure the advantages to be obtained by mutual co-operation. H. S. White, Pres., Shelby Steel Tube Co., Pittsburg, Pa.; H. E. Raymond, 1st Vice-Pres., The B. F. Goodrich Co., Akron, O.; W. H. Crosby, 2d Vice-Pres., The Crosby Co., Buffalo, N. Y.; E. W. Beach, 3d Vice-Pres., Mfrs. Foundry Co., Waterbury, Conn.; W. S. Gorton, Treas., The Standard Welding Co., Cleveland, O.; P. S. Steenstrup, Sec., Hyatt Roller Bearing Co., Newark, N. J. Former Pres.: D. J. Post, Hartford, Conn.; H. Winfield Chapin, Syracuse, N. Y.

Motor & Mfg. Works.—Geneva, N. Y. Mfrs. mufflers, cut-off mufflers.

Motor.—2 Duane St., New York City. Pub. monthly by New Publication Co. G. H. Willson, Pres.; George Von Utassy, Treas.; C. J. Shearn, Sec.

Motor, The.—Pub. at 7 Rosebery Ave., London, England.

Motor Accessories Co.—14 Dutch St., New York City. Agents for siren horns and folding automobile chairs.

Motor Age.—1200 Michigan Ave., Chicago, Ill. Pub. weekly by the Class Journal Publishing Co. Charles P. Root, Editor.

Motor Boat.—1133 Broadway, New York City. Pub. monthly by the Motor Boat Publishing Co. Louis Neuman, Pres. and Treas.; Wm. Neumann, Vice-Pres.; Geo. S. MacDonald, Sec.; E. P. Prial, Editor.

Motor Boat.—Pub. at 7 Rosebery Ave., London, England.

Motor Boat Club of America.—Station

"A," 108th St. and Hudson River, New York City. Station "B," Jamaica Bay, N. Y. Organized October, 1905. "To arrange for pleasure runs and to encourage contests of all kinds among owners of motor boats and between motor boats of this and foreign clubs; to advance, foster and support the sport of motor boating." Edward J. Schroeder, Commodore; Joseph H. Hoadley, Vice-Commodore; Seymour Oppenheimer, M. D., Rear Commodore; Hugh S. Gambel, Sec., 314 Madison Ave., New York City; Charles Francis, Treas.; Dr. J. Lewengood, Fleet Surgeon; Alfred E. Luders, Official Measurer. Chairmen of Committees: John D. Roach, Board of Governors; Charles P. Tower, Regatta Committee; Dr. Louis Neumann, Membership Committee; Franz A. Wittig, House Committee; Thomas Fleming Day, Library Committee; Hugh S. Gambel, Entertainment Committee; John D. Roach, Ways and Means Committee. Former Commodore, A. D. Proctor Smith. Contests or races promoted, dates and results: National Motor Boat Carnival, Sept., 1906; American championship events, Jamestown Exposition Motor Boat Carnival, Sept. 4 to 11, 1907; National Motor Boat Carnival Race Week, Sept. 23-28, 1907, for international and national championships. For the first time in the history of the motor boat sport in this country this club sent the "Dixie" to England, where she won the British International Trophy (Harmsworth Cup), being the only challenger and representing America. The Motor Boat Club of America is recognized by the representative foreign motor boat clubs as America's leading and representative club and all entries for international events are made through this club.

Motor Boating.—138 Liberty St., New York City. Pub. monthly by The Motor Boating Co., W. L. Dudley, Editor.

Motorboot, Das.—Pub. at 89 Lutstrasse Deutsches Kolonialhaus, Berlin W., 35. Germany.

Motor Car Agencies.—445-49 Golden Gate Ave., San Francisco, Cal. (Wayne, Moon, Logan, Renault, Johnson.)

Motor Car Co.—Mount Royal and Maryland Ave., Baltimore, Md. (Peerless, Thomas Flyer, Stanley, Baker, Waltham, Knox, Stevens-Duryea.)

Motor Car Co.—1314 New York Ave., Washington, D. C. (Peerless, Thomas Flyer, Stevens-Duryea, Columbus.)

Motor Car Co.—Detroit, Mich. Makers of the Cartercar, gasoline pleasure and commercial cars. Agents and dealers: Bindner Auto Co., Bay City, Mich.; Blessing, J. W., Rising Sun, O.; Capron, J. H., Ord, Neb.; Cartercar Auto Co., San Francisco, Cal.; Cartercar Co., 249 3rd Ave., S. Minneapolis, Minn.; Colonial

Automobile Co., 5518 Walnut St., Pittsburgh, Pa.; Christ, Scott & Parshall, Cooperstown, N. Y.; Elgin Hardware Co., Elgin, Ill.; Engel, Louis, Jr., Buffalo, N. Y.; Faber, Wm. & Co., Oshkosh, Wis.; Fox, W. A., 249 3rd Ave. S., Minneapolis, Minn.; Gorham & Newport, Waukegan, Ill.; Hagmann & Hammerly, 1077 W. Harrison St., Chicago, Ill.; Hall Bros., 1613 Euclid Ave., Cleveland, O.; Hewitt, R. M., Lansing, Mich.; Hickman, Kraemer & Croll Co., 508 Merrill Bldg., Milwaukee, Wis.; Lette Shay, Harbor Springs, Mich.; Occident Motor Car Co., 2631 Pico St., Los Angeles, Cal.; Pacific Commercial Co., Tacoma, Wash.; Sauder & Co., J. M., Akron, O.; L. Smith, West Point, Ia.; Tucker, George R., Brattleboro, Vt.; E. D. Doan, Saginaw, Mich.

Motor Car Co. of N. J.—289-93 Halsey St., Newark, N. J. (Autocar, Cadillac, Packard.) Supplies, electric charging, repairing and garage. Inglis M. Upperco, Sec. and Treas.

Motor Car Heater Co.—21 Quincy St., Chicago, Ill. Mfrs. automobile heaters.

Motor Car Journal.—Pub. at 27 Charging Cross Rd., London, England.

Motor Car Livery.—1406 Chancellor St., Philadelphia, Pa. Garage.

Motor Car Magazine.—Pub. at 108 Fulton St., New York City.

Motor Car Maintenance Co.—247-249 W. 49th St., New York City. Garage and machine shop. Cap. \$10,000. Est. Oct. 25, 1907. T. J. Toner, Pres.; W. H. Webster, Sec.; Nicholas Betzman, Treas.

Motor Car Power Equipment Co.—Rear 577 Grove St., Milwaukee, Wis. Mfrs. gasoline marine motors.

Motor Car Racing Association.—Jas. G. B. Davy, Sec., 20 St. Paul St., Baltimore, Md.

Motor Car Repair Co.—38-40 W. 43d St., New York City. Repairing.

Motor Car Repair Co.—408 Orange St., Wilmington, Del. (Maxwell.)

Motor Car Specialty Co.—112 N. Broad St., Philadelphia, Pa. Mfrs. speedimeters and speed meters, gasoline filters. Mem. M. & A. M. E. S. Lea, Pres.; Jno. L. Kuser, Treas.; Wm. S. Jones, Selling Agent.

Motor Car Specialty Co.—147 E. State St., Trenton, N. J. Garage.

Motor Car World, The.—Pub. at 73 Dunlop St., Glasgow, England.

Motor Club of Detroit.—E. H. Broadwell, Sec., Detroit, Mich.

Motor Club of Harrisburg.—J. Sidney Sible, Sec., Harrisburg, Pa.

Motor Club of Wildwood.—H. L. Hamersley, Sec., Wildwood, N. J.

Motorcycle Equipment & Supply Co.—4 Lake St., Hammondsport, N. Y. Mfrs. motorcycles.

Motorcycle Illustrated, The.—Drexel

Bldg., Broad and Walls Sts., New York City. Published monthly by the Motorcycle Publishing Co., A. D. Brown, Business Mgr.; L. H. Cornish, Editor.

Motorcycle Specialty Co.—258 Columbus Ave., Boston, Mass. (Indian.) Combination Stand and Baggage Carrier, handle bars.

Motor Cycle, The.—Pub. at 20 Tudor St., London, England.

Motordrome Club.—Land Title Bldg., Philadelphia, Pa. Organized to promote automobile track racing on the 3-mile motordrome, land for which has been purchased and an incorporated company formed to construct, known as The American Motordrome, Inc.

Motorenfabrik Magnet.—Weissensee, Berlin, Germany. Mfrs. motorcycle motors, motorcycles. (Magnetos.) Gasoline automobiles. (Protos cars.)

Motor Engineering Co.—15 Verulam St., London, England. Mfrs. automobile motors.

Motor Equipment Co.—901 Pike St., Seattle, Wash. Est. October, 1906. Supply house handling automobile and launch accessories. E. J. Strelau, Pres., Treas. and Gen. Mgr.; Frank Atwood, Vice-Pres.

Motorfahrzeugfabrik Köln.—20 Marsiliusstrasse, Köln-Sülz, Germany. Mfrs. transmission gears, differential gears, gasoline automobiles.

Motorfahreubfabrik Heinle und Weiss.—Oberhausen-Augsberg, Germany. Mfrs. differential gears.

Motor Field.—Denver, Colo. Pub. monthly by G. A. Wahlgreen.

Motoring.—Stair Bldg., Toronto, Can. Pub. monthly by E. M. Wilcox. Official organ of the Ontario Motor League.

Motoring Illustrated.—Pub. at 11 Arundel St., Strand, London, England.

Motor Livery Co.—249 3d Ave., S., Minneapolis, Minn. (Dragon.)

Motor Mfg. Co., Ltd.—Coventry, England. Mfrs. automobile motors.

Motor News.—Pub. at Dublin, Ireland.

Motor News.—92 Griswold St., Detroit, Mich. Pub. monthly by the Motor News Pub. Co.

Motor Parts Co.—25 W. 42d St., New York City. Est. March 1, 1907. Supply house handling transmission gears, equalizing gears, gasoline motors, automobile lamps, horns, acetylene gas tanks and ignition apparatus.

Motor Print.—418-420 Sansom St., Philadelphia, Pa. Published monthly by The Motor Print Co. Warner H. Jenkins, Pres.; Arba M. Pennington, Sec.; Frank A. Egan and Arthur N. Jarvis, Editors; R. H. Smith, Advt. Mgr.

Motor Sales Co.—251 Jefferson Ave., Detroit, Mich. (De Luxe, Queen.)

Motor Sales Co.—1771 Broadway, New York City. (De Luxe.) Est. 1906. Cap. \$25,000. F. M. Keeton, S. J. Leonard, F. A. Rees, Officers; F. M. Keeton, Mgr.

Motor Shop.—317 N. Broad St., Philadelphia, Pa. (Stearns, Oldsmobile.)

Motor Specialty Mfg. Co.—105 Washington St., Chicago, Ill. Mfrs. electric lock switches.

Motor Top Co. of N. Y.—216 W. 50th St., New York City. Mfrs. storm aprons and curtains, wood and metallic bodies, glass wind shields.

Motor Tallyho Co.—Asbury Park, N. J. Garage.

Motor Tavern.—Cor. Main and Front Sts., Findlay, O. (Cadillac, Franklin.)

Motor Traction.—Pub. at London, England.

Motor Traction Co.—323 Delta Ave., Clarksdale, Miss. (Lambert.)

Motor Trader, The.—Pub. at 19 Wilson St., London, England.

Motor Transfer Co.—Richmond, Va. (Autocar, Buick, Matheson, Franklin, Cadillac.)

Motor Transportation Co.—565 Carroll Ave., Chicago, Ill. Repairing.

Motor Vehicle Co.—Mulberry and Crescent Sts., Harrisburg, Pa. (Atlas, Jackson, Cameron.)

Motor Vehicle Co.—518 Broad St., Newark, N. J. Garage.

Motor Vehicle Co.—1841 Market St., San Francisco, Cal. Garage.

Motor Vehicle Register, The.—227 S. 6th St., Philadelphia, Pa. Pub. monthly by J. B. Lippincott Co. for the Register Publishing Co.

Motor Vehicle Repair & Storage Co.—121 W. 81st St., New York City. Garage.

Motor Vehicle Repair & Storage Co.—121 W. 81st St., New York City. Garage.

Motorwagen, Der.—Pub. at 11 Kurfürstenstrasse, Berlin, Germany.

Motorwagenfabrik Excelsior Actiengesellschaft.—Zürich-Wollishofen, Switzerland. Mfrs. gasoline automobiles. (Excelsior cars.)

Motor Way.—Monadnock Bldg., Chicago, Ill. Pub. monthly by E. H. Baumgartner.

Motor West and California Motor.—1128 S. Main St., Los Angeles, Cal. Pub. monthly by the Motor West Publishing Co.

Motor World & Industrial Vehicle Review.—Pub. at 73 Dunlop St., Glasgow, England.

Motor World, The.—154 Nassau St., New York City. Pub. weekly by The Motor World Publishing Co. Joseph Goodman, Pres.; R. G. Betts, Treas.; F. W. Roche, Sec.

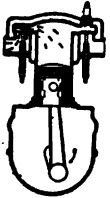
Motors.—Industrial motors may be classed, according to the mode of transmission of energy, as thermic, hydraulic

and electric. Of these the first in the present state of industry, are the most important of all, and comprise "internal combustion" (gasoline, benzine, etc.), "steam" and "hot-air" motors.

Motors, Internal Combustion.—These modern motors all operate with a preliminary compression of the gaseous mixture. From a theoretic point of view, they differ only by the fact that some require but two periods, that is to say, two strokes of the piston, to form a complete cycle (see Cycle), while others require four periods, that is to say, four strokes of the piston or two revolutions of the shaft.

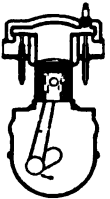
All the "four-cycle" internal combustion motors operate conformably to the following cycle:

First Period.—The first period is that of "suction." The piston being at the upper part of the cylinder, at the end of the stroke, is brought toward the bottom by the rotary motion of the fly-wheel, or fly-wheels (in the case of some upright motors.) In its downward stroke it forms a vacuum in the interior of



the cylinder and brings about the opening of the inlet-valve (if the latter is automatic), and permits of the introduction into the cylinder of a quantity of gas sensibly equal to the cylinder capacity. In case the valve is not automatic, but mechanically operated (like the exhaust-valve), it is opened at the proper time by a cam, which lifts its stem.

Second Period.—Reaching the lower part of the cylinder, the piston (continually actuated by the motion of the fly-wheel), begins its stroke towards the upper part of the motor, the suction-valve having closed as soon as the suction ceased. In this motion the piston compresses in the cylinder the gas that can no

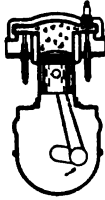


longer escape, and such compression tends to make the edges of the valves adhere more exactly to their seat.

This second period is that of "compression," the object of which is to condense the molecules of the gas and to raise its temperature. At the moment at which the piston reaches the end of its second stroke, an electric spark jumps in the explosion-chamber between the points of a spark-plug, and, bringing about an immediate ignition of the gas, causes a powerful expansion thereof (or "explosion" as it is commonly called).

Third Period.—Under the action of

such expansion, the piston is violently driven to the lower part on its "power-stroke," and thus effects the third movement of the cycle in the cylinder. This is the effective period—the period productive of work, the one that is to furnish the fly-wheel enough energy to suffice for the realization of the three others.



Fourth Period.—The piston has now reached the bottom of the cylinder, which remains full of burned gas. Continuing its stroke, and with so much more velocity in proportion as the expansion has been more violent, the piston actuated by the fly-wheel, which has just stored up new energy, ascends rapidly in the cylinder. At this moment a cam placed upon the half-time shaft of the motor lifts the stem of the exhaust-valve and



forces the latter to open for the entire period during which the piston is ascending and driving the burned gas before it. This is the "exhaust" or "scavenging" period, and the fourth and last movement in the cycle of operation.

In reality, the exhaust-valve begins to open, not at the beginning of the fourth period, but toward the end of the third. Experience has shown that it is not worth while to give a motor a slight advance to exhaustion in order to eliminate any compression prejudicial to the re-ascend of the piston. In a four-cycle motor as usually made the direction of rotation cannot be changed, except by changing the operation of the valves, since the exhaust-valve is opened on the down-stroke, when the direction is reversed and the burned gas would be drawn back from the muffler.

Owing to its simple construction and an impulse at every two strokes, or every revolution, the two-cycle motor has proved very attractive to a host of inventors and users, and a great number of designs have been produced. On motor-cars and motor-boats two systems of two-cycle motors are used, the two-port and the three-port. The first is provided with two ports in the cylinder and an inlet-valve in the crank-chamber or compression-chamber, through which the gas is admitted. The three-port, two-cycle motor has two ports in the cylinder above the piston, and another port in the cylinder below the piston, which is uncovered only on the upward stroke of the latter, and through which the gas enters the crank-chamber. The two-cycle motor operates as follows:

Starting with the piston at its upward position, a charge of gas is admitted to the crank-case. On the down-stroke the charge in the crank-case is compressed. When the piston nears the end of its down-stroke it uncovers a port in the cylinder-wall admitting the compressed charge from the crank-case through a passageway into the cylinder. The inlet-port is closed by the upward movement of the piston, and the charge is compressed thereby. Upon reaching the upward position the charge is fired and the expansion of the gas thus produced drives the piston out. Just previous to the uncovering of the inlet-port again, a port on the opposite side of the cylinder, called the exhaust-port, is uncovered, and the gas makes its escape through its own expansion. Thus each down-stroke of the piston compresses in the crank-case a charge that has been aspirated by the previous upward movement of the piston. Each cylinder of a two-cycle motor receives one power-impulse to every revolution of the crank-shaft.

A two-cycle motor will run in either direction, for the reason that the actions of admitting and exhausting the gases are relative in either direction. It may be reversed by switching off the spark until the speed of the motor decreases, and then advancing the spark and switching on the current again.

Motsenbockel, J. M.—Pres. Muncie Auto Parts Co., Elliott St. and L. E. & W. Yards, Muncie, Ind.

Motsinger Device Mfg. Co.—36 Main St., Pendleton, Ind. Mfrs. magnetos and ignition dynamos, mufflers. New York office, 29-31-33 W. 42d St.

Mott Wheel Works.—Pleasant St., Utica, N. Y. Mfrs. wire wheels.

Motte & Co., D.—25 rue de Courcelles, Levallois, France. Mfrs. motorcycles.

Motter, Chas. E.—York, Pa. (Stanley.)

Motz, Chas.—Pres. Motz Clincher Tire & Rubber Co., Akron, O.

Motz Clincher Tire & Rubber Co.—Akron, O. Mfrs. solid and cushion tires. Mem. M. & A. M. Cap. \$50,000. Est. 1904. Chas. Motz, Pres.; William Wolf, Vice-Pres.; Harry Williams, Sec. and Treas.

Mould.—The hollow space into which liquid metal is poured in order to produce a casting.

Moulton, E. H.—Pres. American Metal Polish Co., 89 Winslow Ave., W. Somerville, Mass.

Mound City Oil & Supply Co.—204 N. Commercial St., St. Louis, Mo. Jobbers lubricating oil and greases. Cap. \$10,000. Est. 1896. F. B. Filley, Pres.; F. H. Filley, Vice-Pres.; H. W. Strecker, Treas. and Mgr.

Mount & Bro., J. W.—Red Bank, N. J. Mfrs. bodies, tops, general repairing. (Autocar, Cadillac, Detroit.) Not inc. Est. 1860.

Moutoux, E.—Riverhead, Long Island, N. Y. (Maxwell.)

Movignante, Klubo, The.—Philadelphia, Pa.

Mowry, T. C.—Sec. and Treas. Baum's Castorine Co., 104 N. George St., Rome, N. Y.

Mowry, T. J.—Pres. Baum's Castorine Co., 104 N. George St., Rome, N. Y.

Mcyar, S. N.—Pres. Oil City Oil & Grease Co., Oil City, Pa.

Moyer, S. L.—Vice-Pres. The Lunkenheimer Co., Cincinnati, O.

Moyer, Walter.—Head Machine Shop, West Garage, cor Milton Ave. and Front St., Ballston, N. Y.

Mt. Clemens Garage Co.—16 Hew St., Mt. Clemens, Mich. Garage.

Mt. Diablo Garage.—Concord, Cal. (Rambler.) Est. 1907. Garage, 15 cars; repairing.

Mt. Morris Auto Garage.—27 W. 124th St., New York City. Garage.

Mt. Pleasant Auto Station.—Roxborough, Mass. Garage.

Mt. Vernon Automobile Co.—Prospect and N. 3d Aves., Mt. Vernon, N. Y. Garage.

Mt. Vernon Motor Co.—1118 Cathedral St., Baltimore, Md. (Autocar, Haynes, Panhard, Mercedes, Isotta.)

Mud-cock.—See Cock, Mud.

Mud-drum.—A receptacle on a steam-boiler for collecting the sediment deposited by the water.

Mud-guard.—A guard placed over the wheel of a vehicle in order to prevent mud from being splashed over the vehicle and its occupants. See Wing.

Mudd, Francis Xavier.—Gen. Mgr. Live Poultry Transportation Co. B. St. Mary's, Ky., July 21, 1861. Ed. St. Mary's College, Chafee's Business College. Director Live Poultry Transportation Co., McCuskey Electric Calculator Co., Mudd Mfg. Co., Chicago Binder & File Co. Mem. Chicago Athletic, Chicago A. C., South Shore Country, Chicago Motor, Traffic Club of Chicago. Res. 413 South Park Ave., Austin, Chicago. Office, 1210 Fisher Bldg., Chicago. Used first car (Stanley Steamer), 1900. Recreations, automobiling, fishing, hunting, photography.

Mueller, L. J.—6417 Woodland Ave., Cleveland, O. (Indian, Merkel.)

Muench, Wm. H.—Treas. The Lunkenheimer Co., Cincinnati, O.

Muffat, Albert.—35 rue du Stand, Geneva, Switzerland. Mfrs. pneumatic tires, leather tires.

Muffler.—A device, called also a "silencer" and "exhaust box," fitted to internal combustion-motors for deaden-

ing or silencing the noise made by the exhaust gases as they pass out at the end of the exhaust-stroke. It is not essential to the efficient working of the motor, and, if not properly designed, may create a back-pressure on the engine with a consequent diminution of power. A perfect muffler should deaden or silence all exhaust noises without setting

up any back-pressure whatever. This is effected by passing the exhaust-gases into a chamber or series of chambers of greater dimensions than those of the exhaust-pipe itself, and from the opposite end of which they make their exit into the atmosphere. It sometimes happens that a misfire occurs and the unburned gases pass from the cylinder into the muffler, in which case it is likely that the charge may become ignited by the heated exhaust-pipe and that an explosion will take place in the muffler. As a rule, however, no serious harm results from muffler explosions; but, if they occur within short intervals, the cause should be looked for and at once remedied. Many advocate the use of a "cut-out" on the exhaust-pipe before the muffler, so that when it is desired to see how the motor is working the exhaust can be turned directly into the atmosphere without passing through the muffler.

The accompanying figure shows a section of the Ossant muffler, which consists of a long galvanized iron cylinder containing several concentric chambers formed of cylinders that are likewise of iron-plate. In the center an inlet tube (which serves also as an outlet one) permits of the entrance of the gas into the muffler.

A vertical partition in the center divides the interior into two compartments. The arrows show the direction taken by the gas. This enters at the left through the central tube, which is connected, through a flange, with a tube starting from the exhaust and afterward passes into the first concentric chamber through an infinite number of small holes. Thence it passes into the second concentric chamber through a series of holes near the partition, and in the direction shown by the arrows, and then into the third chamber.

As the central partition of this external chamber is provided with apertures, the gas passes into the second compartment, and thence returns in the direction shown by the arrows and follows a path the reverse of the first in the central tube, which extends beyond the flanges, and finally makes its exit to the exterior.

It will be seen that the exhaust-gas has

a long trip to make before it escapes into the air, and that all the chambers that it has to traverse slacken its velocity and, at the same time, considerably reduce its temperature.

In the interior of the muffler, asbestos-paper is riveted against certain of the walls for the purpose of not only deadening the noise, but also for protecting the metal from the rapid oxidation caused by the temperature of the burned gas.

Muffler, Cooling.—One in which the gases are cooled either by an increased surface submitted to a draught of air, or by cooling with water.

Muffler, Cut-out.—See Cut-out and Muffler.

Muffler, Expanding.—A muffler in which the hot gases are allowed to expand to nearly the pressure of the atmosphere.

Muffler Explosions.—See Muffler.

Muffler, Separating.—A muffler in which the gases are broken up by flowing through a number of small apertures in tortuous passages.

Mulcahy, F. J.—Pres. The Eaton, Cole & Burnham Co., Bridgeport, Conn.

Mulford, D. L.—1801 N. 21st St., Philadelphia, Pa. Garage.

Mulhaupt, F. J.—227 N. 5th St., Lafayette, Ind. Repairing.

Mulkey, J. M.—Vice-Pres. Reliance Motor Car Co., 89 Fort St. E., Detroit, Mich.

Mullaney's Sons, James.—141 E. 25th St., New York City. Mfrs. brass pipe fittings.

Mullenhour Mfg. Co., F. W.—132 N. Union St., Lima, O. Repairing.

Muller, Albert.—205 W. 41st St., New York City. Mfrs. storage batteries.

Muller-Cahoon Co.—Salt Lake City, Utah. (Pope-Waverley.)

Muller, Jacob.—Treas. and head Trimming Dept., Buffalo Auto Body & Trimming Co., 338-340 Ellicott St., Buffalo, N. Y.

Muller et Cie., Roger.—108 Ave. Philippe-Auguste, Paris, France. Mfrs. lubricators.

Muller und Lohse.—Blumenstrasse 14, Leipzig-Gohlis, Germany. Mfrs. coils.

Mulliner, Ltd.—Northampton, England. Mfrs. bodies.

Mullins Co., W. H.—Salem, O. Mfrs. wood and metallic bodies, battery boxes, dashes and fenders, drip pans, hoods, tanks, motorboats.

Mullken, J. T.—Trappe, Md. (Cadillac.)

Mullock, H. J.—Gen. Mgr. Mullock's Belmont Garage, 13-15 South S. Carolina Ave., Atlantic City, N. J.

Mullock's Belmont Garage.—13 and 15 South S. Carolina Ave., Atlantic City, N. J. (Wayne, Rambler, Pullman.) Est.

1895. Not inc. H. J. Mulock, Gen. Mgr. Garage, 50 cars. Repairing.

Multi-cylinder Engine.—A reciprocating engine which has more than one cylinder.

Multiple, In.—If it be desired to connect storage-cells so that both the voltage and amperage shall be increased, the cells may be divided into two or more groups, with the same number of cells in each. The cells of each group are connected "in series" (see Series), and the free poles of the groups connected "in parallel" (see Paralel). This is termed connecting "in multiple." This method of connecting the cells for an ignition gives a uniform current and increases the life of the cells.

Multiplication.—In a transmission by gears or belts the ratio of the velocity of the driving to the driven shafts.

Munch, J.—18 rue Rottemburg. Paris, France. Mfr. marine motors.

Münchener Verein für Luftschiffahrt.—Muncheu, Germany. (Munich Aero Club.)

Muncie Auto Parts Co.—Muncie, Ind. Elliott St. and L. E. & W. Yards. Mfrs. transmission and steering gears, universal joints, steering wheels, clutches, levers, machine work. Mem. M. & A. M. Cap. \$50,000. Est. Oct., 1905. J. M. Motzenbocker, Pres.; Chas. B. Fudge, Vice-Pres.; H. L. Hooke, Sec. and Treas.; Geo. H. Guthrie, Supt.; Wm. Schmid, Gen. Foreman; A. W. Tyler, Jr., Chief Draughtsman and Inspector.

Muncie Auto Parts Co.—210 N. Walnut St., Muncie, Ind. Garage.

Muncie Garage & Repair Co.—209 E. Adams St., Muncie, Ind. Garage.

Muncie Gear Works.—801 E. Charles St., Muncie, Ind. Mfrs. differential gears.

Mundt & Sons, Chas.—441 Pearl St., New York City. Mfrs. perforated metals.

Mundy, H. H.—Treas. Utica Motor Car Co., 333 Bleecker St., Utica, N. Y.

Muneaux, Ed.—7 rue Marivaux, Paris, France. Mfrs. springs.

Munroe, John B.—Powellton, Ill. (Waltham.)

Munsell & Co., Engine.—218 Water St., New York City. Mfrs. eye shields, mica.

Munson Belt Co., Chas.—88 Franklin St. Chicago, Ill. Mfrs. rawhide gear wheels.

Munson, C. Larue.—Pres. E. Keeler Co., 3d and W. Sts., Williamsport, Pa.

Murden, Herbert.—Supt. Haynes Automobile Co., Main St., Kokomo, Ind.

Murdock Bros.—Oneonta, N. Y. (Maxwell.)

Murdock Co., James, Jr.—116 Opera Pl., Cincinnati, O. Mfrs. license numbers, monograms, steel stamps and stencils, metal trimmings.

Murdock-Shaw Co.—125 Federal St., Boston, Mass. Mfrs. name plates.

Murillo Mfg. Co.—Marion, Ind. Garage.

Murphy, A. H.—918 State St., Erie, Pa. (Pope-Toledo, Rauch & Lang, Elmore.)

Murphy & Cooley.—Hartford City, Ind. (National.)

Murphy Bros.—Erie, Pa. (Thomas Flyer, Franklin, Winton.)

Murphy Co., G. W. J.—Merrimac, Mass. Mfrs. bow separators, curtain fasteners, top fixtures, metal trimmings.

Murphy, Franklin.—Pres. Murphy Varnish Co., Newark, N. J.

Murphy, Franklin, Jr.—Vice-Pres. Murphy Varnish Co., Newark, N. J.

Murphy, Irving A.—Head of Purch. Dept., Gerson-Carey, Kalamazoo St., L. S. & M. S. R. R., Lansing, Mich.

Murphy & Co., Thos. J.—119 S. Parsons Ave., Columbus, O. Vulcanizing.

Murphy Varnish Co.—Newark, N. J. Mfrs. varnish, colors. Cap. \$2,000,000. Est. 1866. Franklin Murphy, Pres.; Franklin Murphy, Jr., Vice-Pres.; A. B. Garner, 2d Vice-Pres. and Treas.; Clarence H. Bissell, Gen. Supt.; John J. Nicholson, Gen. Sales Mgr.

Murphy, W. F.—Sales Mgr. Martini Import Co., 239 W. 50th St., New York City.

Murphy, Wm. H.—Treas. Cadillac Motor Car Co., 1343 Cass Ave., Detroit, Mich.

Murray & Tregurtha Co.—340 W. 1st St., Boston, Mass. Mfrs. gasoline marine motors, motorboats.

Murray Hill Garage.—32 E. 40th St., New York City. (Second-hand cars.)

Murray, Jas. E.—Sec. and Treas. New York Sporting Goods Co., 17 Warren St., New York City.

Murray, J. L.—215 S. Main St., Bloomington, Ill. (Cadillac.)

Murray, T. S.—Chester, N. Y. (Maxwell.)

Murray, Wm.—Vice-Pres. and head of Mfg. Dept., Chase, Roberts & Co., West Ave. and 5th St., Long Island City, N. Y.

Murrey & Murrey.—113 Allegan St., E. Lansing, Mich. Mfrs. tanks.

Murrey Hill Auto Station.—27 E. 35th St., New York City. Garage.

Murrey, W. B.—1253 Milwaukee Ave., Chicago, Ill. Mfrs. gasoline automobile motors.

Murrey, W. F.—28 Beach St., Boston, Mass. Mfrs. spark coil boxes, pattern-makers.

Mushroom.—The same as "spray-cone," q. v. (2) Another name for poppet-valve. (3) A name for a variety of tire-bolt. (4) A mushroom anchor.

Muskegon Bicycle & Auto Co.—18-20 Clay Ave., Muskegon, Mich. (Rambler, Maxwell.)

Musker, C. & A.—Tunbrook, Liver-

pool, England. Mfrs. steam commercial automobiles. (Musker trucks.)

Musliner & Co., Jos.—156 Maiden Lane, New York City. Mfrs. oils, semi-solid oils.

Musselman, C. A.—Sec. and Treas. Cycle & Automobile Trade Journal, 1213 Filbert St., Philadelphia, Pa.

Mutel et Cie.—124 rue St. Charles, Paris, France. Mfrs. marine and automobile motors.

Mutty Co., L. J.—28 Summer St., Boston, Mass. Mfrs. automobile covers, artificial leather, rubber cloth, cloth and carpet trimmings.

Mutual Auto Accessories Co., The.—1937 Broadway, New York City. Mfrs. tire cement, eye shields, horns, hydrometers, jacks, automobile body soaps, hand soaps.

Mutual Electric Co.—Kokomo, Ind. (Haynes, Pope-Waverley.)

Mutual Elec. Co.—Duluth, Minn. (Pope-Toledo.)

Mutual Supply Co.—2210 Farnam St., Omaha, Neb. (Monarch.)

Mutual Machine Co., The.—25 Wells St., Hartford, Conn. Mfrs. universal

joints and all kinds of gear cuttings. Cap. \$12,000. Est. 1901. Inc. 1907. H. C. Warren, Pres. and Treas.; E. R. Faxon, Sec.

Myers, A. J.—Mgr. Pneumatic L'Electric Co., 1591 Broadway, New York City.

Myers, Angelo.—Pres. Rose Mfg. Co., 910 Arch St., Philadelphia, Pa.

Myers & Co., C. F.—126 6th St., Logansport, Ind. (Garage.)

Myers, Fred, Sr.—Redfield, S. Dak. (Cadillac.)

Myers, J. B.—Supt. Maxwell-Briscoe Motor Co., Tarrytown, N. Y.

Myers, M. L.—2nd Asst. Treas. Dragon Motor Co., 31st, 32nd and Chestnut Sts., Philadelphia, Pa.

Myers, M. R.—Sec. Albaugh Bros., Dover & Co., Marshall Blvd. and 21st St., Chicago, Ill.

Myers, S. C.—513 16th St., Oakland, Cal. Garage.

Myers, T. P.—Adv. Mgr. Rapid Motor Vehicle Co., Rapid St., Pontiac, Mich.

Myers, William B.—Sec. E. J. Willis Co., 8 Park Pl., New York City.

Myronda Motor Car Co.—St. Louis, Mo. (Knox.)

N

n.—A Symbol for "frequency."
N.—Symbol for "north," or for the north-seeking pole of a magnet.

N.—Symbol for the "magnetic flux."

n. h. p.—An abbreviation of "nominal horse-power."

Ni.—Symbol for "Nickel."

Nacke, E.—Koetitz bei Coswig, Saxony, Germany. Mfr. gasolene automobiles, gasolene commercial automobiles and tricars (Nacke).

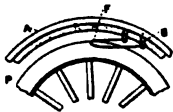
Nadig & Bros. Mfg. Co., C. H.—16-24 N. 4th St., Allentown, Pa. Mfrs. steam engines. (Waltham.)

Nading, M. M.—Pres. Flatrock Automobile Co., Flatrock, Ind.

Nado, Lewis A.—Danielson, Conn. (Rambler.)

Nagant Frères.—44 quai de Coronmeuse, Léige, Belgium. Mfrs. gasolene automobiles, gasolene commercial automobiles (Nagant), differential gears, transmission gears, automobile motors, marine motors.

Nail-puller.—A device, called also a "nail catcher," for automatically drawing nails or the like from the tire of an automobile before they have a chance to puncture the inner tube. It consists (see figure)



of a stout wire, F, chain or openwork iron plate hung at two points, B, from the fender, A, and the surface of which nearly grazes the tread, P, of the tire.

Nalle, Ewell.—601-623 E. 6th St., Austin, Tex. (Thomas, Buick.) Est. 1902. Repairing cars represented only.

Naphtha.—A term originally applied to rock oil, that is, oil issuing from the earth. As a trade term, it is employed by oil refiners to designate a series of products obtained in the manufacture of kerosene, or what is obtained in the distillation process after all the benzine is given off and kerosene is obtained. There are three grades of naphtha known to the trade, viz., "A naphtha," "B naphtha," and "C naphtha," of which the latter is the lightest. To the consumer these products are usually known as "gasolene." The first (A naphtha) of a specific gravity of .68 to .70, is the usual internal-combustion motor fuel and fuel for gasolene stoves, and the burners of steam-cars. See Gasolene.

Naphtha-engine.—A motor-boat single-acting engine provided with a coil boiler in which is used a mixture of naphtha and water, and which is heated by naphtha.

Naphtha-launch.—See Launch, Naphtha.

Naphthalene.—A hydrocarbon ($C_{10}H_8$), called also by the trade-name of "carbon," and formed in large quantities as a by-product in the preparation of coal-gas. When the last portion of the volatile oily product passes over in the distillation of coal-tar it is collected and allowed to stand, whereupon a quantity of solid crystalline matter, which is principally naphthalene, separates. By sublimation, it is obtained perfectly white, and is the common ingredient in what are commonly called "camphor balls," or "moth balls." It melts at $176^{\circ} F.$ ($80^{\circ} C.$) and boils at $414^{\circ} F.$ ($212^{\circ} C.$), and, when vaporized, may be used as a fuel in internal combustion-motors. See Motor, Naphthalene.

Naphthalene Motor.—See Motor, Naphthalene.

Napier., Geo. R.—Macon, Ga. (Maxwell.)

Napier Motor Car Co. of America.—Jamaica Plain, Mass. Mfrs. gasolene automobiles. (Napier cars.)

Napier Motor Co.—Acton Vale, London, England. Mfrs. gasolene automobiles (Napier cars), marine motors.

Naris-Chiorda.—Via Umberto primo, Albino, Italy. Mfrs. motorcycles.

Nash & Bartlett.—Flatiron Bldg., New York City. U. S. Distributors for Commonwealth Rubber Co., except New England, Pennsylvania, Indiana and Michigan.

Nash & Co., Geo.—224 Pearl St., New York City. Mfrs. steel.

Nash, J. H.—Orono, Me. (Ford.)

Nash, W. B.—Machais, Me. (Waltham.)

Nashville Motor Car Co.—Cor. Church St. and Ninth Ave., Nashville, Tenn. (Dorris, Stanley.) Est. May 1, 1903, under name of Duncan R. Dorris, as Nashville Motor Car Co., June 15, 1905. Inc. Jan. 1, 1907. Cap. \$10,000. Dr. Chas. Brower, Pres.; M. S. Pilcher, Vice-Pres.; D. R. Dorris, Sec.; Treas. and Sales Mgr.; R. L. Fletcher, Garage Mgr. Garage, 50 cars. Repairing.

Nathan Novelty Mfg. Co.—88 Reade St., New York City. Mfrs. storm curtains and aprons, lamp covers, tire cases, auto covers, rubber aprons, tool cases and inner tube cases.

National Acme Mfg. Co., The.—Cor, Stanton Ave. S. E. and E. 75th St., Cleveland, O. Mfrs. automatic screw machines, cap and set screws and special milled goods. Cap. \$1,250,000. Est. 1902. W. B. D. Alexander, Pres.; E. C. Henn, Vice-Pres. and Supt.; A. W. Henn, Sec.; O. S. Wernitz, Treas.

National Association of Automobile Manufacturers, Inc.—7 E. 42nd St., New York City. The N. A. A. M., Inc., is the successor to the National Association of Automobile Manufacturers, organized in 1901, of which S. T. Davis, Jr., was the first president and M. J. Budlong second president. The present N. A. A. M. was incorporated April 5, 1904, the object being the "general improvement of trade conditions and protection of trade interests." Its charter members were (active) Apperson Bros. Auto Co., Autocar Co., Baker Motor Vehicle Co., Berg Automobile Co., Cadillac Automobile Co., Consolidated Motor Co., Duryea Power Co., Electric Vehicle Co., Elmore Mfg. Co., Ford Motor Co., H. H. Franklin Mfg. Co., Grout Bros. Auto Co., Holley Motor Co., Thos. B. Jeffery & Co., Kirk Mfg. Co., Knox Auto Co., Locomobile Co. of America, Matheson Motor Car Co., Ltd., Mobile Co. of America, National Motor Vehicle Co., National Sewing Machine Co., Olds Motor Works, Packard Motor Car Co., Peerless Motor Car Co., Geo. N. Pierce Co., Pope Mfg. Co., Royal Motor Car Co., Smith & Mabley Mfg. Co., Standard Motor Construction Co., F. B. Stearns Co., Stearns Steam Carriage Co., St. Louis Motor Carriage Co., J. Stevens Arms & Tool Co., Studebaker Bros. Mfg. Co., E. R. Thomas Motor Co., Vehicle Equipment Co., Waltham Mfg. Co., White Sewing Machine Co., Winton Motor Carriage Co., Woods Motor Vehicle Co.; (associate) American Automobile Storage Co., American Coil Co., The Automobile, The Auto Supply Co., Badger Brass Mfg. Co., Baldwin Chain & Mfg. Co., Brown-Lipe Gear Co., Columbia Lubricants Co. of New York, Cycle & Automobile Trade Journal, Dayton Electrical Mfr. Co., R. E. Dietz Co., Dow Portable Electric Co., The Electric Storage Battery Co., Federal Mfg. Co., Fisk Rubber Co., Peter Forg, A. H. Funke, Gleason-Peters Air Pump Co., The Garvin Machine Co., Gray & Davis, Good-year Tire & Rubber Co., G. & J. Tire Co., Hartford Rubber Works Co., Hyatt Roller Bearing Co., Phineas Jones & Co., Locke Regulator Co., McCanna Dash Co., Mason Regulator Co., Midgley Mfg. Co., Motsinger Device Mfg. Co., National

Carbon Co., Newport Engineering Works, New Process Rawhide Co., N. Y. Edison Co., K. Franklin Peterson, Sartus Ball Bearing Co., Steam Carriage Boiler Co., Ralph Temple & Austrian Co., Veeder Mfg. Co., Weston Electrical Instrument Co., The Whitlock Coil Pipe Co., Whitney Mfg. Co.,

The present active membership consists of the following: American Locomotive Auto Co., Apperson Bros. Auto Co., Autocar Co., Babcock Electric Carriage Co., Baker Motor Vehicle Co., Beverley Mfg. Co., The Bartholomew Co., Buick Motor Car Co., Cadillac Motor Car Co., Commercial Motor Co., Corbin Motor Vehicle Corp., Daimler Mfg. Co., Dayton Motor Car Co., Electric Vehicle Co., Elmore Mfg. Co., Ford Motor Co., H. H. Franklin Mfg. Co., The Garford Co., Grout Bros. Auto Co., Haynes Automobile Co., Hewitt Motor Co., Thos. B. Jeffery & Co., Knox Automobile Co., Locomobile Co. of America, Matheson Motor Car Co., Maxwell-Briscoe Motor Co., Mitchell Motor Co., Lozier Motor Co., National Motor Vehicle Co., Northern Motor Mfg. Co., Olds Motor Works, Packard Motor Car Co., Peerless Motor Car Co., Geo. N. Pierce Co., Pope Mfg. Co., Pope Motor Car Co., Premier Motor Mfg. Co., Royal Motor Car Co., Reliance Motor Car Co., F. B. Stearns Co., St. Louis Motor Carriage Co., Stevens-Duryea Co., Studebaker Bros. Mfg. Co., E. R. Thomas Motor Co., Reo Motor Car Co., Waltham Mfg. Co., Wayne Auto Co., The White Co., Winton Motor Carriage Co., Woods Motor Vehicle Co.

Present officers: A. L. Pope, Pres.; S. D. Waldon, Vice-Pres.; Thos. Henderson, 2nd Vice-Pres.; Wm. E. Metzger, 3rd Vice-Pres.; L. H. Kittridge, Sec.; W. R. Innis, Treas.; Samuel A. Miles, Gen. Mgr.; Chas. Thaddeus Terry, Counsel. The Executive Committee consists of S. T. Davis, Jr., Windsor T. White, Charles Clifton, Thomas Henderson, Wm. E. Metzger, S. D. Waldon, Wm. R. Innis, C. C. Hildebrand, M. J. Budlong, E. H. Cutler, Albert L. Pope, Benj. Briscoe, L. H. Kittridge, Ezra E. Kirk, Wm. Mitchell Lewis. The chairmen of committees are S. D. Waldon (Contest and Good Roads), Thomas Henderson (Legislative), S. T. Davis, Jr. (Membership), M. J. Budlong (Show), W. T. White (Transportation), C. C. Hildebrand (Auditing).

National Association of Engine and Boat Manufacturers.—314 Madison Ave., New York City. John J. Amory, Pres.; James Craig, Treas.; Hugh S. Gambel, Sec.; H. R. Sutphen, 1st Vice-Pres.; W. J. Reynolds, 2nd Vice-Pres.; J. M. Truscott, 3rd Vice-Pres.

National Auto & Supply Co.—Cor.

Duke and Vail Sts., Lancaster, Pa. (Rambler, Crawford, Marmon.)

National Auto Co.—New Orleans, La. (Monarch.)

National Auto Co.—1711 14th St., Washington, D. C. (Oldsmobile, Studebaker.)

National Auto Co., Inc.—957 S. Main St., Los Angeles, Cal. (National, Triumph, F. N. Motorcycles.) Est. 1901. Cap. \$25,000, paid up. Llewellyn H. Johnson, Pres.; Wm. E. Ramsay, Treas.; Frederick H. Taft, Sec.; Geo. S. Maslen, Head of Sales Department; A. E. Brown, Head of Mechanics Department; P. H. Rice, Jr., Head of Demonstration.

National Automobile Top Co.—Main Office, 1904 Broadway. Factory, 244-50 W. 49th St., New York City. Mfrs., jobbers and dealers. Mfrs. automobile tops, glass fronts, folding wind shields, slip covers, dust hoods, automobile top repairing. Est. Jan. 1, 1907. John J. Bush and Andrew Herman, Partners. G. A. Mackey, Factory Mgr.; G. L. Wilson, Asst. Factory Mgr.; T. F. Kelly, Traveling Salesman. General Eastern agents for the Sprague Umbrella Co. and the Blasler Mfg. Co.

National Battery Co.—368-382 Massachusetts Ave., Buffalo, N. Y. Mfrs. ignition and electric vehicle storage batteries. Mem. M. & A. M. Cap. \$1,000,000. Est. 1900. J. R. Richmond, Pres.; R. L. Coleman, Chairman of Board; Ralph Kimberly, Sec. and Treas.

National Brake & Clutch Co.—16 State St., Boston, Mass. Owners and Licensors of Patents covering the use of "Cork Inserts" or segments in brakes, clutches, pulleys and frictional devices. William W. Whitcomb, Pres.; Lawrence Whitcomb, Secv., Treas. and Gen. Mgr. Agents: Standard Brake Co., 101 W. 66th St., New York.

National Brake & Electric Co.—Milwaukee, Wis. Mfrs. clutches.

National Capital Automobile Club.—E. W. Sutherland, Sec., 819 14th St., N. W., Washington, D. C.

National Carbon Co.—Lock Drawer L., Cleveland, O. Mfrs. dry cells, ignition batteries of all kinds and testing instruments. Cap. \$10,000,000. Mem. M. & A. M.

National Casket Co.—New York City, Boston, Philadelphia, Baltimore, Pittsburgh, Nashville, Louisville, Indianapolis, Rochester, Buffalo, Albany and Chicago. Mfrs. lap robes, rain coats and auto heaters. C. Will Chappell, Pres., Oneida, N. Y.; Leo Stein, Vice-Pres., Hoboken, N. J.; J. T. Richards, Vice-Pres., Chicago, Ill.

National Cement and Rubber Mfg. Co. 3053-59 Monroe St., Toledo, O. Mfrs. rubber cement, friction tape, automobile graphites and greases, metal polish, auto-

mobile repair kits, brazing forges. Cap. \$50,000. Est. 1897. D. V. R. Manley, Pres. and Gen. Mgr.; W. F. Gifford, Sec. and Treas.

National Coil Co.—Lansing, Mich. Mfrs. spark coils, electric switches.

National Construction Co.—604 Morgan Bldg., Buffalo, N. Y. Mfrs. portable houses.

National Corundum Wheel Co.—455 Ellicott St., Buffalo, N. Y. Mfrs. emery wheels.

National Cutlery Co.—Detroit, Mich. Mfrs. machinery springs.

National Cycle Mfg. Co.—Bay City, Mich. Mfrs. ball cups, machine work to order, oil pumps, screw machine products and screws.

National Elastic Nut Co.—Milwaukee, Wis. Mfrs. lock nuts and washers.

National Equipment Co.—Holland Bldg., St. Louis, Mo. Mfrs. gasolene and kerosene burners.

National Garage.—Cor. 7th and Main Sts., Los Angeles, Cal. Garage.

National India Rubber Co.—Bristol, R. I. Mfrs. storm aprons and curtains, collapsible buckets, inner tire tubes, tire tools, tire tape, cloth and carpet trimmings, insulated wire.

National Lock Washer Co.—65-89 Johnson St., Newark, N. J. Mfrs. lock nuts and washers, washers.

National Motor Car Co.—Oakland, Cal. (Chadwick, Jackson, National and Queen.)

National Motor Vehicle Co.—Cleveland, O. Garage.

National Motor Vehicle Co.—E. 22nd St. and Monon R. R., Indianapolis, Ind. Makers of the National car; first marketed in 1900. Fifteen different models made since: eight electric and seven gasoline. Cap. \$250,000. Chas. E. Test, Pres.; P. E. Manchester, Vice-Pres.; A. C. Newby, Sec., Treas. and Gen. Mgr.; W. G. Wall, Designer; Harry Moore, Supt.; Geo. H. Matheson, Purch. Agt.; Geo. M. Dickson, Sales and Advt. Mgr.; William F. Striebe, Ass't. Supt.

National Oil & Supply Co.—Newark, N. J. Mfrs. grease, transmission gear compound and oil.

National Oil Burner & Equipment Co.—Holland Bldg., St. Louis, Mo. Mfrs. condensers.

National Oil Pump & Tank Co.—Dayton, O., and 120 Liberty St., New York City. Mfrs. oil pumps, tanks and storage tanks.

National Pipe Bending Co.—River and Lloyd Sts., New Haven Conn. Mfrs. coils and bends of iron, and brass and copper pipes.

National Porcelain Co.—Trenton, N. J. Mfrs. porcelain.

National Professional Chauffeurs' Club, No. 1.—1947 Broadway, Rooms 305-6,

Arcade Bldg., and 23 Park Row, Rooms 55-56, New York City. Organized January, 1905, by Frank Gorman. Daniel Honeker, Pres.; P. J. O'Haire, Vice-Pres.; Betram Hope, Fin. Sec.; A. J. Taranto, Rec. and Cor. Sec.; Chas. Durbin and David Watkins, Trustees; A. Bilander, Treas. Charter members: Jas. O'Connell, Geo. Taylor, Frank Gorman, Betram Hope, Fred Brown, A. J. Taranto, D. J. Martyn, Chas. Durbin, F. W. Schaffner, Sidney Richman, Harry Humphries, Chas. Jager, Chas. Wannemacker, Daniel Honeker, Jos. Price, Wm. Kerrigan, P. J. O'Haire, Herbert Walsh, Albert Kupcsik, E. Nassoy, C. Coon, L. Stockhammer, Wm. Meyers, J. B. Wilson, B. Ericson, Gus. Lechleitner, H. Clayton, T. Donovan, Thos. Hyland, Chas. Doughty, E. Heynemann, Wm. Kurts. Present Chairmen of Committees: Gus Lechleitner, Wm. Kurts, Chas. Durbin, D. J. Martyn, Frank Gorman, P. J. O'Haire, Fred Brown, Thos. Hyland and Chas. Doughty. Former Presidents: Geo. Taylor and Alden Markham. National Headquarters, McGill Building, Washington, D. C., Rooms 402-7. National President, Jas. O'Connell.

National Sales Corporation.—296 Broadway, New York City. Importers and distributors, supplies.

National Screw & Tack Co.—Cleveland, O. Mfrs. bolts, nuts and screws.

National Sewing Machine Co.—Belvidere, Ill. Mfrs. bolts, nuts, lubricators, screws and washers.

National Spring & Wire Co.—Albion, Mich. Mfrs. spring edge cushions, frames and cushion springs for automobiles and carriages. Cap. \$10,000. Est. October, 1902. A. J. Abbott, Pres.; S. M. Raferty, Vice-Pres. and Traveling Salesman; Elmer Jacobs, Gen. Mgr. and Treas.; O. A. Leonard, Sec.; F. B. King, Supt.

National Supply Co.—Philadelphia, Pa. (Waltham.)

National Surety Co.—346 Broadway, New York City. Issue powers of attorney, acceptable as bail, when arrested for violation of automobile laws in the following States: California, Connecticut, District of Columbia, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont and Wisconsin.

National Tube Co.—McKeesport, Pa. Mfrs. steel tubing.

National Wheel Co.—Jackson, Mich. Mfrs. artillery wheels. Cap. \$50,000. Est. 1890. Henry H. Smith, Pres.; Thos. E. Barkeworth, Vice-Pres.; James R. Mercer, Sec., Treas. and Mgr.

Natural Magnet.—See Magnet

Naugatuck Malleable Iron Co.—Naugatuck, Conn. Mfrs. carburetter ball floats and malleable iron castings.

Nautical Mile.—See Mile. Nautical.

Nave.—The central part of a wheel, called also "hub" and "boss."

Navigation Aérienne Société Française, de.—10 rue de la Pépinière, Paris, France

Neal, Clark & Neal Co.—643 Main St., Buffalo, N. Y. (Indian, Reliance.)

Nazarro, Felice.—Born Dec. 4, 1881, in Turin, Italy.



Worked as mechanic in 1897 for Ceirano, the Turin automobile dealer. Joined the Fiat Co. in 1900 as tester. Chauffeur of Vincenzo Florio in 1905. Piloted Florio's 75-hp. Panhard, Paris-Madrid (1903). Joined the Fiat

racing team in 1905, and this same year was second in the Bennett Cup race, first in Mount Cenis hill climb, sixth in Brescia and sixth in the Vanderbilt race. In 1907 won the Targa Florio (Italy), the Kaiser's Prize (Germany), the Grand Priz (France). Finished every race in which he drove.

Neal, Thomas.—Sec. and Gen. Mgr. Acme White Lead & Color Works, Detroit, Mich.

Neare, C. J.—Sec. and Treas. Sid Black Automobile Co., 630 Walnut St., Cincinnati, O.

Neck.—A general name for a narrow portion of some object, particularly the journal of a shaft.

Neckarsulmer Fahrradwerke Actiengesellschaft.—Neckarsulm, Würtemberg, Germany. Mfrs. N. S. U. motorcycles and U. S. U. tricar, automobile and motorcycle motors.

Needle.—A straight wire balanced and pivoted, as in a compass; the magnetic needle.

Needle-valve.—See Valve, Needle.

Neelémans, A., et Tardieu.—25 rue d'Edinbourg, Brussels, Belgium. Mfrs. elastic wheels.

Neely, Edward.—244 Wells St., Chicago, Ill. Mfr. lubricators.

Neely, N. A.—Christ Church, New Zealand. (Wayne.)

Neer Air Cooled Engine Co.—plain City, O. Mfrs. motors. Cap. \$25,000. Est. Jan. 1907. E. Beach, Pres.; H. Neer, Vice-Pres.; J. W. Price, Sec. and Treas. Directors: Beach, Neer, Price, M. Mackin and E. Fiedler.

Neer, H.—Vice-Pres. and Director Neer Air Cooled Engine Co., Plain City, O.

Negative.—A term used in expressing the direction in which the electric current is supposed to flow; the opposite of the positive.

Negative Stress.—A tension or tensile stress.

Negley, Charles.—Farmington, Ill. (Buick.)

Nehrbas, Frederick Philip.—B. Winchester, Erie, Co., N. Y., Dec. 22, 1876. Ed. Public school and private mechanical school conducted by Wm. Davy, M. E., then M. E. of Snow Steam Pump Co. Res. 362 Bird Ave., Buffalo, N. Y. In the trade since July 16, 1898. Used first car (Thomas) 1901.



With E. R. Thomas Co., Designing Dept., for four years. Asst. Gen. Supt. until 1908. Recreations, touring, hunting.

Neider Co., Inc., The F. A.—Augusta, Ky. Mfrs. curtain fasteners, knobs and clinch buttons and general line of metal top trimmings. Cap. \$100,000. Est. 1881. A. Freschl, Pres.; F. A. Neider, Vice-Pres.; Isaac Reynolds, Sec., Treas. and Mgr.

Neider, F. A.—Vice-Pres. The F. A. Neider Co., Inc., Augusta, Ky.

Neiderrheinischer Verein für Luftschiffahrt.—(Barmen Aero Club), Barmen, Germany.

Neiheisel Bros.—Boulder, Colo. (White, Smith, Autocar, Franklin, Jackson, Ford)

Neil, Perry L.—Pres. Quaker City Automobile Co., 138-46 N. Broad St., Philadelphia, Pa.

Neilsen Motor Car Co.—Detroit, Mich. Mfrs. gasoline automobiles and commercial vehicles.

Nelms, Robert.—42 W. Adams St., Jacksonville, Fla. (Queen)

Nelson & Co., J. A.—Round Rock, Tex. (Mitchell.)

Nelson Automobile Co.—216 Main St., Springfield, Mass. (Buick.)

Nelson, Axel.—8th St., bet. Orange and Lemon Sts., Riverside, Cal. Garage.

Nelson, E. R.—Ishpeming, Mich. (Franklin.)

Nelson House Garage.—34 Market St., Poughkeepsie, N. Y. (Maxwell.)

Nelson, H. P.—Sec. Pittman & Nelson Automobile Co., 2036 Addison St., Berkeley, Cal.

Nelson, Palen.—Vice-Pres. N. Y. Sporting Goods Co., 17 Warren St., and

Pres. Sports, Ltd., 2049 Broadway, New York City.

Nelson, S.—12 Park St., Jersey City, N. J. (Compound.)

Nelson W. H.—Smith Center, Kan. (Waltham.)

Neracher, Carl A.—Chief Engineer The Garford Co. B. Cleveland, O., Jan. 6, 1882. Res. 199 Meirose St., Cleveland, O. Office The Garford Co., Elyria, O.

Néron (Société de l'Antiderapant).—38 ter rue de Paris, Elbeuf, France. Mfrs. non-skids.

Ness, T. W.—Gen. Mgr. Holtzer-Cabot Electric Co., Brookline, Mass.

Nesseldorfer Wagenbau Fabrics Gesellschaft Semmering.—Vienna, Austria. Mfrs. gasoline commercial and gasoline automobiles. (Omnibus.)

Nest-gear.—See Gear, Nest.

Nestle, Otto G.—Sec. Daimler Mfg. Co., 939 Steinway Ave., Long Island City, N. Y.

Net, Balloon.—A network of cordage which incloses the gas-bag and supports the car through the intermedium of the suspension hoop. The size of the meshes varies with the cubage, and continues increasing from the upper pole to the equatorial region. Below it gives rise to cordage in which the ramifications increase in size but diminish in number and end in isolated suspension ropes furnished with loops. The net covers the entire upper hemisphere of the balloon. It relieves the bag in great part of the effort exerted upon it by internal pressure.

Nettleton & Co., V. L.—49 Chicago St. Garage, 21 Hanchett St., Coldwater, Mich. (Rambler, Maxwell.) Est. in auto line, 1903. Original hardware business was started by D. Nettleton in 1866. Garage, 12 cars; repairing.

Nettleton, R. B.—Head of Sales Dept. of Bird-Sykes Co., 1470 Michigan Ave., Chicago, Ill.

Neubauer, A. C.—Part owner and proprietor Palais de l'Automobile, 1778 Broadway, New York City.

Neubauer, H.—Part owner and proprietor Palais de l'Automobile, 1778 Broadway, New York City.

Neubling, John G.—8843 Penn Ave., Reading, Pa. (Indian.)

Neue Automobile Gesellschaft.—31 Luisenstrasse, Berlin, Germany. Mfrs. gasoline and gasoline commercial automobiles. (N. A. G. cars.)

Neue Gas Industrie.—Ulm, Germany. Mfrs. radiators

Neue Industriewerke.—Ulm-am-Don, Germany. Mfrs. horns.

Neue-Vergassergesellschaft.—63 Urbanstrasse, Berlin, Germany. Mfrs. carbureters.

Neuman & Co., Wm. F. V.—736 Woodward Ave., Detroit, Mich. (Wayne-

Pope-Waverley, Welch, White, Soules, Baker, Stoddard-Dayton.)

Neuman, J. E.—1841 Market St., San Francisco, Cal. (Rapid.)

Neumeister, Fred P.—Rockford, Ill. Mfr. automobile tops.

Neustadt Automobile & Supply Co.—3948-3950 Olive St., St. Louis, Mo. Mfrs. dealer and jobber of axles, wheels, bodies, woods, radiators and supplies. Cap. \$35,000. Est. 1901. J. H. Neustadt, Pres., Treas. and Executive; L. J. Neustadt, Sec.; Chas. Neustadt, Vice-Pres.; Eugene De Prez, Mgr.; Chas. Zimmermann, gasoline Engineer, and Vincent Liska, Supt.

Neustadt, Chas.—Vice-Pres. Neustadt Automobile & Supply Co., 3948-50 Olive St., St. Louis, Mo.

Neustadt, J. H.—Pres., Treas. and Executive Neustadt Automobile & Supply Co., 3948-50 Olive St., St. Louis, Mo.

Neustadt, L. J.—Sec. Neustadt Automobile & Supply Co., 3948-50 Olive St., St. Louis, Mo.

Neutral Equilibrium.—See Equilibrium.

Nevada Automobile & Supply Co.—Office and store, 115 Ramsey St., shops and garage N. Main St., Goldfield, Nev. (Pope-Toledo, Northern.) Est. 2 years. Not inc. N. H. Bertram, owner and Mgr.; Walter Hamilton, Asst. Mgr.; Frank H. Morse, Purch. Agt.; G. W. Dugan, Shop Supt. Garage, 40 cars; repairing.

Nevermiss Fire Extinguisher Co.—Middletown, N. Y. Mfrs. fire extinguishers.

Nevermiss Spark Plug Co.—321-323 Michigan Ave., E., Lansing, Mich. Mfrs. spark plugs, battery connections, wire terminals, ammeters, combustion and voltmeters, chain tools and coils. Est. June 1, 1904. Mem. M. & A. M. W. L. Azh, owner and proprietor.

Neveu et Cie., J.—169 Ave. du Roule. Neuilly-sur-Seine, France. Mfrs. wooden wheels, tops, and wooden rims.

Neville & Co.—Oshkosh, Wis. (Pope-Toledo.)

Nevin, E. D.—Sec. and Treas. The Belden Motor Car Co.; 720 Bessemer Bldg., Pittsburg, Pa.

Nevin, Ernest D.—507 Wood Ave., Pittsburg, Pa. (Darracq.)

New American Elevator Co.—Curtis and Jefferson Ave., Columbus, O. Mfrs. elevators for garages.

New Amsterdam Motor Car Co.—Brooklyn, N. Y. (Crawford.)

New Amsterdam Motor Co.—152 W. 56th St., New York City. (Crawford.) Est. 1905. Cap. \$75,000. Chas. Morgan, Pres.; F. M. Tench, Vice-Pres.; E. B. Percy, Treas.; Joseph Troxell, Sec. and Mgr. and head of the Automobile Renting Dept.; Charles Morgan, head of the

Selling Car Dept.; H. T. Kline, Carbide Dept. Repairing; rental service.

Newark Iron & Steel Co.—Newark, O. Mfrs. steel castings.

Newark Motor Car Co.—126-128 S. 14th St., Newark, N. J. (Wayne, Reo, Premier.)

Newark Repair & Garage Co.—213 Clinton Ave., Newark, N. J. Garage.

New Bedford Automobile Club.—New Bedford, Mass. Eli Watson, Sec.

Newbern Co., S. C.—430 Walnut St., Philadelphia, Pa. Mfrs. automobile body polishes and metal polishes.

New Britain Brass Co.—New Britain Conn. Mfrs. pipe and brass fittings.

Newburg Auto Shop.—299 Grand St., Newburg, N. Y. (Winton.) Garage; repairs.

Newburn, J. R.—Union City, Ind. (Northern.)

Newby, A. C.—Sec. Treas. and Gen. Mgr. National Motor Vehicle Co., E. 22d St., Indianapolis, Ind.

Newby's Automobile Inn.—1122 W. Broad St., New Castle, Ind. (Maxwell, Premier, National, Rambler.)

New Castle Automobile Co.—27 Cockran St., New Castle, Pa. (Pope-Toledo.)

New Columbia Machine Works.—239 Pearl St., Fort Wayne, Ind. (Kiblinger.)

Newcomb, A. H.—815 W. 21st St., Chicago, Ill. Mfrs. spark trimming devices.

Newcomb Automobile Co.—Wildwood, N. J. (Cadillac.)

Newcomb Carburetter Co.—1900 Broadway, New York City. Mfrs. carburetters.

Newcomb, F. S.—Post Hill, New London, Conn. (Maxwell.)

Newcombe Motor Co.—378 Jackson Ave., Long Island City, N. Y. Mfrs. steam automobiles and steam commercial automobiles.

New Departure Mfg. Co.—Bristol, Conn. Mfrs. bells and annular ball bearings.

Newell, O. H.—Coldwater, Mich. (Waltham.)

Newell, Dr. F. H.—Director Austin Automobile Club, Austin, Ill.

Newell, Jas. R.—819 Hay St., Wilkesburg, Pa. (Elmore.)

New Engine Co.—Acton, London, W., England. Mfrs. marine motors, automobile motors and gasoline automobiles. (N. E. C. cars.)

New England Automobile Co.—55 Berkeley St., Boston, Mass. Dealers in second-hand automobiles and parts. Jno. M. Barry, Gen. Mgr., Purch. Agt. and Advt. Mgr. J. F. Lane, Supt. Clarence E. Clifford, Sales Mgr.

New England Automobile Journal.—400 Westminster St., Providence, R. I.

Pub. second and fourth Saturdays of each month by the New England Automobile Journal Pub. Co. Wm. H. Black, Treas.; David O. Black, Jr., Sec.

New England Automobile Mfg. Co.—27 State St., Boston, Mass. Mfrs. gasoline automobiles.

New England Automobile Top Co.—229 W. 54th St., cor. Broadway, New York City. Mfrs. wind shields, automobile tops and slip covers. Cap. \$12,000. Est. Oct. 1, 1907. G. A. Mackey, Pres. and Treas.; Geo. L. Wilson, Vice-Pres.; B. Eisenstein, Sec.

New England Engine & Boat Assn.—5 Park Sq., Boston, Mass. C. A. Sanders, Pres.; J. S. Poyen, Vice-Pres.; J. M. Schoonmaker, Treas.; Chester I. Campbell, Sec. Board of Directors: C. A. Sanders, Harry Wright, J. S. Poyen, A. W. Toppan, Chester I. Campbell, Geo. F. Lawley and W. J. Young.

New England Forge Co.—9 Plymouth St., Worcester, Mass. Mfrs. crank shafts and gear blanks.

New England Motor Co.—82-88 Fletcher St., Lowell, Mass. Mfrs. storage igniters. Cap. \$25,000. Est. 1897. Geo. W. Fifield, Pres.; A. R. Bliss, Sec., Treas. and Gen. Mgr. Mem. M. & A. M.

New England Steel Castings Co.—Hyde Park, Mass. Mfrs. steel castings.

New Era Co.—56 Galen St., Watertown, Mass. (Glide.)

New Era Gas Engine Co.—9 Doyle Ave., Dayton, O. Mfrs. air compressors.

New Era Mfg. Co.—Kalamazoo, Mich. Mfrs. babbitt metal and bronze metals.

Newhall, B. R.—Head of Automobile Dept., Syracuse Rubber Co., 212-14 S. Clinton St., Syracuse, N. Y.

New Hampshire Automobile Club.—Exeter, N. H. Chas. G. Sheldon, Sec.

New Haven Automobile Corporation.—53 Broadway, New Haven, Conn. (Pope-Hartford, Pope-Toledo. Pope-Waverley.)

New Haven Button Co.—New Haven, Conn. Mfrs. all kinds of cloth and leather covered buttons and nails, including clinch buttons. Cap. \$20,000. Est. 1889. A. Freschl, Pres.; H. W. Asher, Vice-Pres.; H. T. Beers, Treas.; Peter Colgan, Sec.

New Haven Carriage Co.—New Haven, Conn. Mfrs. wooden and metallic bodies and wood wheels.

New Haven Copper Co.—New Haven, Conn. Mfrs. sheet and rod brass and copper and brass and copper metals.

Newington, W. H.—Garage Mgr. Ketchum & Co., Bank and Sparks Sts., Ottawa, Canada.

New Jersey Aluminum Co.—19th and Springfield Aves., Newark, N. J. Mfrs. aluminum, brass, bronze, aluminum and copper castings, license numbers, tire holders and tire irons.

New Jersey Asbestos Co.—Camden, N. J. Mfrs. asbestos gaskets and packing.

New Jersey Automobile Car Co.—239 Halsey St., Newark, N. J. Garage.

New Jersey Automobile and Motor Club.—1034 Broad St., Newark, N. J. H. A. Bonnell, Sec.

New Jersey Automobile Co.—855-857 Springfield Ave., Newark, N. J. (Moline, Aerocar.) Est. 1904. Cap. \$125,000. A. N. Brunner, Pres.; A. B. Ward, Vice-Pres.; W. F. Indergrund, Sec.; F. R. Laisant, Treas. Garage, 25 cars; repairing; renting; supplies.

New Jersey Car Spring & Rubber Co.—Wayne and Brunswick Sts., Jersey City, N. J. Mfrs. hose couplings, gaskets, rubber mats, packing, rubber tubing and washers.

New Jersey Motor Co.—49-51 Bank St., Newark, N. J. (Ford.)

New Jersey Steel Co.—Rahway, N. J. Mfrs. steel castings.

New Jersey Tube Co.—Newark, N. J. Mfrs. exhaust horns and brass and copper tubing.

New Jersey Vulcanizing Co.—83 Halsey St., Newark, N. J. Garage.

Newlin, W. G.—128 Pipestone St., Benton Harbor, Mich. (Rambler.)

New London Motors, Ltd.—Aspley, Nottingham, England. Mfrs. gasoline automobiles. (Leader.)

New London Automobile Station.—94 Main St., New London, Conn. (Thomas Flyer, Thomas-Detroit, Haynes.) Est. 1904. Partnership C. K. Smith and Arthur Brookes. Garage, 15 cars; repairing.

New London Motor Co.—New London, Conn. Mfrs. gasoline motors.

Newman, A. V.—Purch. Agt. Humphrey's Mfg. Co., 201 E. 5th St., Mansfield, O.

Newman Bros.—134 Main St., Hackensack, N. J. Garage.

Newman Clock Co.—Masonic Temple, Chicago, Ill. Mfrs. automobile clocks.

Newman Investment Co.—El Paso, Tex. (Buick.)

Newman, O. H.—Belmar, N. J. (Maxwell.)

Newmarch, L. A.—Sidney, New South Wales. (Lambert.)

Newmastic Tire Co.—151 W. 68th St., New York City.; 302 Michigan Ave., Chicago, Ill.; 4148 Olive St., St. Louis, Mo. Mfrs. tire fluid.

New Orleans Motor Co., Ltd.—Twickenham, England. Mfrs. gasoline automobiles. (Orleans.)

Newport Engineering Works.—359-365 Thames St., Newport, R. I. Dealers and sub-agents in automobiles and accessories, tires, foreign and American; oils, greases, etc. Fireproof garage, repair plant. Cap. \$20,000. Est. 1902. A. L. Mason, Pres., Treas. and Gen. Mgr.;

Earl P. Mason, Sec., Supt. and Mechanical Engineer; E. L. Mason, Vice-Pres.

Newport Mfg. Co.—18 S. Baptist St., Newport, R. I. Garage.

New Process Raw Hide Co., The.—500-514 Plum St., Syracuse, N. Y. Mfrs. rawhide gears, hardened steel gears, and fibre gears. Est. 1888. Mem. M. & A. M. T. W. Meachem, Pres.; T. G. Meachem, Vice-Pres. and Sales Mgr.; A. C. Vosburgh, Sec. and Treas.; W. H. Diefendorf, Chief Engineer.

New Process Steel Co., The.—Marshall, Mich. Mfrs. steel castings and chrome nickel steel.

Newton & Son, W. H.—127 Elm St., Cortland, N. Y. Mfrs. cushions.

Newton Centre Automobile Repair Station & Garage.—Beacon St., Newton Centre, Mass. Garage and repairing.

Newton Garage.—24 Brook St., Newton, Mass. Garage.

Newton, J. E.—Bedford and Troy Sts., Fall River, Mass. (Stevens-Duryea.)

Newton, Richard T.—Pres. Atlantic Motor Car Co., 1776 Broadway, New York City.

Newton & Son, W. H.—127 Elm St., Cortland, N. Y. Mfrs. automobile tops. Est. 1882.

New York & Brooklyn Automobile Supply Co.—1717 Broadway, New York City. Est. 1906. Partnership John F. Boh and D. E. Hydecker. Auto Supplies.

N. Y. & N. J. Lubricant Co.—14 and 16 Church St., New York City. Mfrs. non-fluid oils, oils. Est. 1896. Mem. M. & A. M. T. A. Matthews, Pres. and Treas.; W. F. Kimball, Vice-Pres.; J. H. Bennis, Sec.; F. J. Barnes, Asst. Treas.

New York Anti-Puncture Tire Co.—132W. 49th St., New York City. Mfrs. tire fluid.

N. Y. Asbestos Mfg. Co.—123 Cortland St., New York City. Mfrs. asbestos and gaskets.

New York Automobile College.—45 W. 44th St., New York City. Garage.

New York Automobile Co.—126-130 Lafayette, cor. State St., Utica, N. Y. (Reo, Ford, Aerocar.) Est. 1906. Garage. 20 cars. Repairing.

New York Automobile Garage.—306-8 W. 65th St., New York City. Garage.

New York Automobile Lamp Co.—585 Washington St., New York City. Mfrs. automobile lamps.

New York Auto Repository.—Ocean House Stables, Newport, R. I. Garage.

New York Automobile Club, The.—306 W. 109th St., New York City. Dr. E. T. Weed, Pres.; Andrew J. Cobe, Vice-Pres.; James Stuart Blackton, Treas.; I. E. Roskam, Sec. Directors: Dr. E. T. Weed, Andrew J. Cobe, James Stuart Blackton, I. E. Roskam, Edwin Churchman, Commander W. J. Sears, U. S. N.;

Bert G. Falhaber, Samuel C. Meyer, C. Sedgwick Levy, David C. Goodman, Conrad Hubert, Eldridge G. Snow, W. Woods, David J. Power and Samuel Steinfield.

New York Automobile Trade Association.—1876 Broadway, New York City. Organized April 16, 1903. "To afford mutual protection to its members and to the public." Charter members: Babcock & Linn, American Darracq Automobile Co., Mobile Storage & Repair Co., Pardee & Co., Locomobile Co. of America, Winton Motor Carriage Co., Barry & Hay Co., U. S. Long Distance Automobile Co., A. G. Spalding & Bros., International Motor Car Co., Studebaker Bros., John Wanamaker, Cadillac Co., Electric Vehicle Co., Homan & Schultz, Buffalo Electric Co. Officers: Percy Owen (Percy Owen, Inc.), Pres.; Frank Eveland (A. G. Spalding & Bros.), 1st Vice-Pres.; E. S. Partridge (Wyckoff, Church & Partridge), 2d Vice-Pres.; W. P. Kennedy, Treas.; Walter R. Lee, Gen. Mgr. and Sec. Chairmen of committees: Percy Owen, Carlton R. Mabley, W. M. Haradon, Carl H. Page and C. Andrade, Jr. Former presidents: Percy Owen and Carlton R. Mabley. Members: Automobile Ex. & Storage Co., Atlantic Motor Car Co., Automobile Import Co., American Locomotive Automobile Co., Bouton Motor Co., Broadway Automobile Exchange, Bowman Automobile Co., S. B.; Corbin Motor Vehicle Corp., Cadillac Co., Duerr & Co., C. A.; Darracq Motor Car Co., Diezman Shock Absorber Co., Duane & Co., W. J. Electric Vehicle Co., Ford Motor Co., Frayer-Miller Motor Car Co., Fogarty, Peter; Goodman, Frederick; Hol-Tan Co., Harrolds Motor Car Co., Homan & Schultz, Harlem Automobile Co., Hartford Suspension Co., Haynes Automobile Co., Kennedy, W. P.; Kull Automobile Co., A. L.; Locomobile Co. of America, Lozier Motor Co., Mabley, C. R.; Maxwell-Briscoe Co., Martini Import Co., Nichols & Co., D. P.; New York Motor Car Co., New York Transportation Co., Oldsmobile Co., Owen, Inc., Percy; Owen & Co., R. M.; Palmer & Singer Mfg. Co., Peerless Motor Car Co., Packard Motor Car Co., Parkway Garage Co., Peckham, R. T.; Ranney Co., A. Elliott; Rainier Motor Car Co., Renault Frères, Spalding & Bros., A. G.; Southworth & Co., A. G.; Scott Motor Co., Geo. J.; Studebaker Bros., St. Louis Car Co., St. Nicholas Automobile Co., Schultz, Theo. E.; Tuxedo Garage Co., Victor Automobile Co., Wyckoff, Church & Partridge, Waltham Mfg. Co., White Co., Winton Motor Carriage Co., West End Automobile Co. Promoted open air carnival and race meet at the Empire City track, May 24, 25, 26, 1902.

New York Belting & Packing Co., Ltd.—600 Prudential Bldg., Buffalo, N. Y. Mfrs. belting.

New York Belting & Packing Co.—25 Park Pl., New York City. Mfrs. solid tires.

New York Car & Truck Co.—(Auto Dept.), Kingston, N. Y. Makers of the Allen-Kingston car; first marketed, 1907. F. E. Moskovics, Gen. Mgr.; F. E. Moscovics and D. F. Graham, Designers; Geo. O. Hodge, Supt.; Ralph G. Lewis, Purch. Agt. Sole Sale Agents, The Allen-Kingston Motor Car Co., 3 W. 44th St., New York City.

New York Carriage Top Co.—509 W. 30th St., New York City. Mfrs. automobile tops.

New York City Garage.—10 W. 60th St., New York City. Garage.

New York Coach & Auto Lamp Co.—794-798 10th Ave., New York City. Mfrs. foot rests, acetylene generators, exhaust horns, adjustable lamp brackets, lamps and robe rails.

New York Coil Co.—338-340 Pearl St., New York City. Mfrs. spark coils.

New York Dash & Fender Co.—516-520 W. 36th St., New York City. Mfrs. dashes and fenders.

New York Gear Works.—56 Greenpoint Ave., Brooklyn, N. Y. Mfrs. transmission gears and circulating pumps.

New York Insulated Wire Co.—114 Liberty St., New York City. Mfrs. insulated wire.

New York Kerosene Oil Motor Co.—31 Burling Slip, New York City. Mfrs. kerosene motors and motor boats.

New York Leather Coat Co.—207 Green St., New York City. Mfrs. miscellaneous wearing apparel.

New York Motor Car Co.—231 W. 40th St., New York City. (Atlas trucks.)

New York Motor Fabric Co.—32 Union Sq., New York City. Mfrs. tire cases and lamp covers.

New York School of Automobile Engineers, Inc.—146 W. 56th St., New York City. Practical instruction in the care and operation of automobiles. Cap. \$25,000. Robert E. Fulton, Pres.; Percy Owen, Vice-Pres.; M. S. Gilmer, Treas. and Business Mgr.; Roger B. Whitman, Sec. and Technical Director. Faculty: Engine Dept., Julius C. Liebhardt, M. E. Ignition Dept., Philip K. Stern, E. E., M. E. Transmission Dept., Rudolf Grissman, M. E. Construction and Shop, Albert Capetillo. Special instructors for owners, Albert Trica, B. S.; G. Rudolph Ruckert, M. E. Road instructors, Matthew Farrell and Fred Kowsky. Designers' Course, E. Favary, M. E., E. E.

New York Sporting Goods Co.—17 Warren St., New York City. Est. 1897. Automobile, motorcycle, motorboat and bicycle sundries, general sporting goods

and novelties. P. R. Robinson, Pres.; Palen Nelson, Vice-Pres.; Jas. E. Murray, Sec. and Treas.; M. A. Dewey, Jr., head of Automobile Dept.; Fred Dewitt, head of Bicycle and Motorcycle Dept.

New York State Automobile Association.—Albany, N. Y. Oliver A. Quayle, Albany, N. Y., Pres.; H. S. Woodworth, Rochester, N. Y., Vice-Pres.; N. M. Pierce, Buffalo, N. Y., Treas.; C. D. Hakes, 84 S. Pearl St., Albany, N. Y., Sec. Membership: Adirondack Automobile Club, Albany Automobile Club, Automobile Club of America, Automobile Club of Auburn, Automobile Club of Buffalo, Automobile Club of Newburg, Automobile Club of Syracuse, Automobile Club of Schenectady, Automobile Club of Troy, Automobile Club of Utica, Automobile Club of Columbia County, Binghamton Automobile Club, Bronxville Automobile Club, Cattaraugus County Automobile Club, Chenango County Automobile Club, Cohoes Automobile Club, Elmira Automobile Club, Geneva Automobile Club, Hudson Valley Automobile Club, of Poughkeepsie; Long Beach Country Club, Long Island Automobile Club, Metropolitan Automobile Association, New York Motor Club, New York Automobile Club, Oneida Automobile Club, Oswego Automobile Club, Richmond County Automobile Club, Rochester Automobile Club, Wassertown Automobile Club, and Westchester Automobile Club.

New York State Steel Co.—475 Abbott Rd. and 1000 White Bldg., Buffalo, N. Y. Mfrs. steel.

New York Steam Rubber Tire Repair Works.—306 W. 52d St., New York City. Vulcanizing.

New York Stencil Works.—100 Nassau St., New York City. Mfrs. name plates, steel stamps and stencils.

New York Taxicab Co.—546 5th Ave., New York City. Rental service.

New York Timers' Club.—P. O. Box 1453. New York City. Devoted to the interests of all sports for securing and keeping accurate time results. Organized fall of 1905. Chas. J. Dieges, Pres.; H. P. Burchell, Vice-Pres.; C. C. Hughes, Vice-Pres.; A. G. Harvey, Sec.; W. L. Jones, Treas. Former president, S. M. Butler. Honorary members: S. M. Butler and Jas. E. Sullivan. Members: P. A. Sayles, Geo. McGraham, Prosper Clust. J. J. McHugh, S. A. Cramer, S. D. Sec. John J. O'Brien, J. J. Dolan.

New York Transfer Co.—Garage, 524 W. 36th St., New York City. Garage.

New York Transfer Co.—344 W. 50th St., New York City. Garage.

New York Transportation Co.—49th St. and 8th Ave., 66th St. and 3d Ave., 27th St. and 9th Ave., Bayard St. and Bowery, New York City; 19 Downing St.,

Newport, R. I. Agents Exide batteries. Columbia cars. Principal business is automobile livery service. Cap. \$5,000,000. Est. 1899. Richard W. Meade, Pres.; Wm. H. Palmer, Jr., Sec. and Treas.; L. K. Clark, Gen. Supt.; A. C. Tully, Pur. Agt. Garages.

New York Wire & Spring Co.—Hoboken, N. J. Mfrs. seat springs.

New York Yacht, Launch & Engine Co.—Morris Heights, N. Y. Mfrs. motorboats.

Ney, G.—128 rue St. Maur, Paris, France. Mfr. roller bearings.

Niagara Falls Automobile Transit Co.—103 Main St., Niagara Falls, N. Y. (Cadillac, Winton.) Supplies; garage; repairing.

Niagara Falls Brass Works, Inc.—146 Virginia St., Buffalo, N. Y. Mfrs. aluminum, brass, bronze castings. Theo. Hoffeller, Pres.; Julius Hoffeller, Treas.

Niagara Iron, Steel & Metal Co.—835 Ashland St., Niagara Falls, N. Y. Mfrs. sheet and bar iron and steel.

Niagara Motor Boat Co.—N. Tonawanda, N. Y. Mfrs. motorboats.

Niagara Surface Coating Co.—Erie and 9th Sts., Niagara Falls, N. Y. Mfrs. varnish.

Niagara Tachometer & Instrument Co.—26th and Adams Sts., Niagara Falls, N. Y. Supplies.

Nice Automobile.—Pub. at 4 Ave. Malmaison, Nice, France.

Nice, Eugene E.—272-274 S. 2d St., Philadelphia, Pa. Mfr. varnishes.

Nichols & Co., D. P.—220 Eliot St., Boston, Mass. (Frayer-Miller.)

Nichols & Son, D. P.—116-122 W. Brookline St., Boston, Mass. Mfrs. wooden and metallic bodies and automobile tops.

Nichols, E. L.—Adv. Mgr. Holtzer-Cabot Electric Co., Brookline, Mass.

Nichols, J. Hervey.—1636 Broadway, Denver, Colo. (Winton.)

Nichols, J. T.—Director and Designer, Chadwick Engineering Works, 3207 Spring Garden St., Philadelphia, Pa.

Nichols, Scott D.—Federal and Front Sts., Troy, N. Y. (Ford, Premier, Maxwell, Rambler.)

Nichols, T. W.—Mgr. West Garage, cor. Milton Ave. and Front St., Ballston Spa, N. Y.

Nichols, W. L.—244 W. 49th St., New York City. Garage.

Nicholls, Wm. S.—253 Broadway, New York City. Mfrs. portable cranes and hoists.

Nicholson, E. W.—Sales and Adv. Mgr. Moline Auto Co., East Moline, Ill.

Nicholson, John J.—Gen. Sales Mgr. Murphy Varnish Co., Newark, N. J.

Nicholson Mfg. Co., H.—68 Dey St., New York City. Mfrs. washing apparatus.

Nick, W. H. F.—Sec. and Treas. Erie Stamping & Mfg. Co., 646 W. 12th St., Erie, Pa.

Nickel.—A metal discovered in 1751 by Cronstedt. It is extracted from arsenious ores (in Germany), or magnesium and siliceous ores or "garnierite" (in New Caledonia and the United States). It is grayish-white, of fibrous fracture, and the hardest of ordinary metals after manganese and chrome. In this country, where most nickel is extracted, an electrolytic process is employed, the ore being first submitted to a preliminary treatment like that for what is called the Mond process. The metal is slightly less fusible than iron, and is magnetic and scarcely oxidizable. It is used as an adjuvant, alloyed or not with chrome, in the metallurgy of steel (nickel-steel). It enters into the composition of "German silver." q. v. It is utilized in a pure or carburized form in the operations of nickel-plating. It is used also, in the form of oxide, in the alkaline accumulators of Jungner and Edison.

Nickel, Ferro.—See Ferro-nickel.

Nickel-plating.—A metallurgical operation designed to protect ordinary metals, such as cast-iron, iron, copper, etc., with an adherent layer of pure nickel of a brilliant aspect, durable and but slightly alterable by moisture. The nickel-plating of cast or wrought iron is frequently preceded by an intermediate deposit of copper designed to increase the adhesion of the nickel. Nickel-plating is effected by means of aqueous solutions of nickel salts, preferably sulphate of nickel or double sulphate or nickel and ammonia. This solution constitutes the nickel-plating bath. The piece to be plated having been freed from grease and cleaned with great care, is connected to the pole (cathode) of an electric source (battery, dynamo, or accumulator) of a few (2 to 4) volts. The current is formed in the bath by a plate of nickel connected to the positive pole and operating as a soluble anode, that is to say, gradually dissolving in the bath and restoring to it the nickel deposited upon the piece to be plated. After a few hours of action the deposit of nickel is sufficiently thick. The object is then removed from the bath, thoroughly washed with water and finally polished.

Nickel-steel.—See Steel, Nickel.

Nickerson Co., F. A.—642 Congress St., Portland, Me. (Pierce Arrow.)

Nickerson, Ed.—Bourne, Mass. (Walham.)

Nickerson, H. B.—Sec. American Steam Gauge & Valve Co., 220 Camden St., Boston, Mass.

Nicol, Frank V.—Sec., Treas., Sales Mgr. and Gen. Mgr. American Machine

Mfg. Co., cor. Champlain and Beaubien Sts., Detroit, Mich.

Nicoll & Co., Ltd., H. J.—22 Cornhill, London, E. C. England. Mfr. wearing appare.; coats.

Nielson, V. A.—Vice-Pres. & Mgr. Metropolitan Auto Co., Wangedahl, 1157 Berkeley, Boston, Mass.

Nieuport.—9 rue de Seine, Suresnes, France. Mfrs. high tension magnetos and spark plugs.

Niles-Bement-Pond Co.—111 Broadway, New York City. Mfrs. special automobile machinery, portable cranes and hoists, screw machine products and tube expanders.

Nilmelior Société d'Electricite.—47 rue Lacordaire, Paris, France. Mfrs. low tension magnetos, high tension magnetos and coils.

Nipp, Chas. F.—Minneola, Ia. (Wal-tham.)

Nippers.—Pliers, either for holding or for cutting metal, etc.



Nipple.—A piece of pipe with a male thread cut the greater part or whole of the length, or at each end (see figure).

Nipple, Spray.—The same as "spray-nozzle." See Nozzel, Spray.

Nisbet, Theo. B.—Treas. Victor Shock Absorber Co., 1937 Broadway, New York City.

Nitrogen.—A colorless, odorless, tasteless gas, of the atomic weight 14 and density 96.

Nitrogen forms about four-fifths, by volume, of the atmosphere, and is, in combination, a necessary constituent of all plants and animals. It is called also "azote." In the mixture of air and gasoline vapor which "explodes" in motors its presence is inimical since it consumes, without useful effect, considerable space which ought to be occupied by active molecules.

Niven, W. R.—Treas. Bellefontaine Automobile Co., Bellefontaine, O.

Nixon, Lewis.—Pres. Standard Motor Construction Co., 180 White St., Jersey City, N. J.

Noah, Andrew H.—Tres. The Diamond Rubber Co., Akron, O.

Noakes Bros.—Corpus Christi, Tex. (Buick, Cadillac.)

Noank Motor Works.—Noank, Conn. Mfrs. gasoline marine motors.

Noble, Warren.—Mech. Eng. and Designer. Palmer & Singer Mfg. Co., 1220-24 Broadway, New York City.

Nock Auto Co., L.—141 Dyer St., Providence, R. I. (Stoddard-Dayton.)

Nock Co., Inc., Geo. W.—126 N. 4th St., Philadelphia, Pa. Est. 1830. Automobile and bicycle supplies, locks and locksmiths' supplies, electrical goods,

etc. Geo. W. Nock, Pres. and Gen. Mgr.; Isaac Ecret, Vice-Pres. and Pur-Agt.; Geo. W. Malpass, Sec. and Treas.

Nock, F. S.—Water St., East Greenwich, R. I. Naval architect and engineer. autoboot and power craft of all descriptions.

Nock, Geo. W.—Pres. and Gen. Mgr. Geo. W. Nock Co., Inc., 126 N. 4th St., Philadelphia, Pa.

Noel, E. Percy.—Automobile Editor, N. Y. Commercial. B. St. Louis, Mo., Aug. 4, 1882. Ed. Smith Academy, St. Louis; King's School, Stamford, Conn., Dartmouth College. American correspondent, The Car, London, and general contributor to motor publications. Mem. Phi Delta Theta Fraternity, Dartmouth Club of N. Y., Phi Delta of N. Y., N. Y. Motor. Used first car 1898, cross-country trip with Peerless, 1905. St. Louis correspondent for Automobile, Motor Age, Motor Way, and various French and English papers from 1902 until Aug., 1906.

Noera Manufacturing Co.—Waterbury, Conn. Mfrs. lubricators, oil cans, oil guns, oil pumps and tire pumps.

Nolan, Wm.—541 Tremont St., Boston, Mass. Mfrs. automobile trunks, trunk racks, automobile tops, glass wind shields.

Nolte Brass Co.—Springfield, O. Mfrs. brass, bronze, aluminum and copper castings, and throttle valves.

No-Match Electric Mfg. Co.—141 Milk St., Boston, Mass. Mfrs. gas lamp burners.

Nominal Horse-power.—See Power, Horse, Nominal.

Non-Corrosive Metal Co., Inc.—Wartertown, Conn. Mfrs. brass, bronze, aluminum and copper castings and metal trimmings.

Non-Explosive Safety Naphtha Container Co.—1133 Broadway, New York City. Mfrs. tanks.

Non-return Valve.—See Valve, Check.

Non-Skids.—Devices for preventing skidding or side-slip. Many hundreds of patents have been taken out for devices to prevent side-slipping. One class embraces all tires of which the anti-skid feature consists of indentations or protuberance moulded upon the tire. A second class comprises all non-skids made by vulcanizing studs or spikes into the rubber shoe. A third class includes all devices employing metal rivets, studs, spikes, or plates in combination with leather, either detachable or baked upon the tire. And a fourth includes all other devices, such as chain and bar grips, wire loops, toothed rim plates, and all-metal devices, as well as separate non-skid straps fastened on at intervals. This group embraces both fast and detachable types. The several chain

grips are the best known of the latter class. The separate non-skid straps do very effective service as creepers and are very convenient. Those of the wire loop or drag chain devices are very ingenious and do their work well. Many non-skids are also puncture-proof. The treads of such tires, usually of leather, offer great resistance to punctures, while generally carrying hob-nails to prevent skidding, and, at the same time, relieving the tire from road wear.

Noonan Tool & Machine Works.—Rome, N. Y. Mfrs. brass, bronze, aluminum and copper castings, license numbers, brass and nickel plating, tools, trunk racks, valve lifters, muffler cut-out valves and wire terminals. (Rambler.)

Norbeck & Nicholson.—Redfield, N. D. (Maxwell.)

Norburg, R.—Supt. Willard Storage Battery Co., 1279-81 Bank St., Cleveland, O.

Norcross Auto Co.—43 Foster St., Worcester, Mass. (Buick.)

Norcross Cameron Co.—57 Bridge St., Springfield, Mass. (Corbin, Ford, Rambler.) Garage and supplies.

Nordgren & Holderman.—Paxton, Ill. Garage.

Nordyke & Marmon Co.—Indianapolis, Ind. Makers of the Marmon car; first marketed in 1904. Agents and dealers: Big Four Automobile Co., 110 E. 9th St., Los Angeles, Cal.; Brazier Auto Works, 38th and Market Sts., Philadelphia, Pa.; Heller-Spawm Motor Car Co., Binghamton, N. Y.; Pennsylvania Auto Co., cor. Hay St. and Kelly Ave., Wilkinsburg, Pa.; Rickey Machine Co., 92 Eaton Pl., East Orange, N. J.; Snodeal Auto Co., 2552 Madison Ave., Baltimore, Md.; John Use, Jr., 172 12th St., Milwaukee, Ws.; Van Automobile Co., 4706 Washington Ave., St. Louis, Mo.; Waterloo Automobile Co., Waterloo, N. Y.; Wing, F. E., Motor Car Co., 12 Columbus Ave., Boston, Mass.

Norfolk Horse Carriage & Auto Co., Inc.—Norfolk, Va. Garage.

Normal.—Perpendicular; specifically, a perpendicular to a curve or curved surface. (2) A usual or accepted rule of process.

Norris Automobile Co.—Genesee Ave., Saginaw, Mich. (Peerless, Buick, Cadillac, Oldsmobile, and Woods.) Mfrs. tire protectors.

Norris City Garage.—Main and Chain Sts., Norristown, Pa. Garage.

Norris Manufacturing Co.—27 Western Ave., Cambridge, Mass. Mfrs. feed water heaters.

Norris, W. L.—Mgr. Pittman & Nelson Automobile Co., 2036 Addison St., Berkeley, Cal.

North, A. G.—Pres. Rapid Motor Vehicle Co., Rapid St., Pontiac, Mich.

North, S. H.—Sec'y Treas. and Head of Office, Chase, Roberts & Co., West Ave. and Fifth St., Long Island City, N. Y.

North & Pfeiffer Mfg. Co.—72 Chestnut St., New Britain, Conn. Mfrs. spark plugs.

North British Rubber Co., Ltd.—Castle Mills, Edinburgh, Scotland. Mfrs. pneumatic tires.

North Division Automobile Co.—385 E. Superior St., Chicago, Ill. Garage.

North Carolina Mica Co.—95 Blackstone St., Boston, Mass. Mfrs. eye shields, and mica.

North Chicago Machine Co.—North Chicago, Ill. Mfrs. carbureters, clutches, gasolene automobile motors and gasolene marine motors.

North End Garage Co.—Sawyer St., New Bedford, Mass. Garage.

North End Motor Car Co.—292 N. Park St., East Orange, N. J. Garage.

North Jersey Automobile & Eng. Co., Inc.—Hackensack, N. J. (Mercedes and Winton.)

North Jersey Automobile Club.—Patterson, N. J. Rob't. Beattie, Jr., Secretary.

North Jersey Motor Car Co.—25 Washington Place, East Orange, N. J. Garage.

North Penn. Iron Co., The.—3rd and Venango Sts., Philadelphia, Pa. Mfrs. turntables. Cap. \$27,000. Est. 1892. Philip S. Maloney, Pres.; Philip M. Maloney, Sec. and Treas.; W. H. Barrows, Chief Engineer. R. L. Colfax, Purchasing Agent.

North Philadelphia Automobile Station.—3425 N. Broad St., Philadelphia, Pa. Repairing.

North Shore Automobile Garage.—2520 Harrison St., North Evanston, Ill. (Buick.)

North Side Automobile Station.—446 North Clark St., Chicago, Ill. Garage.

Northampton Auto School & Garage Co.—Northampton, Mass. Garage.

Northampton Garage Co.—Northampton, Mass. Garage. (Atlas.)

Northern Automobile Co.—1447 Michigan Ave., Chicago, Ill. (Peerless.)

Northern Automobile Co.—402 Golden Gate, San Francisco, Cal. (Northern.)

Northern Garage.—3315 13th St., Philadelphia, Pa. Garage.

Northern Garage.—97 Virginia Pl., Buffalo, N. Y. Garage.

Northern Motor Car Co.—Champlain and Canton Sts., Detroit, Mich.; branch factory at Port Huron, Mich. Makers of the Northern car; first marketed March 1, 1903. Two models made since. Cap. \$500,000. W. T. Barbour, Pres.; G. B. Gunderson, Vice-Pres.; V. M. Gun-

derson, Sec., Treas., Gen. Mgr. and Sales Mgr. Agents and dealers: Atland, M. J., Alpena, Mich.; Auburn Automobile Co., Auburn, N. Y.; Bagnell Automobile Co., 4152 Olive St., St. Louis, Mo.; Barker & Hitch, Ltd., Girard, Kas.; Barron & Co., A. H., Gardner, Mass.; Carolina Garage Co., 1216 Plain St., Columbia, S. C.; Cia Pan Americana de Vehiculos, S. A., Mexico City, Mex.; Consolidated Wagon & Machine Co., Salt Lake City, Utah; Cooley, B., Galena, Kas.; Crossett Mercantile Co., Crossett, Ark.; Crescent City Automobile Co., 217 S. Rampart St., New Orleans, La.; Curtin-Hebert Co., Gloversville, N. Y.; Dale, Chas., Jr., Plattsburg, N. Y.; DeCant, L. G., 3 Lansing Block, Watertown, N. Y.; Diamond Motor Car Co., 959 S. Main St., Los Angeles, Cal.; Edgewood Automobile Co., 376 Smith St., Edgewood, R. I.; Eikenberry, A. L., 126 W. 4th St., Greenville, O.; Gorham, B. W., Mt. Kisco, N. Y.; Gorham, B. W., Mt. Kisco, N. Y.; Grooves, H. B., Sioux City, Ia.; Guerra & Co., Merida, Yucatan, Mex.; Huron Auto & Electrical Co., Port Huron, Mich.; Kilpatrick, J. A., Lebanon, O.; Mar-Del Mobile Co., Charles St., Baltimore, Md.; Martin Auto Co., Hutchinson, Kas.; Martin, C. F., Bellefontaine, O.; Mason's Carriage Works, Davenport, Ia.; Mills, James, Newark, O.; Morrow-Thomas Hardware Co., Amarillo, Tex.; Motor Car Co. of N. J., 291 Halsey St., Newark, N. J.; Nevada Automobile Supply Co., Goldfield, Nev.; Newburn, J. R., Union City, Ind.; Northern Auto Co., 402 Golden Gate Ave., San Francisco, Cal.; Quirk, W. F., Big Rapids, Mich.; Sanford, M. C., Clyde, O.; Schwerin, J. A., Sumter, S. C.; Scott, A. J., Rugby, N. D.; Shugert, Dr. Guy S., Rochester, Pa.; Starr & Son, J. G., Decatur, Ill.; Tragardh & Co., John, Gotenberg, Sweden; Trimble, G. T., Ellsworth, Kan.; Uhquhart, A. S., Calgary, Can.; Wilson, A. H., Canton, O.; Chicago Vulcanizing Co., Chicago, Ill.; Wilson Auto Co., Wichita, Kan.; A. H. Grisinger, Santa Cruz, Cal.; C. G. Layton, Danville, Ill.; Humphreys, Schloot & Co., Linton, Ind.; Copeland & Taylor, Pontiac, Ill.; C. W. Evans, Dixon, Ill.

Northrop, H. L.—Pres., Treas. and Mgr. Syracuse & Eldridge Glove Co., 924 S. Salina St., Syracuse, N. Y.

Northrop Lubricating Oil Co.—308 N. Commercial St., St. Louis, Mo. Mfrs. grease and oils.

Northway Motor & Mfg. Co.—Grand Ave., Detroit, Mich. Mfrs. axles, clutches, brake and clutch cork inserts, transmission gears, gasoline automobile motors.

Northway, Thomas J.—92 Exchange St., Rochester, N. Y. (Rainier, Rambler,

Ford, White, Reo.) Mfr. adjustable lamp brackets.

Northwest Motor Co.—2nd Ave., Spokane, Wash. Garage.

Northwest Motor Co.—Broadway and Union St., Seattle, Wash. (White, Columbus.)

Northwestern Cadillac Co.—316-322 4th Ave., Minneapolis, Minn. (Cadillac, Pope-Waverley.)

Northwestern Motor Car Co.—1928-30 N. 20th St., Philadelphia, Pa. (Moline.) Est. Dec., 1906. Cap. \$15,000. Robert A. Balfour, Pres.; A. Brehman, Sec.; Alois S. Datz, Treas.; John A. Burns, Gen. Mgr. Garage, 75 cars. Repairing.

Northwestern Motor Vehicle Co.—112 S. 6th St., Minneapolis, Minn. Garage.

Northwestern Storage Battery Co.—448 Milwaukee St., Milwaukee, Wis. Mfrs. storage batteries, electric searchlights, side lamps and rear lamps. Cap. \$200,000. Est. Jan., 1902. E. J. Knapp, Pres., Treas. and Gen. Mgr.; J. H. Knapp, Vice-Pres.; F. E. Scudder, Sec'y.

Nortmann-Duffke Foundry Co.—26th and Layton Ave., Milwaukee, Wis. Mfrs. pressed steel tanks, deep stamping, crucible steel and grey iron castings. Cap. \$50,000. Est. 1892. Partnership: Valentine Nortman & Louis Duffke. Daniel Homer, Head of the Pressed Steel Tank Dept. Louis Duffke, Head of the Steel Castings Dept., and Valentine Nortmann, Head of the Grey Iron Casting Dept.

Nortmann, Valentine.—Officer and Head of Grey Iron Castings Dept. Nortmann-Duffke Foundry Co., 26th St. and Layton Ave., Milwaukee, Wis.

Norton & Jones Machine & Tool Works.—East Main St., Plainville, Conn. Mfrs. tools.

Norton Auto Co., S. E.—14 E. 1st St., La Junta, Colo. (Waltham.)

Norton, C. E.—Water St., Guilford, Conn. Garage.

Norton Electrical Instrument Co.—Manchester, Conn. Mfrs. ammeters and voltmeters.

Norton Emery Wheel Co.—Buffalo Ave., Niagara Falls, N. Y. Mfrs. emery wheels.

Norton Grinding Co.—Worcester, Mass. Mfrs. crank shafts, special automobile machinery.

Norton, H. D.—Treas. and Gen. Mgr. Gies Gear Co., 345-347 Bellevue Ave., Detroit, Mich.

Norton Mfg. Co.—Deritend Bridge, Floodgate St., Birmingham, Eng. Mfrs. Norton motorcycles.

Norton, R. C.—Treas. Baker Motor Vehicle Co., 80th St., N. W. Cleveland, O.

Norton, R. D.—Hightstown, N. J. Garage. (Maxwell.)

Norton, W. T.—Supt. Kansas City Motor Car Co., Sheffield, Mo.

Norton, W. W.—Supt. The Auto Car Co., Ardmore, Pa.

Norwalk, A. B.—Pres., Treas. and Gen. Mgr. 35 Per Cent. Auto Supply Co., 83 Chambers St., New York City.

Norwalk Brass Co.—Norwalk, Conn. Mfrs. brass, bronze, aluminum and copper castings.

Norwalk Launch Co.—Norwalk, Conn. Mfrs. motorboats.

Norway Iron & Steel Co.—York, Pa. Mfrs. malleable iron and steel castings.

Norwich Motor & Machine Co.—30 Lackawanna Ave., Norwich, N. Y. Garage.

Norwood Automobile Co.—Norwood, O. Garage.

Norwood Garage.—121 Norwood Ave., Buffalo, N. Y. Cap. \$100,000. Incorporators: E. E. Denniston, Nelson P. Baker and George J. Day.

Norwood, J. E.—Pres. and Treas. Automobile Supply and Storage Co., 1416 Madison Ave., Baltimore, Md.

Nose.—The projection on a cam. See Cam. (2) The bow or beak of a vessel.

Notched Quadrant.—See Quadrant, Notched.

Notting & Son.—Prospect, O. Mfrs. gasoline marine motors.

Nourse, F. R.—Louiston, Idaho. (Holzman.)

Novelty & Repair Shop.—Milford, O. Mfrs. tube expanders.

Novelty Manufacturing Co.—Jackson, Mich. Mfrs. automobile heaters.

Novelty Tufting Machine Co.—1200 Michigan Ave., Chicago, Ill. Mfrs. tufting and upholstering machines.

Noxal Polish Mfg. Co.—1238 Belmont Ave., Philadelphia, Pa. Mfrs. metal polishes.

Noxon, C. Per Lee.—500 E. Water St., Syracuse, N. Y. Mfr. spark coils.

Noye Mfg. Co.—56 Lake View Ave., Buffalo, N. Y. Mfrs. radiators, hoods, dashes and tool boxes. Est. 1907. R. K. Noye, Pres.; Wm. H. Qlenny, Vice-Pres.; H. S. Madden, Sec., Treas. and Mgr. John A. Wilson, Jr., Sup't. of Automobile Dept.

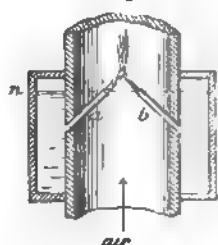
Noye, R. K.—Pres. Noye Mfg. Co., 56 Lakeview Ave., Buffalo, N. Y.

Noyes, C. B.—Head of Automobile Dept., Roehm & Davison, Ltd., 91-95 West Woodbridge St., Detroit, Mich.

Noyes, H. G.—Gorham, N. H. (Jackson.)

Noyes, William S.—Sec. Imperial Brass Mfg. Co., 245-247 S. Jefferson St., Chicago, Ill.

Nozzle, Spraying.—A nozzle, called also an "atomizing nozzle," with a very small



aperture designed to reduce the liquid passing through it into exceedingly fine atoms. The form and number of the nozzles is variable according to the make of

the carburetter. In the Brasier carburetter (see figure) there are two nozzles, a and b, for which is claimed the advantage of producing a better mixture, or rather, a scattering of the spray throughout the whole incoming stream of air. In some other makes of carburetter the number of nozzles is six. See Carburetter.

Nuckols H. W.—Treas. and Sec. Electric Vehicle Co., 1 Laurel St., Hartford, Conn.

Nungesser Electric Battery Co.—3519 King Ave., N. E., Cleveland, O. Mfrs. dry batteries. Cap. \$100,000. Est. 1896. A. B. Foster, Pres.; J. W. Vanderwerf, Vice-Pres.; M. M. Hobart, Sec.; H. G. Robins, Treas.; P. P. Nungesser, Gen. Supt. Mem. M. & A. M.

Nungesser, P. P.—Gen. Supt. Nungesser Electric Battery Co., 3519 King Ave., N. E. Cleveland, O.

Nürnberg Herkules Werke, Actiengesellschaft.—Nürnberg, Germany. Mfrs. motorcycles.

Nut.—A block of metal with a cylindrical hole through the center which is tapped with a thread so that it can be fitted to the end of a screw or bolt of the same pitch, and the object of which is to hold two pieces of mechanism firmly in place. Nuts are screwed up with wrenches, the size and strength of which should be proportioned to the diameter of the bolt. The majority of nuts used in mechanics have six facets or sides called "panes." (See figure.) The intersection of the panes is called the "angle," and the internal threading is called "female"



in contradistinction to that of the bolt which is called "male." Nuts may be round, square, hexagonal, castellated, winged, etc. The trembling motion of a car has the effect of loosening nuts, and if there is a single one that is not provided with a locking-device, it should be occasionally examined and tightened. There are five ways of keeping nuts on—that is, of tightening them, viz.: (1) A set-pin or set-screw; (2) a lock-nut; (3) spring washers; (4) a split-pin, and (5), a locking-piece.

The most important nuts to lock, and

those which must be locked on all motor-cars, are all those in the steering-gear, all at each end of the connecting-rod, and all that keep the wheel on.

Nut, Acorn.—An internally threaded cap, so called because of its shape.

Nut, Back.—The same as lock-nut.

Nut, Box.—A nut with a cover which protects the end of the bolt from injury, rusting, etc., in exposed situations, thus preventing jamming of the nut on the end of the bolt.

Nut, Butterfly.—Same as finger-nut.

Nut, Castellated.—A nut with its head notched, like the turret of a castle.



After it has been screwed up tight and the bolt drilled through in a line with one of the slots, and a split-pin inserted, it forms one of

the best of locking devices.

Nut, Check.—The same as lock-nut.



Nut, Finger.—A nut provided with wing-like projections, so that it can

be turned with the fingers.

Nut Fly.—See Nut, Finger.

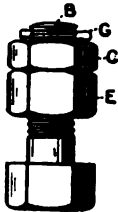
Nut, Helicoid.—An internally threaded helical spring, which when screwed home maintains a constant pressure against the under side of the thread so that it cannot work loose.

Nut, Jam.—The same as lock-nut.

Nut, Knurled.—The same as milled nut.



prevents it from unscrewing.



Nut-lock.—A piece of metal of one form or another fixed near a nut and which, embracing four or six of its sides,

Nut, Lock.—A thin auxiliary nut, C (see figure), screwed on the top of an ordinary nut, E, and secured by a pin, G, to prevent the nut from becoming loose on its bolt, B.



Nut, Milled.—A nut having a circular edge provided with striations in order to afford a firm hold for the fingers in screwing or unscrewing it.

Nut, Pinch.—The same as jam-nut. See Nut, Jam.

Nut, Safety.—The same as lock-nut, q. v.

Nut, Set.—A nut set against another to hold it in place.

Nut, Sleeve.—A long nut provided with a right-hand thread at one end and a left-hand thread at the other; used for coupling and drawing together two pipes or two rods.

Nut, Spigot.—A nut used to connect two pieces of tubing end to end; commonly called a union-nut.

Nut, Steering.—See Steering-gear.

Nut, Stuffing.—A nut which squeezes packing tightly around a pipe to prevent leakage.

Nut, Thumb.—The same as "finger nut."

Nut, Union.—The same as spigot-nut.

Nut, Wing.—The same as finger-nut.

Nute & Keena.—Seattle, Wash. (Packard.)

Nuttall Co., R. D.—Fayette St. and Garrison Way, Pittsburg, Pa. Mfrs. differential gears, transmission gears, and rawhide gear wheels.

Nutting Machine Co.—Dayton, O. Mfrs. carburetters, gasoline automobile motors.

Nutzel Fred.—1108 S. 5th St., La Crosse, Wis. (Rambler.)

Nyack Auto Garage.—68 Burd St., Nyack, N. Y. (Maxwell.)

Nyberg Automobile Works.—30th St. and Michigan Ave., Chicago, Ill. Repairing and garage.

Nyberg, P. J.—Yonktown, S. D. (Cadillac.)

Nye, John.—Salt Lake City, Utah. (Waltham.)

Nye, Wm. F.—New Bedford, Mass. Mfr. oils.

O

Ω.—A symbol for "ohm."
O.—A symbol for "oxygen."
Os.—A symbol for "osmium."
O. K. Connector Co.—51 Waldo St., Worcester, Mass. Mfrs. wire terminals.
O. K. Machine Co.—887 Main St., Buffalo, N. Y. Garage, repairing and supplies.
O. K. Machine Works.—887 Main St., Buffalo, N. Y. Supplies, repairing and garage.
Oakes & Dow Co.—15 Chardon St., Boston, Mass. Mfrs. spark plugs.
Oakland Auto Garage.—12th St. and 8th Ave., Oakland, Cal. Garage.
Oakland Motor Car Co.—Pontiac, Mich. Mfrs. gasoline automobiles.
Oaks, R. A.—Supt. Ideal Mfg. Co., Portsmouth, O.
Oakum.—Tarred hemp used for caulking the seams of a boat.
Oathout Chas. W.—160 Broad St., Newark, N. J. (Jackson.)
O'Beirne & Co., F.—1737 Grand St., Kansas City, Mo. Garage.
Oberdorfer Brass Co., M. L.—804 E. Water St., Syracuse, N. Y. Mfrs. aluminum, brass, bronze and copper castings, circulating pumps.
Obermayer Co., S.—641 Evans St., Cincinnati, O. Mfrs. crucibles, graphite.
Oberrheinischer Verein für Luftschiffahrt.—(Strassburg Aero Club), Strassburg, I. E., Germany.
Obrecht, Jos.—Gen. Supt. Hess-Pontiac Spring & Axle Co., Pontiac, Mich.
O'Brien & Co., W. H.—115 Dearborn St., Chicago, Ill. Mfrs. carburetters.
O'Brien, Falconer.—Pres. Detroit Wire Spring Co., 295-305 Congress St., W., Detroit, Mich.
O'Brien, J. H.—Supt. and Purch. Agt. Dragon Motor Co., 31st, 32nd, and Chestnut Sts., Philadelphia, Pa.
O'Brien, M. R.—22 Wood Ave., Providence, R. I. (Dolson.)
Occident Motor Car Co.—2731 W. Pico St., Los Angeles, Cal. (Cartercar.)
O'Connor, M.—201 W. 46th St., New York City. Vulcanizing.
O'Connor, Mark C.—Purch. Agt. Forest City Motor Car Co., 109-149 Walnut St., Massillon, O.
O'Connor, Thos. C.—Vice-Pres. York Motor Car Co., 240 N. George St., York, Pa.

O'Connor, W. F.—Clap and Church Sts., Woodstock, Ill. Garage.
Oddie, T. L.—Pres. Lothrop Davis Co., 105 Main St., Tonopah, Nev.
Odell Electric Co.—Odell, Ill. Garage.
Odell, R. L.—156 W. 39th St., New York City. Garage.
Oden Auto Co., J. P.—26 W. Philadelphia St., York, Pa. (Mitchell.)
Odometer.—An apparatus for counting the revolutions of a wheel, and, thereby, the distance traveled.
Odor Akkumulatoren und Elementefabrik.—Schkenditz 2, bei Leipzig, Germany. Mfrs. storage batteries.
Odontograph.—An instrument used in drawing the form of gear-wheels.
Oelschlager Bros.—42 E. 23rd St., New York City. Mfrs. eye shields.
Oesterreicher Daimler Motoren Gesellschaft.—Wiener, Neustadt, Austria. Mfrs. gasoline automobiles. (Daimler cars.)
Oesterreichisch-Amerikanische Gummi-fabric Breitensee.—Hütteldorfer strasse 74, Vienna, Austria. Mfrs. pneumatic tires.
Oesterreichische Maschinen Actiengesellschaft.—Vienna, Austria. Mfrs. automobile motors.
Oestmann, Jacob L.—Treas., J. S. Kirk & Co., 360 N. Water St., Chicago, Ill.
Oettinger, M. O.—Vice-Pres., Rock Island Battery Co., 9th and Sycamore Sts., Cincinnati, O.
O'Farrell, C. T., Jr.—Dillon, S. C. Garage.
Off & Co., Christian.—Indianapolis, Ind. Mfrs. dashes and fenders, hoods, tanks and glass wind shields.
Ofeldt & Sons, August.—123 Liberty St., New York City. Mfrs. body irons, gasoline and kerosene burners, and boiler pumps.
Ofeldt & Sons, F. W.—Nyack on the Hudson, N. Y. Mfrs. steam automobile specialties, safety water tube boilers, kerosene blue flame burners, automatic field regulators, automatic water regulators, feed water heaters, compound steam engines, and automatic fuel feed. Garage.
Offenbacher, A. B.—525 Third St., Marietta, O. (Pope-Waverley.)
Official A. A. A. Blue Book Station.—Concord, N. H. Supplies, garage and repairing.

Official Automobile Blue Book.—Flat-iron Bldg., New York City. Pubs. road maps.

Official Auto Repair Co.—11 Eldridge Court, Chicago, Ill. Repairing.

Officina Archimede.—57 Via Flaminia, Rome, Italy. Mfrs. gasoline automobiles (Archimede cars).

Officina San Giorgio.—Via Valperga Caluso, Turin, Italy. Mfrs. lubricators.

Officine Canavesio, Carello, Societa Anonima.—15 Corso Brescia, Turin, Italy. Mfrs. horns, acetylene lamps.

Officine di Sesto San Giovanni, Camona e Cie.—5 via Spontini, Milan, Italy. Mfrs. electric automobiles.

Officine Türckheimer.—4, via Lambro, Milan, Italy. Mfrs. spark plugs, and radiators.

Offset.—A term applied to the cylinders of a motor which are slightly out of line with the crank-centers. The effect of such an arrangement is to diminish the pressure exerted by the piston upon the walls of the cylinders at the time of the expansion (or so-called "explosion"). (2) A subsidiary wire or cable leading from a main point to a point where current is required.

Offset Glass.—A glass lubricator-cup flattened on one side for closer application.

Offset Handle Wrench Co.—123 La Salle St., Chicago, Ill. Mfrs. wrenches.

Ogden & Co., E. C.—Alexander House, 56a Ludgate Hill, London, E. C., England. Mfrs. spark plugs.

Ogden Automobile Co.—24th St., Ogden, Utah. Garage.

Ogden, D.—332 Fifth St., Columbus, Ind. (Reo, Jackson, Wayne, Haynes). Est. 1898. Garage, 40 cars; repairing; vulcanizing.

Ogden, Henry D.—Treas. J. M. Quinby & Co., 21-39 Division St., Newark, N. J.

Ogden, W. W.—Pres. and Gen. Mgr. J. M. Quinby & Co., 21-39 Division St., Newark, N. J.

Oger et Guérin.—36 rue Godefroy-Cavaignac, Paris, France. Mfrs. lubricators.

Ohenemus, R., & Acrey, C. M.—Carlsbad, New Mexico. (Holsman.)

Ohio Automobile Club.—Akron, O. Fred Work, Sec.

Ohio Blower Co., The.—330 Prospect Ave., N. W., Cleveland, O. Mfrs. hoods, bonnets, drip pans, fenders, tanks, guards, seats, bodies, brazed and bent tubing, and sheet metal parts. Est. 1902. D. K. Swartwout, Pres. and Treas.; J. D. Swartwout, Vice-Pres.; Edward Covey, Mgr., and H. H. Lind, Sec.

Ohio Brass Co.—Mansfield, O. Mfrs. brass, bronze, aluminum and copper castings, gasoline tank gauges, adjustable lamp brackets, lubricators, oil pumps, and steering apparatus.

Ohio Carriage Body Co.—Bellefontaine, O. Mfrs. wood and metallic bodies.

Ohio Electric Works.—6304 Ellen Ave., N. W., Cleveland, O. Mfrs. igniting dynamos, coils, electric flash lights and lanterns, etc. Est. 1876. A. C. Fletcher, owner and manager. J. J. Finsterwald, Foreman.

Ohio Motor Car Co.—2142 E. 9th St. S. E., Cleveland, O. (Buick, Columbia, Waltham, and Haynes.)

Ohio Pail Co.—Middlefield, O. (Monarch.)

Ohio Scroll & Lumber Co.—Covington, Ky. Mfrs. wood and metallic bodies, and wood panels.

Ohio State Automobile Association.—Cleveland, O. F. T. Sholes, 528 Garfield Bldg., Cleveland, O., Pres.; C. Gordon Neff, Cincinnati, O., 1st Vice-Pres.; G. E. Mentel, Springfield, O., 2nd Vice-Pres.; A. L. Garford, Elyria, O., 3rd Vice-Pres.; Walter C. Baker, Cleveland, O., 4th Vice-Pres.; Henry H. Hower, 3500 Euclid Ave., Cleveland, O., Sec.; L. S. Colter, Cincinnati, O., Treas. Membership: Akron Club, Automobile Club of Cincinnati, Cleveland Automobile Club, Elyria Automobile Club, Lima Automobile Club, Springfield Automobile Club, and Youngstown Automobile Club.

Ohio Valley Automobile Club.—R. H. Mahlke, Sec. Wheeling, W. Va.

Ohio Valley Auto Co.—3 Main St., Greenup, Ky. (Rambler.) Est. 1903. Elwood Kinner, Gen. Mgr. Proprietors: Elwood Kinner and John D. Kinner. Repairing.

Ohler, J. O.—Lima, O. (Mitchell.)

Ohm.—In electricity, the "ohm" is the unit of resistance. It is the resistance which is offered at 32° F. or 0°C. by a column of mercury 106.3 mm. long and 1545 grammes in weight, or practically by a copper wire 1 mm. in diameter and 50 metres long.

Ohm-cm.—An abbreviation of "ohm centimetre."

Ohmic.—Due to, or relating to, resistance (q. v.). Thus, "ohmic loss" is the energy lost in a circuit through the resistance of the conductors.

Ohm, Law of.—The intensity, *I*, of the electric current in a conductor is proportional to the difference of potential, *U*, at its extremities and inversely proportional to the resistance, *R*, of the conductor.

$$I = \frac{U}{R}$$

If the difference is given in volts, and the resistance in ohms, the intensity is given in amperes.

Ohmacht, L. W.—Cresco, Ia. (Holsman.)

Ohmmeter.—An instrument for the commercial measurement of resistance.

Ohnhaus Automobile Co.—219 Pearl St., Fort Wayne, Ind. (Buick, Oldsmobile, Jackson.)

Ohnsted, E. B.—Sec. and Sales Mgr. Autocar Equipment Co., 77-79 Edward St., Buffalo, N. Y.

Oil, Castor.—An oil obtained from the seeds of *Ricinus communis*. It is used in the manufacture of lubricants and for dressing leather. It is employed on automobiles as an application to the leather facings of clutches that are too "fierce."

Oil, Cotton-seed.—An oil expressed from the seeds of various species of cotton. It is used, among other purposes, for quenching steel. See Quench.



Oil-cup.—A cup-like lubricating device (see figure) mounted on or connected with a

bearing for feeding lubricant to it.

Oil-gas.—See Gas, Oil.



Oil-grooves.—Cruciform grooves formed in the interior of a bearing and designed to distribute oil around a shaft rubbing in a bearing. Such grooves are indispensable to a proper oiling and should be kept in a perfect state of cleanliness

Oil-gun.—See Gun, Oil.

Oil-hardening.—See Hardening, Oil.

Oil, Linseed.—An oil expressed from the seed of the flax plant, *Linum usitatissimum*. It is used commercially, both in a raw and boiled state, in the manufacture of paints. In motor-car work, boiled linseed-oil is employed for making joints between metal surfaces which need to be gas or water-tight. Thus, heavy paper, cardboard or asbestos paper saturated with it will form a perfectly tight or air-joint.

Oil, Lubricating.—Any non-drying oil, animal, vegetable or mineral, which is suitable for oiling machinery.

Oil, Mineral.—An oil, usually a distillate of petroleum, used for lubricating, heating and illuminating purposes or for the production of a gaseous mixture for internal combustion-motors. See Petroleum, Naphtha, Kerosene, Paraffine, Petrol, Gasolene.

Oil of Vitriol.—A common name for sulphuric acid.

Oil-pump.—See Pump, Oil.

Oil-ring.—See Lubrication.

Oil-stone.—A stone of fine grain employed for setting or finishing the cutting-edge of tools. The best known varieties are the Turkey, Arkansas and Washita.

Oil-tank.—See Tank, Oil.

Oiler, Chain.—See Lubrication.

Oiler, Drop.—See Lubricator, sight-feed.

Oiler, Ratchet-feed.—A mechanical lubricator in which the piston-cams are operated by means of a pawl and ratchet-wheel, through a connecting-rod attached to some reciprocating part of the motor or to a crank on the end of a cam-shaft. Such oilers are not suitable for motor-speeds of over 600 r. p. m.

Oiler, Sight-feed.—See Lubricator, Sight-feed.

Oilers.—See Lubricators.

Oil City Oil and Grease Co.—Oil City, Pa. Jobbers in lubricating oils and greases, gasolenes, naphthas, illuminating oils. Est. March, 1906. S. N. Moyar, Pres.; H. R. Merriitt, Treas.; C. P. Grunden, Mgr.

Oil Tempering Spring Co.—Chicopee Falls, Mass. Mfrs. shock absorbers.

O'Kane, Co., J.—528 Golden Gate Ave., San Francisco, Cal. Supplies.

Okey Motor Car Co.—Succeeding Okey Auto Co., W. Broad and Kimball sts., Columbus, O. Makers of the Okey car; first marketed in 1902. Nine different models made since. Cap. \$25,000. C. M. Crittenden, Pres.; H. T. Stewart, Vice-Pres.; F. R. Shinn, Treas.; H. E. Walton, Sec. and Gen. Mgr.; Perry Okey, Designer and Supt.

Okey, Perry.—Designer and Supt. Okey Motor Car Co., W. Broad and Kimball Sts., Columbus, O.

Oklahoma Automobile Co.—806 Broadway, Enid, Okla. (Cadillac, American.)

Oklahoma Motor Car Co.—515 W. Main St., Oklahoma City, Okla. (Rambler, Ford, Pope-Waverley, Reliance, Mason and American.)

Okonite Co.—253 Broadway, New York City. Mfrs. insulated wires.

Olcott, Ralph Thrall.—Automobile Editor Post Express. B. Chicago, Ill., Nov. 13, 1861. Ed. Union Academy, East Aurora, New York; University of Rochester, 1887. Address, care Post Express, Rochester, N. Y.

Old Colony Light Co.—Motor Mart, Boston, Mass. Mfrs. acetylene tanks.

Oldfield, Barney.—First and most famous of American track racing drivers. Came into prominence at the Detroit race meet in 1902, where he drove the "999," the car without a differential, designed and built by Henry Ford. Afterward drove a Winton and Peerless cars, making many records during 1903, 1904 and 1905.



Oldfield, J. & R.—Warwick St., Birmingham, England. Mfrs. electric lamps.

Oldham Coupling.—See Coupling, Oldham.

Olds, Arthur L.—Charles City, Ia (Jackson).

Olds, H. B.—315 Columbia St., Fort Wayne, Ind. (Stearns).

Oldsmobile Co.—1010 Prospect Ave., Cleveland, O.; 1328 Michigan Ave., Chicago, Ill.; 1653 Broadway, N. Y. (Oldsmobile.)

Olds Motor Works.—Lansing, Mich. Makers of the Oldsmobile; first marketed in 1901. Twenty models, including commercial cars, made since. Cap. \$2,000,000. Henry Russell, Pres.; Frederick L. Smith, Vice-Pres. and Gen. Mgr.; Angus Smith, Sec. and Treas.; George W. Dunham, Designer; G. B. Burwell, Supt.; R. B. Jackson, Purch. Agt. and Factory Mgr.; W. E. Stokes, Sales Mgr. Branch, Packard Electric Co., St. Catharines, Ont.

Olds, Ransom E.—Pres. and Mgr. Reo Motor Car Co. Born Geneva, O., June 3, 1864. Educated



Cleveland and Lansing. Director Atlas Drop Forge Co., Mich. Screw Co., National Coil Co., Inter Ocean Mining Co., Bancroft Co., Pres. Capital National Bank, Grand Sedge Clay Products Co. Mem. A. C. of Detroit, A. C. Buffalo

Res. 720 Washington Ave., Lansing, Mich. Office, Reo Motor Car Co., Lansing, Mich. In trade since 1896. Used first car in 1886

Olds, W. H.—Sec. and Treas. Fort Wayne Gear Co., North American Bldg., Ft. Wayne, Ind.

Olean Garage Co.—481 Union St., Olean, N. Y. Garage.

O'Leary, J. W.—Sec. and Treas. U. S. Jack Co., 128-30 W. Lake St., Chicago, Ill.

Olewine, B. J.—Newcastle, Brunswick, Ga. (Pope-Hartford.)

Olive Auto Co.—3970 Olive St., St. Louis, Mo. Garage

Oliver, A. J.—Pres. U. S. Jack Co., 128-30 W. Lake St., Chicago, Ill.

Oliver Electric Vehicle Co.—1737 12th St., Cleveland, O. Garage.

Oliver Instrument Co.—Cor. Hennepin and 7th Sts., Minneapolis, Minn. Mfrs. speedometers.

Oliver Manufacturing Co.—248-250 S. Desplaines St., Chicago, Ill. Mfrs. jacks and screw jacks. Est. 1891. Inc. 1898. Mem. M. & A. M.

Oliver, S. C.—29 W. Forsythe St., Jacksonville, Fla. (Ford.)

Olmstead & Co., H. B.—663 Manhattan Ave., Brooklyn, N. Y. Mfrs. patterns.

Olmsted & Son, H. R.—413 S. Clinton St., Syracuse, N. Y. Mfrs., dealers and jobbers automobile tires and supplies. Est. 1854. Geo. L. De Lany, Mgr. Garage. (Indian.)

O'Loughlin, Colman S.—Secy. Treas. and Direc. The Breeze Carbureter Co., 276 Halsey St., Newark, N. J.

O'Loughlin, M. R.—Direc. The Breeze Carbureter Co., 27 Halsey St., Newark, N. J.

O'Loughlin, R. S.—Direc. The Breeze Carbureter Co., 276 Halsey St., Newark, N. J.

Olsen, Oscar L.—Lincoln, Neb. (Waltham)

Omaha Auto Tire Co.—2210 Farnam St., Omaha, Neb. Garage.

Omnia.—Pub. at 20 rue Duret, Paris, France

Omnibus.—A closed carriage, having a seat in front, and, in the interior, a seating capacity for a considerable number, access being gained by a rear door. The number of seats and windows is variable. The two seats inside are arranged so as to face each other, and are parallel with the major axis of the car. An omnibus is a closed "break"

Omnibus-bar.—See Bus-bar.

Oneida Automobile Club.—Oneida, N. Y. L. C. Stone, Sec.

Oneida Rubber Tire Works.—Oneida, N. Y. Mfrs. solid tires

O'Neill's Automobile Station.—574 Common St., Lawrence, Mass. (Premier, Ford.) Est. 1902. John E. O'Neill Pres. and Treas. Garage, 40 cars. Repairing.

O'Neill & Bros., A. A.—City Hall Ave. and Randolph St., Norfolk, Va. (Ramblers)

O'Neill, I.—Vice-Pres. Mica Mfg. Co., 307 W. Broadway, New York City.

O'Neill, John A.—Pres. Mica Mfg. Co., 307 Broadway, New York City.

O'Neill, John E.—Pres. and Treas. O'Neill's Automobile Garage Co., 574 Common St., Lawrence, Mass.

One Lever Control.—A system of control by which all such operations as steering, braking and varying the speed are controlled by a single lever.

Oneonta Automobile Garage.—23 Dietz St., Oneonta, N. Y. (Haynes, Waltham, Oldsmobile.)

Onland Vander Kasteels.—Utrecht, Holland. Mfrs. make and break plugs and coil.

Onondago Garage.—54 S. Clinton St., Syracuse, N. Y. (Pope-Hartford.) Incorporators, Grove E. Warner and William H. Bex.

Ontario Garage Co.—103 W. 2nd St., Oswego, N. Y. Garage.

Opel, Adam.—Russelsheim-am-Main, Germany. Mfrs. gasoline automobiles and motorcycles (Opel).

Open Circuit.—An interrupted or broken circuit.

Open-hearth Process.—A process for the production of steel from pig iron in a reverberatory furnace, as distinguished from the cementation or Bessemer process, q. v. See Steel.

Opp Hardware Co.—Otterbein, Ind. (Lambert.)

Ophthalmoscope Co.—Toledo, O. Mfrs. eye shields.

Orange Auto Garage.—Essex Ave. and R. R. Pl., Orange, N. J. (Franklin, Pope-Hartford, Pope-Toledo.)

Orange County Garage.—W. Center St., Anaheim, Cal. Garage.

Orange Valley Garage.—948 Main St. Riverside, Cal. (Reo, Jackson, Royal.)

Orey Janssen Automobile Co.—310 Main St., Davenport, Ia. (Mitchell.)

Orford Copper Co.—43 Exchange Pl., Reading, Pa. Mfrs. chrome-nickel steel.

Orient Buckboard Supply Co.—110 Park St., Albion, Mich. (Waltham.)

Orient Mfg. Co.—537 Albany St., Boston, Mass. Mfrs. "Waltham Spray" and washing apparatus. Cap. \$500,000. Est. 1901. Irving L. Drake, Pres.; Wilton E. Drake, Treas. and Sec.

Oriental Rubber Co.—1140 Bedford Ave., Brooklyn, N. Y. Vulcanizing.

Oriental Varnish Co.—72 Midwood St., Brooklyn, N. Y. Mfrs. varnishes.

Orlando-Kessler Automobile Co.—36 W. Capitol St., Columbus, O. (Lozier.)

Ormond Automobile Co.—2 Jefferson Ave., Brooklyn, N. Y. (Columbia.) Est. 1903. Garage, 60 cars. Repairing.

Ormond Beach Garage.—Ormond, Fla. (Cadillac.)

Oswell Ignition Co.—102 Pearl St., Boston, Mass. Mfrs. spark plugs.

Orthopter.—See Aviation.

Osborne, C. H.—405 S. Superior St., Albion, Mich. (Rambler, Waltham, Queen.)

Osborne, C. H.—Head of Machine Dept. The Chandler Co., 31 Taylor St., Springfield, Mass.

Osborne Pole & Shaft Co.—Anderson, Ind. Mfrs. jacks.

Osbun, A.—Mgr. Osbun Iron Works, 113-119 W. Central Ave., Redlands, Cal.

Osbun Iron Works.—113-119 W. Central Ave., Redlands, Cal. (Tourist.) Est. 1904. Cap. \$20,000. A. Osbun, Mgr. Garage, 25 cars. Repairing.

Osburn's Sons, J. F.—Clarksburg, W. Va. (Cadillac.)

Oscillation.—A general term for a to-and-fro motion, however produced.

Osen, Geo. H.—Pres. Osen Hunter

Automobile Co., 407 Golden Gate Ave., San Francisco, Cal.

Osen Hunter Automobile Co.—407 Golden Gate Ave., San Francisco, Cal., and 50 W. St. John St., San Jose, Cal. (Mitchell.) Cap. \$50,000. Geo. H. Osen, Pres. and Mgr. San Jose; A. E. Hunter, Vice-Pres. and Mgr. San Francisco; A. D. Curtner, Sec. Repairing.

Osgood, E. M.—Asst. Supt. Babcock Electric Carriage Co., 226-242 W. Utica St., Buffalo, N. Y.

O'Shea, Thos. H.—Treas. T. Aiton Bemus Co., Inc., 358 Atlantic Ave., Boston, Mass.

Oshkosh Automobile Club.—Oshkosh, Wis. F. E. Waite, Sec.

Oshkosh Boat Works.—Oshkosh, Wis. Mfrs. motor boats.

Oshkosh Malleable Iron Co.—Oshkosh, Wis. Mfrs. malleable iron castings, and spark coils.

Osmiridium.—An alloy consisting chiefly of iridium and osmium with small amounts of the other platinum metals and iron or copper.

Osmium.—A bluish-white metal of the platinum group; infusible in anything but the electric arc. Its specific gravity is 22.5—that is to say, it is the heaviest metal known. It enters into the composition of the platinum alloy for catalytic ignition, and is used for forming filaments for the "osmium lamp."

Ostdeutscher Verein für Luftschiffahrt (Graudenz Aero Club.)—Graudenz, Germany.

Osterloh, A. F.—Treas. Chicago Tire Club, Chicago, Ill.

Ostlund's Garage & Machine Shop.—1320 4th Ave., Moline, Ill. (Maxwell.)

Oswald Motor Co.—Goshen, Ind. Mfrs. gasoline automobile motors, and gasoline marine motors.

Oswego Automobile Club.—Oswego, N. Y. N. L. Bates, Sec.

Otis, E. J.—Vice-Pres. Utica Motor Car Co., 333 Bleeker St., Utica, N. Y.

Otis Elevator Co.—Railway Exchange, Chicago, Ill. Mfrs. elevators for garages.

Otis Steel Co.—Cleveland, O. Mfrs. steel castings.

Ott, Andrew.—Vice-Pres. C. A. Coey & Co., 1424 Michigan Ave., Chicago, Ill.

Ottawa Garage & Cycle Co.—Ottawa, Ill. Garage.

Otting, Geo.—Pres. The John Steptoe Shaper Co., 2961 Colerain Ave., Cincinnati, O.

Otto Cycle.—See Cycle, Otto.

Otto Gas Engine Works.—33rd and Walnut Sts., Philadelphia, Pa. Mfrs. gasoline automobile motors, and gasoline marine motors.

Our Own Mfg. Co.—568-74 Broadway, New York City. Mfrs. miscellaneous wearing apparel.

Outboard.—Situated on the outside of a boat. See Inboard.

Outcalt Mfg. Co.—Spotswood, N. J. (Dragon.)

Outer Casing.—Of a pneumatic tire, the external part, or "shoe," as distinguished from the inner tube. See Tube, Inner.

Outer-gap.—The same as "spark-gap" or "spark intensifier," q. v.

Outing Automobile Co.—Flatbush and Ocean Aves., Brooklyn, N. Y. Garage.

Outing Boat Co.—Marquette Bldg., Chicago, Ill. Mfrs. motor boats.

Outing Boat Co.—Kankakee, Ill. J. C. Burrell, Gen. Mgr. and Designer, and F. E. Merrifield, Sales and Advt. Mgr.

Outlook Motor Co.—102 W. 107th St., New York City. Garage.

O-U-T-O-Co.—19 Camfield St., Newark, N. J. Mfrs. Oils.

Output.—The energy developed in a given time by any prime mover or source of energy.

Outside Caliper.—See Caliper.

Overflow-pipe.—See Pipe, Overflow.

Overhang.—An overhanging portion of a structure. (2) The amount or degree of projection.

Overhead Camshaft.—See Camshaft, Overhead.

Overheating.—The overheating of a motor, a trouble which occasionally occurs, may be due to one of three causes: (1) Too rich a mixture and the consequent production of a gas that burns both during the power and exhaust stroke; (2) an inadequate supply of lubricating oil, and the cylinder for that reason becoming heated through excessive friction; and (3) poor circulation and a consequent accumulation of mineral matter in the water-jacket and radiator.

Overland Automobile Co.—Standard Ave. and Division St., Indianapolis, Ind. Mfrs. gasoline automobiles.

Overland Motor Car Co.—1333 Broadway, Denver, Col. (Cartercar.)

Over-lap.—The amount by which two plates cross each other, at a riveted joint, etc.

Overman, Albert H.—Pres. Manly Drive Co. B. Illinois, March 21, 1850. Ed. Illinois State Normal University. Director Manly Drive Co. Mem. A. C. A. Res., 391 West End Ave., New York City. Office, Whitehall Bldg., New York City. Interested in power transmission. Recreations: Shooting, swimming, horse-back riding. Used first car 1897.

Overman, W. C.—Sec. Greene Motor Car Co., 88-90 Washington St., Newark, N. J.

Overa, C. E.—2nd St., Ashland, O. (Ford, Mitchell.)

Overton, L. W.—Traveler St., Southold, N. Y. (Waltham.)

Ovington, Earle L.—Gen. Mgr. Ovington Mfg. Co., 2208 Broadway, New York City.

Ovington Mfg. Co.—2208 Broadway, New York City. (F. N. Four-cylinder Motorcycles.) Est. November, 1905. Cap. \$10,000. Earle L. Ovington, Pres., Gen. Mgr. and Purch. Agt.; M. A. Power, Treas.; G. A. Neuman, Vice-Pres.; A. J. F. Piel, Sales Mgr.

Owen & Co., R. M.—1344 Michigan Ave., Chicago, Ill., 1759 Broadway, New York City, and Lansing, Mich. (Reo, Premier.)

Owen, H. F.—Delaware, O. (Cameron.)

Owen, Percy, Inc.—1876 Broadway, New York City. (Bianchi.) Est. 1907. Cap. \$50,000. Percy Owen, Pres. and Mgr. Repairing. Bianchi cars only.

Owen, Percy.—Importer Bianchi car. B. Oswego, New York, Jan. 19, 1875. Ed. public and high schools. Director

Percy Owen, Inc., New York School Auto Engineers, Sports, Ltd., Importers Automobile Salon. Pres. N. Y. Automobile Trade Ass'n. Mem. A. C. A. Res., 21 Fort Washington Ave. Office, Broadway and 62nd St., New

York City. In the trade since 1899 (Winton Motor Carriage Co.), first gasoline car salesroom in New York City. Mgr. Winton Motor Carriage Co. six years.

Owen, R. M.—Sales Mgr. Reo Motor Car Co., Lansing, Mich.

Owen, Thos. G.—379 Thomas St., Newport, R. I. (Rambler.)

Owens & Co., A. N.—1307 Morton St., Baltimore, Md. Garage.

Owensboro Automobile Co., Inc.—Frederica and 4th Sts., Owensboro, Ky. (Columbia, Ford.)

Oxford Automobile Co.—North Canal St., Oxford, N. Y. Garage.

Oxford Auto Station.—Lynn, Mass. (Winton.)

Oxnard Garage & Machine Shop.—5th St., Oxnard, Cal. Garage.

Oxygen.—A faintly blue odorless gas. Symbol O, and atomic weight 16. It is universally diffused through nature, in a free state; in combination with nitrogen and constituting the atmospheric air; and in combination with hydrogen forming water (H₂O), or with metals or metalloids constituting the earth's crust. It is the active agent in all industrial combustions.

Ozokerite.—See Ceresine.



P

π .—Symbol used for the ratio of the circumference to the diameter of a circle; the number 3.1416.

P.—Symbol for "power."

p.—Symbol for "pressure."

p. d.—Symbol for "potential difference."

Pb.—Symbol for "lead."

Pt.—Symbol for "platinum."

Pacaud et G. Hamon.—66 rue du Bois, Levallois, Seine, France. Mfrs. leather tires, non-skids.

Pacific Automobile Co.—1028 S. Main St., Los Angeles, Cal. (De Luxe, Queech, Overland.)

Pacific Coast Automobile Co.—1414-1416 Broadway, Seattle, Wash. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Thomas Flyer, Thomas Detroit, Buick, Oldsmobile.) Est. Sept., 1906. Cap. \$25,000. E. P. Gaffney, Pres.; Geo. B. Lamping, Sec. and Treas.; E. W. Swanbrough, Gen. Mgr. Garage, 150 cars. Repairing.

Pacific Commerical Car Co.—Seattle, Wash., and 8th and Pacific Ave., Tacoma, Wash. (Cartercar.) Cap. \$25,000. Incorporators: E. R. Wheeler, L. E. Younie, Albert Armstrong. L. E. Younie, Mgr. Tacoma branch.

Pacific Iron Works, Inc.—Bridgeport, Conn. Mfrs. gray iron castings, malleable iron castings, machine work to order.

Pacific Motor Car Co.—376 Golden Gate Ave., San Francisco, Cal., 1416 Broadway, Oakland, Cal. (Stevens-Dur-yea, Woods.)

Pacific Motoring.—835 S. Spring St., Los Angeles, Cal. Pub. weekly by Chas. Fuller Gates.

Pacific Tucking & Mfg. Co.—471-73 18th St., Brooklyn, N. Y. Mfrs. P. T. C. power tire pumps. Supplies. Est. '1883.

Packard Auto Renting Co.—1499 Broadway, New York City. Garage.

Packard, Chas. A.—Townsend, Mass. Repairing.

Packard Electric Co.—399 North Ave., Warren, O. Mfrs. insulated wire.

Packard Garage.—162½ W. 46th St., New York City. Garage.

Packard, J. E.—Augusta, Me. (Cadillac.)

Packard, J. W.—Pres. Packard Motor Car Co., Detroit, Mich.

Packard Motor Car Co.—1861 Broadway, New York City. (Packard.) W. A. Brush, Mgr. Garage, 300 cars.

Packard Motor Car Co.—Detroit, Mich. Makers of the Packard car; nine models marketed to date. Cap. \$1,000,000. J. W. Packard, Pres.; R. A. Alger, Vice-Pres.; P. H. McMillan, Sec. and Treas.; Henry B. Joy, Gen. Mgr.; Russell Huff, Designer; W. I. Gleason, Supt.; F. R. Humpage, Purch. Agt.; S. D. Waldron, Sales Mgr.; L. W. Conkling, Assistant Sales Mgr.. Branch: 61st St. and Broadway, New York City. Agents and dealers: Abbott Cycle Co., 702 Baronne St., New Orleans, La.; Avery, F. E., 1199 Franklin St., Columbus, O.; Bilz, Chas., 1432 Court Pl., Denver, Colo.; Bousfield, C. J., Bay City, Mich.; Broadway Auto Co., Broadway and Madison St., Seattle, Wash.; Brown, Thompson & Co., Hartford, Conn.; Cia Pan Americana de Vehiculos, S. A., Box 966, Mexico City, Mex.; Chicago Motor Car., 1615-17 Michigan Ave., Chicago, Ill.; Childs & Co., C. H., 12-18 Lafayette St., Utica, N. Y.; Cuyler, Lee, 453 Golden Gate Ave., San Francisco, Cal.; Dominion Automobile Co., Toronto, Ont., Can.; Flint Motor Car Co., 212 Union St., Providence, R. I.; Fuller, Alvan T., Motor Mart, Park Sq., Boston, Mass.; Halsey Auto Co., 3914 Olive St., St. Louis, Mo.; Imperial Motor Co., 887 Main St., Buffalo, N. Y.; Joy, C. P., Auto Co., 368 Minnesota Ave., St. Paul, Minn.; Ketchum, J. A. P., Saratoga Springs, N. Y.; Keystone Motor Car Co., 238 N. Broad St., Philadelphia, Pa.; Mar-Del Mobile Co., Charles St. and Mt. Royal Ave., Baltimore, Md.; Moriarity & Co., E. P., 1612 Grand Ave., Kansas City, Mo.; Nute & Keena, Seattle, Wash.; Pacific Motor Car Co., 376 Golden Gate Ave., San Francisco, Cal.; Packard Motor Car Co. of New York, 1540 Broadway, New York City; Pence Auto Co., 717 Hennepin Ave., Minneapolis, Minn.; Rochester Auto Co., 150 South Ave., Rochester, N. Y.; Standard Auto Co., 5917 Baum St., Pittsburg, Pa.; Standard Auto Co., 1206 Huron Rd., S. E. Cleveland, O.; Standard Auto Co., Woodward Ave. and Alexandrine St., Detroit, Mich.; Terre Haute Automobile Co., Terre Haute, Ind.; Welch Bros. Motor Car Co., Grand Ave. and 7th St., Milwaukee, Wis.; Western Motor Car Co.,

Los Angeles, Cal.; Willard Co., H. J., 18 Forest Ave., Portland, Me.

Packing.—Any material employed for making a tight joint, such as asbestos, fiber, hemp, brown paper soaked in boiled oil, red lead, white lead, etc.

Packing, Asbestos-wick.—See Asbestos.

Packing, Fiber.—Long shreds of fiber wound round the plunger of a pump or piston of a steam-engine to form a water-tight joint.

Packing, Hemp.—A packing composed of hemp impregnated with tallow or thick lubricating grease, and used for filling stuffing-boxes.

Packing, Metallic.—Metal blocks held tight against a revolving or reciprocating part by means of springs. The piston-rings of a motor are a form of metallic packing.

Packing, Paper.—A packing consisting of brown paper soaked in boiled linseed oil.

Packing-ring.—The same as Piston-ring, q. v. (2) A copper asbestos washer for a spark-plug.

Packing, Rubber.—A packing consisting of asbestos impregnated with India rubber, and employed for forming water-joints.

Packing House Equipment Co.—Euclid Ave., Upland, Cal. Garage.

Paddock, W. H.—Holdredge, Neb. (Maxwell.)

Padgett, J. M.—Topeka, Kan. (Pope-Waverley.)

Pad, Spring.—See Spring-seat.

Page & Co., Carl.—Newark, N. J. and Bridgeport, Conn. (Peerless.) Harry Unwin, Mgr., Bridgeport Salesrooms.

Page & Co., W. A.—220 Elliot St., Boston, Mass. (Simplicity.)

Page, Carl Henry.—Automobile dealer. B. Worcester, Mass., Jan. 16, 1880. Ed. public and high school. Pres. and Director Henry D. Temple Electric Co., Carl Page & Co., Director Pyramid Motor



Co., The Why Dairy Lunch Co. Mem. A. C. A., L. I. A. C., N. Y. Athletic, The Lambs, Worcester A. C., N. Y. Motor, Crescent Athletic, Aero. Res. 250 W. 93rd St., New York City. In the trade since Nov., 1900.

Used first car

in 1902. Made first long distance automobile trip in America, New York through Pennsylvania and return, 850 miles, in 1900. First automobilist to take a car

around world in 1903. Recreations: Fishing, camping and out-of-door sports.

Page Engineering Co.—Baltimore, Md. Mfrs. gasoline marine motors.

Page Gas Engine Co.—Adrian, Mich. Mfrs. gasoline automobiles.

Page, I. H.—Pres. and Treas. Stevens-Duryea Co., Chicopee Falls, Mass.

Page, Sewell, Jr.—Waverley, Ia. Garage.

Pagel, Dr. C. M.—St. Paul, Ind. (Holsman.)

Paige Electric Co.—238 Main St., Worcester, Mass. Garage.

Paige, E. W.—46 Washington Ave., Batavia, N. Y. (Ford.)

Paige, Fred O.—Pres. Reliance Motor Car Co., 89 Fort St. E., Detroit, Mich.

Paige, M. M.—302 Highland Drive, Seattle, Wash. (Lambert.)

Paige-Storms Drop Forge Co.—Chicopee Falls, Mass. Mfrs. drop forgings.

Paige, Walter M.—131 Cass St., Traverse City, Mich. (Maxwell.)

Paine, Geo. H.—Sec., Treas. and Mgr. Hydraulic Oil Storage Co., 820 Penobscot Bldg., Detroit, Mich.

Painter, G. W.—Winston, N. C. (Buick.)

Palace Auto Co.—1408-10 Walnut St., Kansas City, Mo. (Pierce Arrow, Oldsmobile, Columbia.) Est. Sept., 1906. Cap. \$75,000. J. P. Batchelor, Pres. and Treas.; Jas. C. Williams, Sec.; Carl J. Simons, Gen. Mgr. Garage, 25 dead storage, 15 live storage. Repairing.

Palace Automobile Station.—32 Hermon St., Worcester, Mass. (Hambler.) Est. 1905. Garage, 25 cars; repairing.

Palace Auto Station Co.—348 Trumbull St., Hartford, Conn. (Thomas, Autocar, Oldsmobile.)

Palace Garage.—540 Washington St., Camden, N. J. (Cadillac, Autocar.)

Palace Garage Co.—214 W. 80th St., New York City. Garage

Palais de L'Automobile.—1778 Broadway, New York City. (Lelaunay Belleville, Renault, Panhard.) Est. 1903. Repairing.

Pales, D. W.—Box 117, Guayama, Porto Rico. (Wayne.) Garage.

Palisade Auto Co.—Palisade Ave. and Hackensack Plank Road, Weehawken, N. J. (Pope-Waverley, Cadillac, Peerless, Pope-Hartford.)

Palis, F. W.—Spring St., Shreveport, La. (Stoddard-Dayton, Buick, Jewel.)

Palmer & De Mooy Foundry Co.—Cleveland, O. Mfrs. gray iron castings.

Palmer & Peck.—Oakland, Ill. (Auburn.)

Palmer & Singer Mfg. Co.—1620-24 Broadway, New York City. (Simplex, P. & S.) Est. January, 1906. Cap. \$100,000. C. A. Singer, Pres.; H. U. Palmer, Vice-Pres. and Treas.; C. A. Singer, Jr., Sec.; A. P. Palmer, Asst. Treas.; Warren

Noble, Mechanical Engineer and Designer; W. H. Botto, Gen. Sales Mgr.; H. C. Spratley, Asst. Gen. Mgr. and head Equipment Dept.; J. F. Gforer, Auditor; J. Mallon, Shop Foreman; B. A. Dreves, Office Mgr.; J. R. Eustis, Advt. Mgr.; Paul Picard, Mgr. Chicago Branch, 1321 Michigan Ave. Garage, 150 cars; repairing.

Palmer & Singer Mfg. Co. of N. Y.—1321 Michigan Ave., Chicago, Ill. (Simplex, P. & S.) Brance est. since November, 1906. Paul Picard, Mgr. Garage, 9 cars; repairing cars represented.

Palmer, A. P.—Asst. Treas. Palmer Singer Mfg. Co., 1620-24 Broadway, New York City.

Palmer Auto Garage.—Palmer, Mass. (Oldsmobile.)

Palmer Bros.—Coc Cob, Conn. Mfrs. gasoline marine motors, motorboats.

Palmer, Frank.—40-56 Jefferson Ave., N., Battle Creek, Mich. (Reo.) Repairing; supplies; garage.

Palmer, Fremont D.—Treas and Gen. Mgr. Martini Import Co. B. New London, Conn., Feb. 17, 1866. Ed. grammar school and academy at Norwich, Conn. Director Martini Import Co. Res., 8 W. 64th St.; office, 239 W. 50th St., New York City. In trade since May 1, 1906. Used first car May

1, 1906. Formerly engineer, commercial business. Recreations, automobiling, fishing.

Palmer, Henry U.—Treas and Vice-Pres. of Palmer & Singer Mfg. Co., Vice-Pres. and Director Brooklyn Elevator & Milling Co., Trustee Williamsburg Savings Bank, Director N. J. & N. Y. Realty & Improvement Co., North Side Park of Brooklyn, Palmer Waterfront Land & Improvement Co., Telluride Reduction Co. Address, 195 N. 9th St., Brooklyn, N. Y., and 1620-24 Broadway, New York City.

Palmer, Henry W.—Sec. and Treas. Jackson Motor Car Co., 103 Court St., Brooklyn, N. Y.

Palmer-Moore Co.—Syracuse, N. Y. Mfrs. gasoline automobile motors.

Palmer, O. F.—Sec. Adrian Steel Casting Co., Beecher St., Adrian, Mich.

Palmer, T. R.—Pres. and Gen. Mgr. Continental Rubber Works, 19th and Liberty Sts., Erie, Pa.

Palmer Tyre Co., Ltd.—119 Shaftesbury Ave., London, W. C., England. Mfrs. pneumatic tires.

Palmer, W. J.—220 W. 10th St., Wilmington, Del. Garage.

Palmetto Metal Co.—586 W. Lake St., Chicago, Ill. Mfrs. babbitt metals.

Palms, Chas. L.—Sec. Treas. and Chairman Board of Directors, Wayne Automobile Co., Piquette and Brush Sts., Detroit, Mich.

Palo Alto Hardware & Improvement Co.—Emmetsburg, Ia. (Waltham.)

Palomo, Domingo.—Calle 64, No. 411, Merida, Yucatan, Mexico. Garage.

Palous und Beuse.—Zimmerstrasse 30, Berlin, Germany. Mfrs. lubricators, differential and steering gears, circulating pumps.

Pan.—A sheet of metal attached to the frame of a motor-car and extending beneath the power-plant and serving to protect it. (2) See Bonnet.

Pan, Dust.—A fabric or metal pan for protecting the motor from mud and dust. See Apron.

Pane.—One of the sides of a nut or bolt-head. (2) The pointed or edged end of a hammer-head, spelled also "pean," "pein," "peen," "pene," "pin," etc

Panhard & Levassor.—1381 Broadway, New York City; 222 Eliot St., Boston, Mass. (Panhard.) Est. 1902. Not inc. A. Massenat, Gen. Mgr.; A. de Magnin, Asst. Mgr. Repairing.

Panhard et Levassor, Société Anonyme des Anciens Établissements.—19 Ave. d'Ivry, Paris, France. Mfrs. gasoline commercial automobiles. (Panhard trucks.) Gasoline automobiles. (Panhard cars.) Marine and automobile motors, shock absorbers.

Panne.—A French term for the spontaneous stoppage of a motor-car without any apparent cause, and, by extension, for the failure of the motor, clutch, transmission, etc., to operate or to operate properly, or for the exhaustion of the fuel-supply. A word, like several other automobile terms, borrowed from maritime language, in which it expresses the situation of a vessel of which the sails and rudder have assumed such a position that she can neither advance nor recede, but simply drifts.

Pantasote.—An artificial leather much employed in automobiles for cushion covering and vehicle tops.

Pantasote Co., The.—11 Broadway, New York City. Mfrs. artificial leathers, cloth and carpet trimmings.

Panther Fahrradwerke, Oscar Vormbaum.—Magdeburg, Germany. Mfrs. motorcycles. (Panther.)

Pantz, Ch.—Pont-a Mousson, France. Mfrs. gasoline commercial automobiles. (Pantz.)

Paper, Emery.—See Emery-paper.

Paper, Garnet.—See Garnet-paper.

Paper, Glass.—A paper similar to em-



ery-paper, but in the manufacture of which finely crushed glass is used instead of emery.

Paper, Litmus.—See Litmus-paper.

Paper-Pole.—A paper showing the positive or negative poles of a battery or accumulator, or the polarity of a conducting wire traversed by a current. This paper is based on the electrolytic reactions of salts and the movements of bases or metals toward the pole. See Paper, Litmus.

Paper, Sand.—See Sand-paper.

Parabolic Reflector.—See Reflector, Parabolic.

Paraffin.—A mixture of solid hydrocarbons or what are called "saturated" hydrocarbons belonging to the fatty series. Paraffin offers a considerable resistance to the most active reagents, such as sulphuric acid, chlorine, etc. It is a remarkable insulator or dielectric. As an insulator it is used in the making of induction-coils. Paraffin which is solid at ordinary temperatures, melts at 122° F., or 50° C.

Paragon Refining Co., The.—Toledo, O. Mfrs. grease, oils, semi-solid oils.

Parallel, In.—In connecting storage-cells to form a battery, when the voltage of one cell is sufficient, and it is desired to increase the volume, or amperage, of the current, the cells are connected "in parallel." This is done by connecting together all of the negative poles by one wire (which is the same as connection "in multiple") and all of the positive poles by another wire, the two wires leading to the circuit. This increases the amperage as many times as there are cells.



together all of the negative poles by one wire (which is the same as connection "in multiple") and all of the positive poles by another wire, the two wires leading to the circuit. This increases the amperage as many times as there are cells.

Parant Frères.—59 rue Chauveau, Neuilly, Seine, France. Mfrs. transmission and steering gears, clutches.

Parcher, L. Herbert.—Gardner, Mass. (Maxwell.)

Pardee & Canary, Inc.—1218 Michigan Ave., Chicago, Ill. (American Mors, Renault, Mora, American.)



St., New York City.

Pardee, K. C.—A New York automobile tradesman, Sec. and Gen. Mgr. of the firm of Maxwell-Briscoe, Inc. He formerly handled the Packard line, but for several years has sold the Maxwell car in New York and vicinity. Address, 317 West 59th

Pardee Works, The C.—Perth Amboy, N. J. Mfrs. steel.

Pardington, Arthur R.—2nd Vice-Pres. and Gen. Mgr. L. I. Motor Parkway, Inc. B. Saginaw, Mich., July 30, 1865. Ed. public and high-schools of Detroit and technical and professional training in New York. Director L. I. Motor Parkway, Inc.; Flagler Co., Inc.; Home Trust Co.; Miller-Yale Co. Mem. L. I. A. C., A. C. A., N. Y. Motor, Crescent Athletic, Tavern, Belle Terre, N. Y. State Auto Association, A. A. A. Charter member of 2nd Naval Battalion, organized 1896. Commissioned as Lieut. and



Paymaster in 1897. Held commission ever since. Held Commission as Asst. Paymaster in U. S. N. in 1898, and served in the Coast Defence District from Block Island to Barnegat. Served in First Regiment C. N. G. 1885-1887. Served on

Staff of 14th Regiment N. Y. N. G. 1889-90. For ten years was director in the Brooklyn Academy of Photography. Is now on the Ex. Committee of the Brooklyn Transit Reform League and Citizens' Central Committee. Chairman of the Vanderbilt Cup Commission 1904 and a member in 1907. Acting Chairman summer of 1907. Ran the first 100-mile endurance run ever held in this country as Chairman of Committee of the Long Island Auto Club. Ran for the Long Island Auto Club the first road races on Coney Island Boulevard Nov. 17, 1901. Res. 224 77th St., Brooklyn; N. Y. Office, 527 Fifth Ave., New York City. Used first car 1901. Recreations: all branches of sports.

Paris Auto Top Co.—236 W. 41st St., New York City. Mfrs. automobile covers, automobile tops.

Paris Fdy. & Machine Works.—Paris, Ill. (Buick, Waltham.)

Parish & Bingham Co.—Cleveland, O. Mfrs. pressed steel products, sprockets.

Parish Mfg. Co.—7th and Chestnut Sts., Reading, Pa. Mfrs. pressed steel frames, stampings, chrome-nickel steel.

Park Auto Co.—893 E. 51st St., Chicago, Ill. Garage.

Park Automobile Co.—2359 Madison Ave., Baltimore, Md. (Frayer-Miller.)

Park Automobile Co.—4432 Olive St., St. Louis, Mo. (Thomas Flyer, Baker, Autocar.)

Park Brew Co.—1100 Elmwood Ave., Providence, R. I. Garage.

Park Circle Garage.—4-8 Ocean Parkway, Brooklyn, N. Y. Garage.

Park City Brass Co.—Springfield, Mass. Mfrs. tire valve and pump connections, nipples.

Park Garage.—Brooklyn, N. Y. (Walter.)

Park Garage.—425 Main St., Chico, Cal. (Ford, Rambler.)

Park Garage Co.—2212-14 Spring Garden St., Philadelphia, Pa. Garage.

Park Garage Co.—210 W. Ohio St., Allegheny, Pa. (Walter, Corbin.)

Park Garage Co. of Pittsburgh, The.—Pittsburg, Pa. Mayor Charles F. Kirschler, Pres.; John Sauers, Vice-Pres.; R. M. Kopp, Treas.; Morris Einstein, Sec.; F. H. Walley, Mgr. Cap. \$25,000. Garage.

Park Hardware Co.—Warren, O. (Jewel.)

Park, J. W.—Fruitland, Fla. (Carter-car.)

Park Sq. Auto Station.—43 Columbus Ave., Boston, Mass. (Stoddard-Dayton, Berliet.) Est. 1903. C. F. Whitney, Treas. and Mgr.; W. B. Buxton, Hd. Garage; W. M. Ferris, Sales Dept.; B. W. Shaw, Repairs. Garage, 150 cars; repairing.

Parker, Albert.—Office Mgr. West Garage, cor. Milton Ave. and Front Sts., Ballston Spa, N. Y.

Parker & Co. Auto Station, D. L.—18 Market St., New Bedford, Mass. (Pope-Toledo, Pope-Hartford.) Supplies, garage, repairs.

Parker & Co., David L.—18 Market St., New Bedford, Mass. (Pope Toledo, Pope Hartford.) Est. Oct., 1904. Harry E. Borden, Mgr.; John W. Cary, Supt. Garage, 35 cars; repairing.

Parker & Co., F. R.—Concord, N. H. (Cadillac.)

Parker & Co., F. R.—288 Columbus Ave., Boston, Mass. (Elmore.)

Parker & Co., W. H.—148 Broadway, Long Branch, N. J. Garage.

Parker, Burton.—Former Adv. Mgr. Fisk Rubber Co. B. Hartford, Conn., June 8, 1869. Ed. Hartford high-school, Trinity College, Post-graduate course Yale University. Mem. Hartford, St. Anthony's, University clubs. Res. 23 Florentine Gardens, Springfield, Mass. In trade since 1897.

Parker Co., J. P.—48 S. 2nd St., Memphis, Tenn. (Stoddard-Dayton.)

Parker Co., J. J.—506 Erie St., Fulton, N. Y. Mfrs. gasoline marine motors.

Parker, E. J.—428 Broad St., Providence, R. I. Garage.

Parker, E. N.—Springfield, Mass. Mfr. nipples.

Parker, F. H.—Gardner, Mass. (Maxwell.)

Parker, L. H.—Sec. and Treas. Lipman Mfg. Co., 300 Pleasant St., Beloit, Wis.

Parker Mfg. Co.—6 Clifton St., Boston, Mass. Mfrs. speedometers.

Parker, N. G.—Treas. Berkshire Cycle & Automobile Co., 95 Main St., North Adams, Mass.

Parker, Robt.—Pres. Western Motor Co., Logansport, Ind.

Parker, Robt.—Remington, Ind. (Waltham.)

Parker, Stearns & Co.—228-29 South St., New York City. Mfrs. tire patches, inner tire tubes.

Parker, Surry.—Pine Town, N. C. Mfr. gasoline engines, steam boilers, gears, iron and brass castings, forgings. Repairing.

Parker, Wm. A.—La Independencia 12, Mexico City, Mexico. (Elmore.)

Parkersburg Auto Co.—607 Julian St., Parkersburg, W. Va. (White, Pope-Waverley.)

Parker's Trinity Square Garage.—428 Broad St., Providence, R. I. Garage.

Parke, E. T.—Fidelity Bldg., Buffalo, N. Y. (Autocar.)

Parkhurst, E. B.—Designer and Supt. Moline Pump Co., Moline, Ill.

Parkhurst, Edwin H.—Vice-Pres. Peerless Motor Car Co. B. Barnard, Vt., April 10, 1872. Ed. Woodstock high school. Director Peerless Motor Car Co. Member clubs: Euclid, Cleveland A. C. (Cleveland), Crescent Athletic (Brooklyn). Res. Hollenden Hotel, Cleveland, O.

Connected with automobile trade since November, 1903.

Parkhurst Mfg. Co.—Peru, Ind. Mfrs. gray iron castings, elevators.

Parkins, Wm.—Chief of Eng. Dept. Rapid Motor Vehicle Co., Pontiac, Mich.

Parkin & Sons.—2417 N. Broad St., Philadelphia, Pa. Garage.

Parks, A. S.—Wichita, Kan. (Locomotive.)

Parkway Garage Co.—110th St. and Central Park W., New York City. Est. since Jan. 1, 1907. Cap. \$4,000. C. Herbert Covell, Pres.; Leslie L. Sanders, Vice-Pres.; Richard H. Fenker, Sec. and Treas.; William G. Feick, Garage Mgr.; Charles W. Sinclair, Hd. Mechanic; Joseph H. Covell, Mgr. Rental Dept. Garage, 125 cars. Repairing, supplies.

Parrish, Lee N.—Pres. Hamilton Motor Car Co., 26 N. 2nd St., Hamilton, O.

Parrot Varnish Co.—Bridgeport, Conn. Mfrs. varnishes.

Parry & Co., A. N.—Amesbury, Mass.



Mfrs. curtain fasteners, top fixtures.

Parsell & Weed.—129-131 W. 31st St., New York City. Mfrs. electric motors, pattern makers.

Parsons Buggy Top Co.—Chicago, Ill. Mfrs. automobile robes, tops, glass wind shields.

Parsons Electric Motor Carriage Co.—Cleveland, O. Mfrs. electric automobiles.

Parsons, F. C.—500 Main St., Stamford, Conn. (Waltham.)

Parsons, Henry B.—Pine St., Stockbridge, Mass. Est. 1906. Garage, 30 cars, repairing.

Parsons, J. C.—410 N. Main St., Rushville, Ind. (Cameron.)

Parsons Non-Skid Co., Ltd.—210 Shaftesbury Ave., London, W. C., England. Mfrs. non-skids.

Parsons, W. G.—Treas. American Metal Polish Co., 89 Winslow Ave., West Somerville, Mass.

Partenheimer, F. A.—Advt. Mgr. Mora Motor Car Co., Newark, N. Y.

Partinium.—An alloy of aluminum, magnesium and tungsten, which, with the lightness of aluminum, combines a resistance varying with the proportions of the alloyed metals.

Melted in sand, its density is 2.89. Its tensile strength is from 17,000 to 24,000 pounds to the square inch, and its elongation is from 12 to 6 per cent., according to the proportions of the magnesium and tungsten employed. When rolled, its density is 3.09, its tensile strength from 46,000 to 53,000 pounds to the square inch, and its elongation from 6 to 8 per cent. Partinium is employed in the automobile industry for making gear castings and sometimes motor-car panels, and has been used to some extent for racing-car bodies.

Partridge, Ernest Samuel.—Vice-Pres. Wyckoff, Church & Partridge. B. Birmingham, England, Apr. 14, 1868. Ed. Birmingham Grammar School. Director Wyckoff, Church & Partridge. Mem. A. C. A. Office, 1743 Broadway, New York. In the trade since 1884. Used first car 1902.

Pasadena Automobile Co.—57 W. Union St., Pasadena, Cal. Garage.

Pasadena Automobile Club.—Robert H. Gaylord, Sec. Pasadena, Cal.

Pasquet.—Ave. Michelet, Salon, Bouc-du-Rhone. France. Mfrs. motor cycles. (Pasquet.)

Pass & Seymour, Inc.—52 Boyd Ave., Solvay, N. Y. Mfrs. electrical specialties, porcelain insulators, porcelain tubes, switches. B. E. Salisbury, Gen. Mgr.; J. W. Brooks, Sales Dept.; L. J. Bergman, Credit Dept.

Passaic Motor Car Co.—147 Main Ave., Passaic, N. J. (Pope-Waverley.)

Passaic Steel Co.—Paterson, N. J.

Mfrs. angle, channel and tee iron and steel.

Paste.—The active material (lead oxide) applied to the surface of plates or grids in a storage-battery. See Cell, Secondary.

Pasted.—A term applied to the electrodes of storage-cells which are built up mechanically instead of being "formed" electrolytically. See Formed, and Cell, Secondary.

Pastre Ellis Automobile Garage.—Ocean Parkway, Brooklyn, N. Y. (National, Rambler.) Cap. \$35,000. Incorporators: A. E. Pastre, S. H. Ellis, W. L. Holt.

Patch.—A leather or rubber piece for repairing the inner tube of a tire. It may be used for temporarily stopping a puncture or a cut. The dimensions of patches vary, and they are usually secured by means of rubber solution.

Patent Leather Co. of America, The.—Newark, N. J. Mfrs. leather.

Paterson Auto Exchange.—10 Crosby Place, Paterson, N. J. (Cadillac, Haynes, Franklin.)

Paterson Auto Tire Repairing Co.—198 Ellison St., Paterson, N. J. Vulcanizing.

Paterson, Enoch.—Vice-Pres. and Sec. Wm. D. Gibson Co., Huron and Kingsbury Sts., Chicago, Ill.

Paterson, Geo. S.—254 Euclid Ave., Cleveland, O. (Reo, Premier.)

Paterson, Jas.—Red Cloud, Neb. (Mitchell.)

Paterson Vehicle Co.—257 Market St., Paterson, N. J. (Jackson.)

Patina.—See Copper.

Patnot, A. F.—Hanford, Cal. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Patow, Henry W.—Vice-Pres. Detroit Carriage Co., Detroit, Mich.

Patten, W. N.—Honolulu, Hawaiian Islands. (Waltham.)

Patterson, F. H.—Fredonia, Kan. (Waltham.)

Patterson, Geo.—Foreman Machine Dept. Eclipse Machine Co., Elmira, N. Y.

Patterson, George L.—Pres. and Treas. Stanley and Patterson, 23 Murray, 27 Warren St., and 329 Fourth Ave., New York City.

Patterson, Gottfried & Hunter, Ltd.—140-150 Centre St., New York City. Mfrs. jacks, tools, tool bags, brass and copper tubing, wrenches, supplies, hardware, machine work to order.

Patterson-Sargent Paint Co.—Cleveland, O. Mfrs. enamel, paints, varnishes.

Patterson, Wm. T.—Bellefontaine, O. Garage.

Pattinson, D.—Mgr. Machine Shop, Pattinson Mfg. Co., rear 48 Stanhope St., Boston, Mass.

Pattinson Mfg. Co.—48 Stanhope St. Rear, Boston, Mass. Est. 1892. D. Pattinson, Hd. Machine Shop; H. M. Giffin, Car Dept. Repairing.

Patton, Jas. F.—Supt. F. B. Stearns Co., Euclid and Lakeview Ave., Cleveland, O.

Paul & Heming—Jerome Ave. and 162nd St., New York City. Garage.

Paul & Co., J. C.—59 Dearborn St., Chicago, Ill. Mfrs. metal polishes.

Paul, Wm. L.—Pres. Lustre Chemical Co., Sheridan, Ore.

Pauliac fils, F.—usine de Pont-St.-Jean, Bergerac, Dordogne, France. Mfrs. wood wheels.

Paulman & Co., H.—1430 Michigan Ave., Chicago, Ill. (Pierce Arrow.)

Paulus et fils, J.—Marchiennes-au-Pont, Belgium. Mfrs. bodies.

Pawl—A pivot bar so arranged as to drop into the teeth of a ratchet-wheel, as it revolves in one direction, to prevent a back motion when the moving power is withdrawn. The pawl or detent may act by gravity or a spring. See Click.

Pawler, P.—Calumet, Mich. (Wayne.)

Payne, George Hardy.—Pres. Hackett Motor Car Co., 218 Paterson St., Paterson, N. J.

Payne, J. A.—Vice-Pres. The Auto-Motor Car Co., 804-808 Sycamore St., Cincinnati, O.

Payne Co., Inc., John R.—Albany, N. Y. (Stearns.)

Payne, R. S.—Pres. and Treas. The Auto-Motor Car Co., 804-808 Sycamore St., Cincinnati, O.

Payson Varnish Co.—141st St. and Walnut Ave., New York City. Mfrs. varnishes.

Peake, E. E.—Sec., Gen. Mgr. The Hildreth Mfg. Co., Lansing, Mich.

Pearis, H. B.—Pres. Lawrence Motor Car Co., 13-17 W. Warren St., Lawrence, Kan.

Pearl Auto Repair Garage.—161 Main Ave., Passaic, N. J. (Reno, Premier.)

Pearson.—Abbot Rd., Poplar, London, E., England. Mfr. storage batteries.

Pearson, C. W.—625 Landis Ave., Vineland, N. J. Garage.

Pearson, Warren.—Troy, O. (Waltham.)

Pearson, W.—Whitman, Mass. Garage.

Pearson, W. B.—Pres. Detroit Screw Works, Riopelle and Franklin Sts., Detroit, Mich.

Pease, A. H.—Pres. Hart & Hegeman Mfg. Co., Hartford, Conn.

Pease & Sons, S. C.—Merrimac, Mass. Mfrs. wood and metallic bodies, automobile tops. Garage.

Pease, Walter S.—Vice-Pres. and

Purch. Agt. Atlas Motor Car Co., Springfield, Mass.

Peck & Anderson.—Greenburg, Ind. (Cadillac.)

Peck & White.—Anawan St., Fall River, Mass., and Weir St., Taunton, Mass. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Peck, E. E.—Treas. and Mgr. Scovill & Peck, 15 Wooster St., New Haven, Conn.

Peck, F. L.—Designer Babcock Electric Carriage Co., 226-242 W. Utica St., Buffalo, N. Y.

Peck, Geo.—Vice-Pres. Detroit White Lead Works, 532-60 E. Milwaukee Ave., Detroit, Mich.

Peck, J. D.—Peckville, Pa. Garage.

Peck, O. S.—Shelbyville, Ind. (Cadillac.)

Peckham Carriage Co.—19 S. Kenton St., Dayton, O. (Buick, Cadillac, White.)

Peckham Motor Syndicate, F. W.—40 Sackville St., Picadilly, London, England. (Maxwell.)

Pecos Auto Co.—Peco, Tex. (Acme.)

Pedal.—A foot-lever used on motor vehicles for controlling brakes, clutches, speed, power, etc.

Pedal, Accelerator.—A pedal which, acting through a series of flexible wire rods, prevents the governor from closing the throttle-valve, and allows the motor to attain its full velocity. See Accelerator.

Pedal, Brake.—A pedal used for applying brakes, and usually connected with the clutch, so as to withdraw the latter when the brake is applied.

Pedal, Clutch.—A pedal for actuating the clutch.

Pedal, Push.—A pedal designed to be pushed forward instead of being depressed.

Pedal, Regulator.—A pedal for regulating the velocity and power of the motor by acting either on the throttle or on the valves.

Peddinghaus, Carl-Daniel.—Altenvörde, Germany. Mfrs. jacks.

Pedersen Mfg. Co.—400-412 E. 37th St., New York City. Mfrs. gasoline and kerosene burners, brass couplings, lubricators, wrenches.

Pedestal-frame.—See Frame, Pedestal.

Pedigo, R. E.—Lucas, Ia. (Waltham.)

Pedraglio Fratelli.—28 via Milano, Como, Italy. Mfrs. motorcycles.

Peer, E. F.—Sec., Treas. Reo Motor Car Co., Treas. The Hildreth Mfg. Co., Lansing, Mich.

Peerless Belting Co.—78 Main St., Buffalo, N. Y. Belting.

Peerless Equipment Co.—170 S. Clinton St., Chicago, Ill. Mfrs. carbureters, spark plugs, spark timing devices.

Peerless Garage.—942-44 Bedford Ave., Brooklyn, N. Y. (Peerless.) Est. 1906.

Max Melle, Mgr. Garage, 50 cars, repairing.

Peerless Garage Co.—Room 321 Union Bldg., Newark, N. J. (Peerless.)

Peerless Igniter Mfg. Co.—947 Marcy Ave., at Fulton St., Brooklyn, N. Y. Mfrs. storage batteries.

Peerless Motor Car Co.—220 W. 41st St., New York City. (Peerless.) Garage; repairing. C. G. Wridgway, Mgr.

Peerless Motor Car Co. of N. E.—178 Columbus Ave., Boston, Mass. (Peerless.) Est. Aug. 31, 1906. Cap. \$60,000. L. H. Kittredge, Pres.; John L. Snow, Vice-Pres. and Treas.; R. R. Ross, Selling Dept.; P. L. McKinney, Repair Dept. Garage, 25 cars, repairing.

Peerless Motor Car Co., The.—93rd St. and Quincy Ave., Cleveland, O. Makers of the Peerless car; first marketed in 1901. Ten different models made since. Cap. \$600,000. L. H. Kittredge, Pres. and Gen. Mgr.; E. H. Parkhurst, Vice-Pres.; G. B. Siddall, Sec.; Chas. Schmidt, Designer; W. H. Staring, Supt.; F. S. Macourek, Purch. Agt.; W. H. Kirkpatrick, Sales Mgr.; H. L. Foote, Advt. Mgr. Branches, New York City and Boston, Mass. Agents and dealers: Adams & Hart, 47 N. Division St., Grand Rapids, Mich. Albany Garage Co., 28 Howard St., Albany, N. Y. Amos-Pierce Co., 109 S. State St., Syracuse, N. Y. Auburn Auto Co., 60 Water St., Auburn, N. Y. Auto Livery Co., 605 Van Ness Ave., San Francisco, Cal. J. H. Brady Auto Co., 234 Jefferson Ave., Detroit, Mich. Broadway Auto Co., Broadway and Madison St., Seattle, Wash. J. Addison Brown, 205 Illinois Bldg., Champaign, Ill. Buck Auto, Carriage & Implement Co., Davenport, Ia. Centaur Motor Co., 59 Franklin St., Buffalo, N. Y. Cincinnati Auto Co., 215 East 5th St., Cincinnati, O. Covey & Wallace, Portland, Ore. The Curtin-Williams Automobile Co., 122 Parsons Ave., Columbus, O. Fayette Automobile Co., 76 E. Fayette St., Uniontown, Pa. O. J. Garlock & Co., Palmyra, N. Y. Greensburg Automobile Co., Greensburg, Pa. H. O. Harrison Co., 1207-1212 S. Main St., Los Angeles, Cal. Hiland Auto Co., 5811-5817 Centre Ave., Pittsburg, Pa. Indiana Automobile Co., 220 New York St., Indianapolis, Ind. Johnstown Auto Co., 235 Bedford St., Johnstown, Pa. Jonas Auto Co., 728 National Ave., Milwaukee, Wis. G. W. Catlin, 424 5th St., South Minneapolis, Minn. Lilly Carriage Co., Memphis, Tenn. Toledo Motor Car Co., Toledo, O. Paul S. Tobin, care Tobin Motor Car Co., Denver, Colo. Kentucky Auto Co., 1040 3d St., Louisville, Ky. Lamb Automobile Co., 207 6th Ave., Clinton, Ia. Arthur McNall, East Ave. and Court St., Rochester, N. Y. Midland Motor Car Co., 1116 E. 15th St., Kansas City, Mo. Mississippi

Valley Auto Co., 5023 Delmar Blvd., St. Louis, Mo. Motor Car Co., Mt. Royal and Maryland Aves., Baltimore, Md. Motor Car Co., 1314 New York Ave., Washington, D. C. Norris Automobile Co., Saginaw, Mich. The Peerless Motor Car Co. of N. E., 178 Columbus Ave., Boston, Mass. The Peerless Motor Car Co. of N. Y., 220 W. 41st St., New York, N. Y. Quaker City Auto Co., 138 N. Broad St., Philadelphia, Pa. Standard Auto Garage Co., 101 Dollar Bank Bldg., Youngstown, O. Jacob Roth, 1117 State St., Erie, Pa. Sanchez, Jaurez & Co., P. O. Box 1225, Mexico City, Mex. Adelbert Stilson, 1018 Sprague Ave., Spokane, Wash. August Stocker, 71 State St., Salt Lake City, Utah. Tenant Motor, Ltd., 1449 Michigan Ave., Chicago, Ill. Utica Motor Car Co., 333 Bleeker St., Utica, N. Y. The Von Hamm-Young Co., Ltd., P. O. Box 616, Honolulu, T. H. Western Automobile & Supply Co., 115 N. Cascade, Colorado Springs, Colo.

Peerless Rubber Mfg. Co.—16 Warren St., New York City. Mfrs. rubber mats.

Peeters, Cl.—85 rue Heyvaert, Molenbeek-Brussels, Belgium. Mfrs. lubricators.

Peets, C. S.—109 W. 37th St., New York City. Rental service.

Peez & Hoffman.—3rd St., nr. Fowler, Milwaukee, Wis. Mfrs. wood and metallic bodies.

Pegamoid.—A material resembling leather, obtained by a process analogous to that used in making celluloid (q. v.), that is to say, by means of nitrated celluloses, but with the addition of products (siccative oils) capable of giving the "pegamoid" the appearance of leather, as well as its flexibility and impermeability. It is used for making belts, and trimming vehicle bodies.

Pegues, R. T.—Imperial Hotel, Dallas, Texas. (Lambert.)

Peil, A. J.—Sales Mgr. Ovington Mfg. Co., 2208 Broadway, New York City.

Pelgrims, Forges et Ateliers de Construction R.—145 rue Neuve, Brussels, Belgium. Mfrs. wood wheels, springs.

Pelham, Wm.—Repair Dept. Consolidated Bicycle & Motor Co., 185 Notre Dame E., Winnipeg, Can.

Pelinka, Frank.—409 Blue Island Ave., Chicago, Ill. Mfr. cushions.

Peltier, W.—Fort Wayne, Ind. (Pope-Toledo.)

Pelton, Chas. E.—7 Shady Ave., Lowville, N. Y. (Knox.)

Pelton Gasolene Engine Works.—Lyons, Ia. Mfrs. motor boats, circulating pumps, vaporizers.

Pelton Grissel Auto Co.—Fresno, Cal. (Maxwell.)

Penberthy Injector Co.—22 Abbot St., Detroit, Mich. Mfrs. oil cups, drop forg-

ings, water-line gauges, grease cups, lubricators.

Pence Automobile Co.—717 Hennepin Ave., Minneapolis, Minn. (Buick, Packard, Pierce Arrow, Stevens-Duryea, Waltham, Pope-Toledo.)

Pendleton, W. H. E.—7th and Grand Ave., Los Angeles, Cal. (Austin.)

Penfield & Co., A. B.—7 Terrace St., Buffalo, N. Y. Mfrs. asbestos.

Penfield, S. H.—Gen. Mgr. Salisbury Wheel & Mfg. Co., Jamestown, N. Y.

Peninsular Milled Screw Co.—751 Bellevue Ave., Detroit, Mich. Mfrs. bolts, nuts, cups, cones, lock nuts and washers, screw machine products, screws.

Peninsular Motor Co.—Grand Rapids, Mich. Mfrs. gasoline marine motors.

Penn Auto Co.—Pittsburg, Pa. (Crawford, Marmon.)

Penn Automobile Co.—31 Wood St., Reading, Pa. (Thomas Flyer.)

Penn Motor Car Co.—680 N. Broad St., Philadelphia, Pa. (Mitchell.)

Penn Oil and Supply Co.—Chicago, Ill. Mfrs. oils.

Penn Petroleum Co.—117 N. 2nd St., Philadelphia, Pa. Mfrs. oils.

Penn Spring Works.—Baldwinsville, N. Y. Mfrs. automobile springs. Cap. \$28,500. Est. 1870. W. Herbert Robinson, Pres.

Pennsylvania Auto Agency.—7 Motor Mart, Park Square, Boston, Mass. (Pennsylvania, Pullman, Northern.) N. L. Rush, Mgr. Repairing.

Pennsylvania Auto Co.—2234 Broadway, New York City. (Pennsylvania.)

Pennsylvania Auto Metal Body Mfg. Co.—Sinking Springs, Pa. Mfrs. wood and metallic bodies.

Pennsylvania Automobile Co.—Hay St. and Kelly Ave., Wilkesburg, Pa. (Crawford, Marmon.)

Pennsylvania Auto Motor Co.—Bryn Mawr, Pa. Mfrs. gasoline automobiles.

Pennsylvania Ball & Roller Bearing Co.—Girard, Pa. Mfrs. ball and roller bearings.

Pennsylvania Iron Works Co.—50th and Lancaster Ave., Philadelphia, Pa. Mfrs. gasoline automobile motors.

Pennsylvania Motor Federation.—Pittsburg, Pa. Isaac Starr, Jr., 240 Dock St., Philadelphia, Pa., Pres.; Robert P. Hooper, 509 Arch St., Philadelphia, Pa., 1st Vice-Pres.; F. R. Slifer, Milton, Pa., and Vice-Pres.; Paul C. Wolff, Baum & Beatty Sts., Pittsburg, Pa., Sec. and Treas. Membership, A. C. of Blair Co., Automobile Ass'n. of Center Co., A. C. of Delaware Co., A. C. of Germantown, A. C. of Philadelphia, A. C. of Pittsburg, A. C. of Wilkesburg, Bangor A. C., Beaver Valley Motor Club, Corry Motor Club, Erie Motor Club, Lancaster A. C., Motor Club of Harrisburg, Quaker City

Motor Club, Vandergrift A. C., Wilkes-Barre A. C.

Pennsylvania Rubber Co.—Jeannette, Pa. Mfrs. tires, tubes, single tube tires, rubber mats, bumpers, gas-lamp tubing, hose. Member M. & A. M. Cap. \$750,000. Est. May 25, 1899. Herbert Dupuy, Pres.; H. W. Du Puy, Vice-Pres. and Treas.; Geo. W. Shiveley, Sec.; W. Dunbar, Gen. Supt.; C. G. Morrill, Asst. Treas. R. B. McMullen, Gen. Sales Agt. Branches: Atlanta, Ga., 102 N. Pryor St.; Boston, 20 Park Square; Buffalo, 717 Main St.; Cleveland, 2134-6 E. 9th St.; Chicago, 1241 Michigan Ave.; Detroit, 237 Jefferson Ave.; New York City, 1741 Broadway; Philadelphia, 615 N. Broad St.; San Francisco, 512-14 Mission St.

Pennsylvania Steel Co.—Steelton, Pa. Mfrs. angle, channel and tee iron and steel.

Penny, C. B.—Buffalo, N. Y. Garage.

Pentuckert Garage Co.—Central St., Haverhill, Mass. Garage.

Peoria Automobile Club.—R. A. Whitney, Sec., Peoria, Ill.

Peoria Auto Co.—711 Main St., Peoria, Ill. (Pope-Toledo, Pope-Waverley, Cadillac, Franklin.)

Peper Automobile Co.—3022 Olive St., St. Louis, Mo. (American.)

Pequot Garage.—Pequot Ave., New London, Conn. Garage.

Percival, Charles G.—Sales and Advt. Mgr. Cleveland Motor Car Co., 1659 Broadway, New York City.

Percival Jr., E. W.—Fayetteville, N. C. (Waltham.)

Peretti & Co.—Florence, Italy. (Dragon.)

Perez et Cie.—50 rue Paradis, Paris, France. Mfrs. primary batteries, coils.

Perfect Tire Co.—Rock Rapids, Ia. Mfrs. tire treads.

Perfection Automobile Co.—South Bend, Ind. Mfrs. gasoline automobiles.

Perfection Magneto Co.—Anderson, Ind. Mfrs. charging apparatus, magnetos and ignition dynamos.

Perfection Reversing Gear and Supply Co., The.—48 Vesey St., New York City. Mfrs. reversing gears. Cap. \$50,000. Est. Dec., 1905. W. H. Brodie, Pres.; J. R. Brodie, Vice-Pres.; G. D. Maxwell, Sec. and Treas.

Perfection Spring Co.—2414-2420 Superior Ave. N. W., Cleveland, O. Mfrs. leaf springs.

Perfection Storm Shield Co.—Clyde, O. Mfrs. storm aprons and curtains.

Perkins & Corliss.—65 Middle St., cor. Center, Gloucester, Mass., and Manchester, Mass. (Maxwell, Rambler, Stevens-Duryea.) Repairing and supplies.

Perkins Auto Garage.—Main St., Rockaway, N. J. (Corbin.) Est. March, 1905. R. Perkins, Prop. Garage, 30 cars. Repairing, supplies, charging.

Perkins, B. B.—Kingman St., St. Albans, Vt. (Cadillac, Franklin.) Est. 1904. Garage, 6 cars, repairing.

Perkins, F. H.—White River Junction, Vt. (Cadillac, Stanley, Jackson.)

Perkins Launch & Motor Co.—Gloucester, Mass. Mfrs. motor boats.

Perkins, R.—Prop. Perkins Auto Garage, Main St., Rockaway, N. J.

Perlman, L. H.—Pres. Welch Motor Car Co., 1871-73 Broadway, New York City.

Permeability, Magnetic.—The ratio between the number of lines of force (per unit of area) running through a piece of magnetizable material and the magnetizing force that produces them.

Perrine, F. T.—Hd. of Sales Dept. American Veneer Co., Kenilworth, N. J.

Perrin Varnish Co.—1133 Broadway, New York City. Mfrs. varnishes.

Perry, E. B.—Treas. New Amsterdam Motor Co., 152 W. 56th St., New York City.

Perry, F. R.—851 Whitney Ave., New Haven, Conn. (Jackson.)

Perry, F. W.—21 Court St., Taunton, Mass. (Maxwell.)

Perry, Lawrence.—Editor Yachting. B. Newark, N. J., 1875. Ed. Princeton. Address, 20 Vesey St., New York City.

Perry, O. H.—Treas. Columbus Buggy Co., Dublin Ave. W., Columbus, O.

Perry, Sidney R.—Sec. and Treas. Dow Tire Co., 104 W. 42nd St., New York City.

Persiani, Chas. C.—Factory Supt. Clark Bros. Bolt Co., Milldale, Conn.

Peshak & Co., E. H.—Sun Prairie, Wis. Garage.

Pestell, William.—Pres. and Gen. Mgr. Worcester Steel Foundry Co., Millbury, Mass.

Pet-cock.—See Cock, Pet.

Petern Bros.—Millard, Neb. (Rambler.)

Peters & Herron Dash Co., The.—Columbus, O. Mfrs. dashes and fenders.

Peters & Kittell.—Cass and Union Sts., Hornell, N. Y. (Rambler.)

Peters & Mulavey.—Detroit, Mich. Garage.

Peters Bros.—Main St., Algonquin, Ill. Repairing.

Peterson, A. W.—320 W. 3rd St., Davenport, Ia. (Monarch.)

Peterson, Dr. W. A.—Elgin, Neb. (Holsman.)

Peterson, J. P.—Fort Dodge, Ia. (Holsman.)

Peterson Mfg. Co., O. W.—1254 Michigan Ave., Chicago, Ill. Mfrs. acetylene generators.

Peterson, Julius.—Tarrytown, N. Y. Mfr. motorboats.

Peterson, N. E.—1520 Belmont Ave., Seattle, Wash. (Stearns.)

Peterson, O. P.—Box 207, Fort Dodge, Ia. Garage.

Peterson, P. C.—308 Main St., Davenport, Ia. Garage.

Petites Annales Judiciaires du Cycle et de L'Automobile.—Pub. at 35 rue Berge, Paris, France.

Peto & Radford, Ltd.—Ashted, Surrey, and 100 Hatton Garden, London E. C., England. Mfrs. coils, spark plugs, electric lamps, storage batteries.

Petrie, John.—New Haven, Conn. Mfrs. brass pipe fittings.

Petrol.—A name in England for "gasoline."

Petroleum.—An oily hydrocarbon, called also "mineral oil" or "rock oil," found in the earth in many parts of the world, and affording, upon distillation, many important and useful products, such as kerosene, gasolene, benzine, paraffine, lubricating oils, vaseline, etc. See Benzine, Gasolene, Kerosene, Naphtha, Paraffine and Vaseline.

Petroleum Jelly.—Same as Vaseline.

Petry, Wm.—Mechanical Dept. Lisk & Petry, 405-7 Diamond St., Hudson, N. Y.

Pettee, H. F.—Sec. and Treas. Hydraulic Pressed Steel Co., E. 61st St., Cleveland, O.

Petticoat.—In some carburetters, a tube or cone surrounding the spray-nozzle and designed to increase the velocity of the air to be carburetted, and all of which is obliged to pass through it.

Pettis & Bolton.—427 S. Saginaw St., Flint, Mich. (Ford.)

Petzelt & Keyser.—24th and Locust Sts., Philadelphia, Pa. Mfrs. wood and metallic bodies, automobile tops.

Peugeot, A., Tony Huber et Cie.—56 rue du Vieux-Pont-de-Sevres, Billancourt, France. Mfrs. marine motors, motorcycle motors, automobile motors.

Peugeot Frères.—296 Broadway, New York City. United States Branch and selling agents Pergeot Frères, Doubs, France.

Peugeot Frères, les fils de.—Valentigney, Doubs, France. Mfrs. metallic rims, tricarcs, chains, motorcycles (Peugeot).

Peugeot Frères, Société Anonyme des Automobiles.—Audincourt, Seine, France. Mfrs. gasolene automobiles (Peugeot).

Peugeot, Société Anonyme des Automobiles.—83 bvd. Gouvion, St. Cyr, Paris, France. Mfrs. gasolene commercial automobiles (Peugeot).

Peulecke, Fred.—9120-22 Erie Ave., South Chicago, Ill. Garage.

Pfalzische Nachmaschinen & Fahr-raeder Fabrik.—Kaiserslautern, Germany. Mfrs. gasolene automobiles.

Pfanstiehl Electrical Laboratory.—North Chicago, Ill. Mfrs. spark coils.

Pfieber, T. S.—York, Pa. (Jewel.)
Pfizenmayer, C. A.—Duncan Hall, New Haven, Conn. (Winton.)

Pfleger, J.—1602 Bushwick Ave., Brooklyn, N. Y. Garage.

Pflume, Joseph.—Supt. The Cincinnati Electric Tool Co., 650-52 Evans St., Cincinnati, O.

Pfoutz, D. G.—N. 2nd St., Chambersburg, Pa. (Franklin, Cadillac, Pope-Toledo, Pope-Waverley, Pope-Hartford.)

Phaeton.—An open carriage, frequently provided with a top and a single seat (for two) for the owner, and, generally, a servant's seat fixed at the rear and entered from both sides.

Phänomen Fahrradwerke, Gustav Hiller.—Zittau, Germany. Mfrs. motorcycles, tricars (Phänomen).

Phelon & Moore.—Cleckheaton, England. Mfrs. motorcycles (Phelon & Moore).

Phelps, Chas. W.—Sec. Connecticut Steel & Wire Co., 308 Pearl St., Hartford, Conn.

Phelps, G. H.—Co-partner the Harrington Garage, Worcester, Mass.

Phelph, H. J.—Sidney, N. Y. Garage.

Phenix Mfg. Co.—Milwaukee, Wis. Mfrs. portable houses.

Philadelphia Auto Co.—338 N. Broad St., Philadelphia, Pa. (Apperson.)

Philadelphia Auto Exchange.—832 Arch St., Philadelphia, Pa. Supplies.

Philadelphia Auto Repair Shop.—230 N. 22nd St., Philadelphia, Pa. Repairing.

Philadelphia Auto Sales Co.—332 Broad St., Philadelphia, Pa. (Jewel, Reliance, Dolson.)

Philadelphia Grease Mfg. Co.—The Bourse, Philadelphia, Pa. Mfrs. grease, oils.

Philadelphia Motor Car Co.—236 N. Broad St., Philadelphia, Pa. (Frayer-Miller.)

Phil-Penn Motor Co.—206 Drexel Bldg., Philadelphia, Pa. (Frayer-Miller.)

Philadelphia Steel & Wire Co.—525 Commerce St., Philadelphia, Pa. Mfrs. belting.

Philadelphia Storage Battery Co.—Emerald and Tioga Sts., Philadelphia, Pa. Mfrs. primary batteries.

Philadelphia Stove & Iron Foundry Co.—1631 N. 5th St., Philadelphia, Pa. Mfrs. gray iron castings, automobile and motorboat cylinders, pistons, exhaust manifolds, crank cases. Cap. \$55,000. Est. 1863. Robt. W. Trump, Gen. Mgr.

Philip & Son, George.—32 Fleet St., London, England. Pubs. maps.

Phillips & Hamilton.—Bradford, Pa. Mfrs. motorcycles.

Phillips & Wrinch, Ltd.—76 Bay St., Toronto, Canada. (Mitchell.)

Phillips, C. T.—Sec. Direct Drive Axle Co., 575 N. 4th St., Columbus, O.

Phillips, F. A.—Treas. and Sec. W. J.

Duane & Co., 304 W. 54th St., New York City.

Phillips, F. F.—Sales Mgr. General Vehicle Co., Broadway and 62nd St., New York City.

Phillips Motor Works, W. L.—405 Tacoma Bldg., La Salle and Madison Sts., Chicago, Ill. Mfrs. gasoline automobile and marine motors.

Phillips, R. B.—Treas. and Gen. Mgr. American Steam Gauge & Valve Co., 220 Camden St., Boston, Mass.

Phillips, S. M.—Sacramento, Cal. (Autocar, Columbia.)

Phinny, H. B.—Treas. C. A. Duerr & Co., Inc., 2182-6 Broadway, New York City.

Phoenix Appliance Co.—15 W. 28th St., New York City. Mfrs. fire extinguishers.

Phoenix Automobile Exchange.—4495 San Pablo Ave., Oakland, Cal. Garage.

Phoenix Garage.—526-28 Main St., Chico, Cal. Garage.

Phoenix Iron Co.—Phoenixville, Pa. Mfrs. bar iron and steel.

Phoenix Light & Fuel Co.—Phoenix, Ariz. (Cadillac.)

Phoenix Motors, Ltd.—Blundell St., Caledonian Road, London N., England. Mfrs. tricars, motorcycles, gasoline automobiles (Phoenix).

Phosphor-bronze.—A bronze containing from 2 to 5 per cent. of phosphorus. It is very hard and durable, and suitable for parts of machinery exposed to shocks.

Phosphor Bronze Smelting Co.—2200 Washington Ave., Philadelphia, Pa. Mfrs. brass, bronze, aluminum and copper castings, Babbitt and bronze metals.

Picard, Alfred Joseph.—With Wyckoff, Church & Partridge. B. New York City, Jan. 24, 1871. Ed. public schools in New York. De La Salle College. Mem. N. Y. Athletic, A. C. A., Masonic Club. Res., 6 W. 103d St. Address, 1743 Broadway, New York City. In the trade since 1899. Used first car (3 hp. De Dion) 1902. Recreation, automobiling.

Picard, Paul.—Mgr. Chicago Branch Palmer & Singer Mfg. Co. of New York. 1321 Michigan Ave., Chicago, Ill.

Piccoli Fratelli e Ca.—Via Capellari, Milan, Italy. Mfrs. lubricators.

Pickard, C. A.—Pres. Salisbury Wheel & Mfg. Co., Jamestown, N. Y.

Pickard, C. A.—Director Dragon Motor Co., 31st, 32nd and Chestnut Sts., Philadelphia, Pa.

Pickel, J. S.—Sec. Globe Malleable Iron Co., Greenway Ave., Syracuse, N. Y.

Pickering Hardware Co.—Cincinnati, O. (Indian.)

Picker, Moccand et Cie, Société Anonyme des Anciens Établissements.—78 Chene-Bougeries, Geneva, Switzerland. Mfrs. automobile motors, gasoline automobiles (Lucia).

Pickett, Maj. Geo. E.—4th Vice-Pres.

Carter Motor Car Corp., 409-10 Munsey Bldg., Washington, D. C.

Pickling.—The removal of the hard skin in metal castings by immersion in a "pickle" of dilute sulphuric or nitric acid; also a general term for processes in which an acid or other liquid is allowed to act on metals for the purpose of cleaning, etc.

Picklum, Chas. E.—Mgr. and Hd. of Repair Dept. McCook Auto Co., 308 W. Dennison St., McCook, Neb.

Picric Acid.—See Acid, Picric.

Picrome Hide Co.—1417 N. Salina St., Syracuse, N. Y. Mfrs. rawhide gear wheels, leather washers.

Piedboeuf, Ateliers A. G.—63 rue de Fragnér, Liege, Belgium. Mfrs. gasoline automobiles, automobile motors (Piedboeuf Imperia cars.)

Piedmont Motor Car Co.—88 N. Pryor St., Atlanta, Ga. (Pope-Waverley, Marmon.)

Pierce, A. J.—Pres., Treas. and Gen. Mgr. Pierce Engine Co., 2200 Clark St., Racine, Wis.

Pierce, A. L.—Wallingford, Conn. (Waltham.)

Pierce & Hobson.—Trescott, Kan. (Waltham.)

Pierce & Isbell.—1413 Michigan Ave., Chicago, Ill. (Baker.)

Pierce Auto Co.—109 S. State St., Syracuse, N. Y. (Oldsmobile.)

Pierce Engine Co.—1421 Michigan Ave., Chicago, Ill. (Pierce-Racine.)

Pierce Engine Co.—Racine Junction, Wis. Mfrs. gasoline automobile motors, motorboats.

Pierce Engine Co.—2200 Clark St., Racine, Wis. Makers of the Pierce-Racine car; first marketed in 1899. Four models made since. Cap. \$21,000; surplus, \$200,000. A. J. Pierce, Pres., Treas., Gen. Mgr. and Purch. Agt.; J. Schroeder, Sec.; Chris. Carpenter, Vice-Pres.; Wm. Reid, Supt. Agents and dealers: British Columbia Auto Co., Vancouver, B. C.; Butler Motor Car Co., The, 998 Boylston St., Providence, R. I.; Pierce Engine Co., 1421 Michigan Ave., Chicago, Ill.; Pierce-Racine Agency, 1048 S. Main St., Los Angeles, Cal.

Pierce, Frank L.—Sec. and Treas. Gaeth Auto Works, 2553 W. 25th St., Cleveland, O.

Pierce Co., The Geo. N.—Salesroom and General Office, 754 Main St., Buffalo, N. Y. (Pierce-Arrow.)

Pierce Co., The George N.—1651 Elmwood Ave., Buffalo, N. Y. Makers of the Pierce Great Arrow car; first marketed in 1901. Fourteen models made since. Cap. \$315,000. G. K. Birge, Pres.; Henry May, Vice-Pres., Gen. Mgr. and Purch. Agt.; Laurence H. Gardner, Sec.; Charles Clifton, Treas. and Sales Mgr.; Daniel Fergusson, Designer; George

Cook, Supt. Agents and dealers: Auto & Supply Co., Ltd., 24 Temperance St., Toronto, Ont., Can. Banker Bros. Co., Baum & Beatty Sts., Pittsburg, Pa. Binghamton Motor Car Co., 172 State St., Binghamton, N. Y. Blenner, B. A., 1602 W. Broad St., Richmond, Va. Botterill, Thos., 1643 California St., Denver, Colo., and 62 W. 3d, S., Salt Lake City, Utah. Broadway Auto Co., Inc., Madison St. and Broadway, Seattle, Wash. Bush, Wm. E., 953 S. Main St., Los Angeles, Cal. Central Automobile Station Co., 55 West St., Pittsfield, Mass. Clark Auto Co., E. R., 461 Worthington St., Springfield, Mass. Covey & Wallace Motor Co., 16th and Addler Sts., Portland Ore. Ellis Motor Car Co., 222 Halsey St., Newark, N. J. Foss-Hughes Motor Car Co., 201 N. Broad St., Philadelphia, Pa., and 512 Industrial Trust Bldg., Providence, R. I. Frederickson, H. E., 2046-2048 Farnham St., Omaha, Neb. Harolds Motor Car Co., 233 W. 54th St., New York, N. Y. Hibbard Auto Co., 187 Wisconsin St., Milwaukee, Wis. Houston Motor Car Co., Prairie Ave. and San Jacinto Sts., Houston, Tex. Lambert & Von Tacky, 16 N. Franklin Sts., Titusville, Pa. Maguire Co., J. W., 745 Boylston St., Boston, Mass. Metropolitan Motor Car Co., Enclid Ave. and E. 19th St., Cleveland, O. Miner Garage Co., High and Allyn Sts., Hartford, Conn. Mobile Carriage Co., Golden Gate Ave. and Gough St., San Francisco, Cal. Mohler & De Gress, La Independencia 12, Mexico City, Mex. Nickerson Co., F. A., 642 Congress St., Portland, Me. Palace Auto Co., 1408 Walnut St., Kansas City, Mo. Paulman & Co., H., 1430 Michigan Ave., Chicago, Ill. Pence Automobile Co., 717 Hennepin Ave., Minneapolis, Minn. Geo. N. Pierce Co., The, 762 Golden Gate Ave., San Francisco, Cal. Geo. N. Pierce Co., The, 752 Main St., Buffalo, N. Y. Schneider, J. P., 187 Jefferson Ave., Detroit, Mich. Southern Automobile Co., 1200 Mt. Royal Ave., Baltimore, Md. Southern Automobile Co., 105 S. Conception St., Mobile, Ala.; Standard Motor Car Co., Scranton, Pa. Straus, John Mason, 3d and Chestnut Sts., Louisville, Ky. Troy Automobile Exchange, 22 4th St., Troy, N. Y. Utica Motor Car Co., Utica, N. Y. U. S. Auto Co., 21 Plymouth Ave., Rochester, N. Y. Western Auto Co., 4701 Washington Blvd., St. Louis, Mo. Wilson Automobile Co., 117 Craig St., W., Montreal, Can. Wilson & Co., 142 Bank St., Ottawa, Can.

Pierce Hardware Co., The.—Taunton, Mass. (Waltham.)

Pierce, J. O.—Sec. and Treas. Brooks Boat Mfg. Co., Saginaw, Mich.

Pierce, S. K.—Gardner, Mass. Garage.

Pierce, Wallace L.—Pres. Walworth

Mfg. Co., 128-136 Federal St., Boston, Mass.

Pierce, Walter P.—Sec. Davis Automobile Co., 7 Dorrance St., Providence, R. I.

Pierre, Bremond.—107 E. 6th St., Austin, Tex. (Haynes.)

Pierser & Wood.—3838 Vernon Ave., Chicago, Ill. Mfrs. glass wind shields.

Pierson Boat Construction Co.—Duluth, Minn. Mfrs. motor boats.

Pierson, Jesse D.—Washington and Olive Sts., Chester, Pa. Garage.

Pierson Motor Supply Co.—1175 Bedford Ave., Brooklyn, N. Y. Mfrs. and jobbers, lamps, horns and accessories. Est. 1903. Benj. D. Underhill, Gen. Mgr.; H. H. Whitehouse, Sales Mgr.

Pierson, Roy.—Janesville, Wis. (Maxwell.)

Piggins Bros.—Racine, Wis. Mfrs. gasoline marine motors.

Piggott Ltd., John.—117 Cheapside, London, E. C., England. Mfrs. wearing apparel, coats.

Pig Iron.—See Iron, Pig.

Pignolet, Louis M.—78 Cortlandt St., New York City. Mfr. voltmeters, ammeters and volt-ammeters. Est. 1897.

Pigot, Sayre & Co.—135 William St., New York City. Mfrs. grease, oils, oil-cans.

Pilain, Société des Automobiles.—17 Chemin Grange-rouge, Lyons, France. Mfrs. gasoline automobiles (Pilain).

Pilcher, M. S.—Vice-Pres. Nashville Motor Car Co., cor. Church St. and 9th Ave., Nashville, Tenn.

Pile Bloc Co.—253 Broadway, New York City. Mfrs. storage batteries.

Pillar, Steering.—See Steering-pillar.

Pilling, A. J.—Locust St. and Beach Rd., Winthrop, Mass. (Waltham.)

Pillow.—The anti-friction lining (bush) of a casting which forms the bearing of a shaft.



Pillow-block.—A casting, called also a "plummer-block" (see figure), which carries the "brasses forming

the bearing of a shaft.

Pilot Garage & Supply Co.—185 Commercial St., Worcester, Mass. (Pope-Hartford, Pope-Toledo.) Cap. \$10,000. Incorporators: Fred S. Taylor, Pres.; Frederick W. White, Treas.; N. Earle Taylor, Clerk.

Pilot-lamp.—See Lamp, Pilot.

Pilz, Constantin.—Sec. and Treas. The Buehne Steel Wool Co., 93 Nassau St., New York City.

Pin.—A particle of metal which becomes so firmly lodged in the furrows of a file that it has to be picked out with a pointed steel wire. Such particles thus lodged are said "to pin" the

file. (2) A short cylindrical length of metal used for fastening parts of machinery together. (3) The axis of a sheave. (4) Same as "pane." See Pane (2).

Pin, Belaying.—A movable pin to which the slack of running-gear may be made fast.

Pin, Cotter.—See Cotter.

Pin, Crank.—That portion of the crank shaft on which the "big end" of the connecting-rod works.

Pin, Cross-head.—The pin that connects the cross-head to the connecting-rod in a steam-engine.

Pin, Detent.—A pin for limiting the motion of a part in any direction.

Pin-drill.—See Drill, Pin.

Pin, Gudgeon.—The same as wrist-pin, q. v.

Pin, Joint.—See Joint-pin.

Pin, Piston.—A straight, cylindrical piece of hardened steel which is generally made hollow in order to lighten it, which passes through the piston, and on which the upper end of the connecting-rod turns. See Piston.

Pin, Split.—A length of wire bent round until the flat sides are in contact, and a small loop is formed at the bent end. The split end is passed through a hole in a rod or shaft and the ends separated. The loop and separated ends thus serve to retain some object in place.

Pin-switch.—See Switch, Pin.

Pin, Taper.—The same as cotter, q. v.

Pin, Wrist.—The pin which fastens the piston to the connecting-rod in a gas or gasoline motor; sometimes called a "gudgeon-pin."

Pincers.—A tool for extracting nails.

Pinch-nut.—The same as jam-nut. See Nut-jam.

Pinching.—An accident that often occurs to the inner tube of pneumatic tires at the moment of putting in place the second bead. It is a serious trouble which almost always involves the bursting of the inner tube for a considerable length. There are three kinds of "pinching." (1) The first and most frequent, oc-



Fig. 1.



Fig. 2.



Fig. 3.

curs between the beads of the cover and the rim (Fig. 1). (2) The second is due to the introduction of the inner tube under the head of the safety-bolt (Fig. 2). (3) The third, which is much more rare, consists in a fold that the inner tube forms very near the valve and which is held by the valve itself (Fig. 3). In order to prevent pinching, talc must be freely

used and the inner tube be slightly inflated before putting the second bead in place. After the mounting of the latter, it should be made sure that no pinching has occurred, by pushing the cover back by means of a tire-lever and looking into the interior of the rim in order to ascertain whether the inside tube is visible.

Pindar, W. J.—Middleburgh, N. Y. (Mitchell.)

Pine, Dr. Milton B.—127 S. Lafayette St., South Bend, Ind. Garage.

Pingrey, C. H.—Eddy Bldg., Bloomington, Ill. (Reo.)

Pinion.—A small toothed wheel in a pair or train of gears. The pinion has been defined as the diminutive of "toothed wheel." Its teeth are sometimes called "leaves."

Pinion, Bevel.—See Gear, Bevel.

Pinion, Differential.—One of the smaller wheels of a differential train, whether it be of the bevel or straight type.

Pinion, Spur.—See Gear, Spur.

Pinkas, Benj.—Officer, Croftan Storage Battery Co., 423-25 W. Queen St., Toronto, Canada.

Pinkerton, W. A.—Aberdeen, S. Dak. (Cartercar.)

Pinkus, Frederick B.—103 Franklin St., New York City. Mfr. acetylene generators, lamp lighters.

Pinn, W. T.—Michigan City, Ind. (Waltham)

Pintle.—A pin upon which anything pivots. (2) One of the hooks upon which a rudder turns.

Pioneer Auto Co.—Tucson, Ariz. (Buick.)

Pioneer Auto Co.—Long Beach, Cal. (Rambler.)

Pioneer Auto Co.—901-925 Golden Gate Ave., San Francisco, Cal. (Thomas. Oldsmobile, Winton.) 7st. 1900. Cap. \$50,000. E. P. Brinegar, Pres.; Calvin C. Eibs, Vice-Pres.; J. H. Durst, Sec.; W. J. Cornell. Treas.

Pioneer Auto Livery.—1446 Indiana Ave., Chicago, Ill. Garage.

Pioneer Automobile Co.—520-534 20th St., Oakland, Cal. (Winton, Thomas, Oldsmobile.) Est. 1898. E. P. Brinegar, Pres.; Calvin C. Eib, Vice-Pres.; A. C. Wheelock, Mgr. Branch of the Pioneer Auto Co., of San Francisco. Garage, 250 cars. Repairing.

Pioneer Automobile Co.—Benton Harbor, Mich. (Franklin.)

Pioneer Brass Works.—418-424 S. Pennsylvania St., Indianapolis, Ind. Mfrs. brass, phosphor bronze, manganese bronze, aluminum and copper castings, carburetters, timers, spark plugs. Cap. \$10,000. Est. April, 1874. J. H. Brinkmeyer, Pres., and Hd. Machine Shop; Chas. C. Miller, Vice-Pres. and Hd. Foundry. F. A. W. Davis, Sec.

Pioneer Garage.—420 Fourth St., Eureka, Cal. (Ford, Mitchell.)

Pioneer Motorcycle Co.—290 Grove St., Jersey City, N. J. Mfrs. motorcycles.

Pioneer Woolen Mills.—1120 Beaufait St., Detroit, Mich. Mfrs. automobile robes, miscellaneous wearing apparel.

Pipe, Admission.—See Inlet-pipe.

Pipe, Blow-off.—See Blow-off Pipe.

Pipe, Exhaust.—The pipe which conducts the exhaust gases from the cylinder.

Pipe, Feed.—The pipe which carries the liquid from which the power of the motor is generated.

Pipe, Inlet.—The pipe, called also "intake" and "admission pipe," that leads the mixture from the carburetter to the inlet-valve chamber.

Pipe-nipple.—See Nipple.

Pipe, Stand.—A pipe, usually the continuation of the drain-cock, projecting inside the crank-case in order to maintain a certain height of oil therein. (2) The pipe terminating in the spray-nozzle of a carburetter. See Nozzle, Spraying.

Pipe, Steam.—A pipe that leads steam from the boiler to the cylinder of an engine.

Pipe, Water.—A pipe through which water for cooling the cylinder of a motor circulates.

Pipe-wrench.—See Wrench, Pipe.

Piper, L. W.—310 Main St., Stroudsburg, Pa. (Dragon.)

Piquera, J.—108 quai Jemappes, Paris, France. Mfr. metallic rims

Pirelli e Ca.—21 Ponte Seveso, Milan, Italy. Mfrs. pneumatic tires.

Pishon, J. S.—Treas. Eco Mfg. Co., 53 State St., Boston, Mass.

Piston.—In an internal combustion motor, a tubular casting closed at the upper end, and of a slightly smaller diameter than the cylinder in which it slides. The play between it and the cylinder is taken up by a number (generally 3 or 4)



of piston-rings which fit into grooves in the piston and slide with it. These rings have sufficient spring to cause their periphery to engage perfectly with the walls of the cylinder and thus to make an air-tight joint; otherwise the gas would escape around the piston, with a consequent loss of power. The piston is attached to a connecting-rod by a wrist-pin. The figure illustrates a typical piston, alongside of which are shown the piston-rings and wrist-pin. See Piston, Trunk. (2) In a

steam-engine, a disk of slightly smaller diameter than the bore of the cylinder in which it slides, and firmly attached to the piston-rod, the upper end of which is fixed to a crosshead.

Piston, Disk.—A piston which is short in proportion to its diameter so that a cross-head is necessary to keep it from turning crosswise in the piston. See Piston, Trunk, and Piston.

Piston Displacement.—The volume swept out by the piston. It is equal to the area of the cylinder multiplied by the stroke of the piston.

Piston-lead.—See Lead (2).

Piston-pin.—The same as wrist-pin, q. v.

Piston-ring.—One of several expansible rings fitted to the piston in order to make a gas-tight joint between the cylinder wall and piston, so as to hold both the compression and the high pressure of the "explosion."

Piston-rod.—A cylindrical rod which connects the piston to the crosshead in a steam-engine.

Piston-spring.—A piston-ring, or, in some cases, a steel spring placed in the groove round the piston to press the ring outward against the cylinder.

Piston-stroke.—The length of travel of the piston between the two extreme points of its motion. The stroke of the piston is always equal to double the distance between the axis of the crank-pin and the axis of the motor-shaft. It is necessary to know the stroke of the piston and the bore of the cylinder to determine the cylinder-capacity.

Piston, Trunk.—A large hollow, single-acting piston somewhat shorter than its stroke and, in length, usually about one-third more than its diameter, and having the swinging connecting-rod pivoted within. In internal combustion-motors, the piston is universally of this type. See Piston.

Piston-valve.—See Valve, Piston.

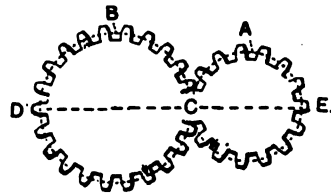
Pit, Inspection.—See Inspection Pit.

Pitch.—The distance between the centers of a number of holes, bolts, rivets, etc. (2) The distance that a screw-thread advances in a single turn, measured along a line parallel to the axis. (3) The distance between the centers of gear-teeth, measured on the "pitch-line." (3) Of a saw, the rake or inclination of the face of a tooth. (4) Of a propeller, the length, measured along the axis of a complete turn. (5) Of a chain, the distance between the centers of two successive pins.

Pitch-chain.—See Chain, Pitch.

Pitch-circle.—The primary object aimed at in the construction of gear-wheels is the uniform transmission of the power, supposing that to be constant and equal. This implies that the one

wheel ought to drive the other as if they simply touched in the plane passing through both their centers. This plane is denoted by the line D C E in the accompanying figure. When such line, called the "line of centers," is divided into two parts proportional to the number of teeth formed upon the circumferences of the pinion and wheel, these two parts are proportional or primitive radii of the pair; and a circle, A B, being de-



scribed from each center passing through the common points, limits what is called a "pitch-line" or "pitch-circle;" that is to say, a circle described from the center and another from the center through the same point, are called, the first, the "pitch-circle" or "pitch-line" of the pinion, and the other of the wheel. If the pitch-circle be divided into as many equal parts as there are teeth to be given to the wheel the length of one of these parts is termed the "pitch of the teeth." One of these arcs comprises a complete tooth and space—space meaning the hollow opening between two contiguous teeth.

By the "pitch-lines" of a pair of gears is therefore to be understood the proportional circles in which they would revolve upon each other were they simply cylinders without teeth; and the pitch of the teeth is the length of arc of the pitch-circles measured from the center of one tooth to the center of the contiguous one. The portion of a tooth within the pitch-circle is called the "root," and the portion outside is called the "point," or "addendum." Any right lines drawn from the center of the wheels till they meet the pitch-circles or lines are termed proportional radii, because they determine the relations of their angular velocities; any similar radial lines continued to the extremities of the teeth are called true radii of the wheel and pinion. In bevel and conical wheels the pitch-circle is the base of the frustrum.

Pitch, Gear-wheel.—To find the pitch of the teeth of gear-wheel, the diameter and number of teeth being given, divide the diameter (in inches) by the number of teeth and multiply the quotient by 3.1416. The product will be the pitch in inches or part of an inch.

Pitch-line.—See Pitch-circle.

Pitch, Mineral.—See Bitumen.

Pitless Turntable Co.—Kansas City, Mo. Mfrs. turntables.

Pitman.—A connecting-rod.

Pitman & Nelson Auto Co.—491 Golden Gate Ave., San Francisco, and 2036 Addison St., Berkeley, Cal. (Page Adrian.) Est. Nov. 5th, 1906. Cap. \$100,000. F. H. Pitman, Pres.; H. P. Nelson, Sec.; W. L. Norris, Mgr. Garage, 40 cars. Repairing.

Pitman, F. H.—Pres. Pitman & Nelson Auto Co., 491 Golden Gate Ave., San Francisco, and 2036 Addison St., Berkeley, Cal.

Pittevil, A.—rue de la Chancellerie, Brussels, Belgium. Mfrs. acetylene lamps.

Pitting.—The erosion of the faces and seats of valves in the form of small hollows or "pock-marks," due to the action of the hot gases in a gasoline-motor. Pitting occurs in places where the metal is of soft texture, and is corrected and removed by grinding the valve on its seat.

Pitts & Wiseley.—Roswell, N. Mex. (Lambert.) Garage.

Pittsburg Auto Co.—2213 Farmers Bank Bldg., Pittsburg, Pa. (Thomas.)

Pittsburgh Automatic Vise & Tool Co.—Wabash Bldg., Pittsburg, Pa. Mfrs. automobile and motorboat vises, wood workers, cabinet makers, plumbers, steam-fitters, machinists and railroad vises. Cap. \$25,000. Est. June 27, 1906. G. P. Blackiston, Pres. and Gen. Mgr.; A. H. Blackiston, Vice-Pres.; T. H. Kehen, Sec. and Treas.

Pittsburgh Automobile Co.—Pittsburgh, Kan. (Pungs-Finch.)

Pittsburg Auto Tire Repair Co.—Baum and Whitfield Sts., Pittsburg, Pa. Vulcanizing and tire repairing.

Pittsburg Brass Mfg. Co.—3153 Penn Ave., Pittsburg, Pa. Mfrs. brass, bronze, aluminum and copper castings, machine work to order.

Pittsburg Gauge & Supply Co.—309 Water St., Pittsburg, Pa. Mfrs. pressure gauges, stampings, safety valves, water alarms and columns.

Pittsburg Machine & Tool Co.—Larcok and Darrah Sts., Allegheny, Pa. Mfrs. steam commercial automobiles.

Pittsburg Machine Co., The.—New Brighton, Pa. Mfrs. hose couplings, automobile motors.

Pittsburg Machine Tool Co.—Allegheny, Pa. Mfrs. steam automobiles.

Pittsburg Motor Vehicle Co.—Pittsburg, Pa. Mfrs. electric commercial automobiles.

Pittsburg Rubber Co.—913 Liberty St., Pittsburg, Pa. (Morgan and Wright tires.)

Pittsburg Seamless Tube Co.—Beaver Falls, Pa. Mfrs. steel tubing.

Pittsburg Valve & Fittings Co.—Pittsburg, Pa. Mfrs. brass pipe fittings.

Pittsburg White Metal Co.—3116-18 Penn Ave., Pittsburg, Pa. Mfrs. babbitt metals.

Pittsfield Auto Garage Co.—228 N St., Pittsfield, Mass. (Rapid, Maxwell.) Supplies, garage and repairing.

Pittsfield Spark Coil Co.—Dalton, Mass. Mfrs. magnetos and ignition dynamos, spark plugs, timers, electric and electric lock switches, wire terminals, spark coils. Michael Casey, Pres.; Chas. A. Byram, Sec.; Wm. P. Wood, Treas. and Mgr.

Pivot.—A pin or short shaft upon which a member turns, rotates or oscillates.

Pivot, Steering.—The jointed end of the front axle of a motor-car. See Axle.

Pixley, O. C.—Des Moines Clay Mfg. Co., Des Moines, Ia. (Jewel.)

Placek, F. A.—Milligan, Neb. (Waltham.)

Plack, Louis, Jr.—Altoona Motor Car Co., 718 Green Ave., Altoona, Pa.

Plagaven et Cie., Ch.—St. Antonin. Tarn et Garonne, France. Mfrs. non-skids.

Plain Bearing.—See Bearing, plain.

Plainfield Motor Car Co.—214 Park Ave., Plainfield, N. J. (Mitchell.)

Planche, E.—Designer Walter Auto Co., 59-61 W. 66th St., New York City.

Planer.—A machine for forming flat surfaces on a metal or object.

Planet-wheel.—The exterior revolving wheel in a planetary-gear.

Planetary Gear.—See Gear, Planetary.

Planimeter.—An instrument which permits of the measurement of the area of any figure by merely drawing a tracing point attached to a system of levers round the perimeter of the figure. It is much employed for finding the areas of indicator-diagrams.

Planishing.—Finishing off bright metal-work by hammering the surface with a smooth hammer.

Plank, A. E.—Quincy, Ill. (Dolson.)

Plank-sheer.—A timber carried around a vessel's hull, covering and fastening the timber-heads; the gunwale.

Plate, Baffle.—See Baffle-plate.

Plate-clutch.—See Clutch, Disk.

Plate, Deck.—See Deck-plate.

Plate-gauge.—See Gauge, Plate.

Plate, Inspection.—See Inspection-plate.

Plate, Iron.—See Iron-plate.

Plate, Screw.—A steel plate provided with threaded holes and employed for cutting threads on a cylindrical piece of metal.

Platform-spring.—See Spring, Platform.

Plating, Nickel.—See Nickel-plating.

Platinoid.—An alloy resembling German silver, q. v.

Platinum.—A metal a little whiter than iron; exceedingly malleable and ductile; and very infusible. It is the heaviest substance known, its specific gravity being 21.5. Platinum is not attacked by air, moisture, or ordinary acids in the slightest degree at any temperature. It is extensively used for chemical vessels, such as stills and crucibles and also for making electric connections through glass. It is also used for making the contact-points of the vibrator of induction-coils, and either alone or alloyed with iridium for the points of spark-plugs.

Platinum, Spongy.—A gray, loosely coherent form of finely divided platinum which readily absorbs certain gases, and is employed in catalytic reactions. It possesses the property of causing the ignition of mixtures of oxygen or air with hydrogen, the gaseous hydrocarbons, carbonic oxide, etc. What is called the "catalytic" ignition of internal combustion motors is based upon such property of spongy platinum. See Catalysis and Ignition.

Platinum Tube.—A tube formerly used for ignition in gasoline motors. It was made of platinum somewhat in the form of a finger, and heated by burners. See Ignition.

Platinum Wire.—See Wire.

Platt, Frederick R.—Editor, The Auto Bulletin, 821 Prudential Bldg., Newark, N. J.

Play.—A limited amount of movement, regular or irregular, allowed on certain parts of a machine, etc. Also room for slight to-and-fro motion. Various devices for "taking up" wear and preventing too much play are used. See Backlash.

Plaza Automobile Co.—918 Union St., Brooklyn, N. Y. (Reo, Premier.)

Plaza Garage.—152 E. 55th St., New York City. Garage.

Pletcher, M. H.—Harrisburg, Pa. (Monarch.)

Plenkarp, I. H.—Chief Engineer Direct Drive Axle Co., 575 N. Fourth St., Columbus, O.

Pliers.—A small pair of pincers for holding, shaping, and cutting wire and small articles.

Plimley Automobile Co.—Victoria, B. C., Canada. (Humber, Rover, Russell, Clement Tolbot.) Est. 1906. Cap. \$100,000. F. Moore, Pres.; T. Plimley, Mgr.; J. H. Gillespie, Sec. and Treas. Garage, 40 cars. Repairing.

Plimley, T.—Mgr. Plimley Automobile Co., Victoria, B. C., Canada.

Ploof, F. H.—Pres. Boston Steam Specialty Co., 170 Congress St., Boston, Mass.

Plow, Henry.—Treas. Hartford Rub-

ber Works Co., 691 Park St., Hartford, Conn.

Plug.—The rotary valve of a cock.
(2) A piece of iron with a male thread for stopping the end of a gas or water pipe. (3) A sparking-plug.

Plug, Connecting.—A piece of metal provided with a handle and employed for joining two parts of an electric circuit.

Plug, Contact.—Same as Cut-off plug.

Plug, Cut-off.—See Cut-off Plug.

Plug, Drain.—A screw plug placed at the bottom of the crank-case of an automobile, and serving to drain it and clean it of all oil or other liquid which it contains.

Plug, Fusible.—See Plug, Safety.

Plug-gauge.—A cylindrical piece of metal accurately turned to a given size and used as a standard in measurement.

Plug Ignition.—See Ignition, Plug.

Plug-key.—A tapered plug for inserting between metal plates and making an electrical connection.

Plug, Magnetic.—See Magnetic Plug.

Plug, Safety.—A plug of fusible metal inserted in the crown-sheet of a boiler, and which melts and allows the steam to escape when the temperature rises above a certain point.

Plug-spanner.—See Spanner, Plug.

Plug, Spark.—See Spark-plug.

Plug, Spark, Magnetic.—See Magnetic Plug.

Plug-switch.—See Switch Plug.

Plumb.—Standing perpendicular, according to a "plumb-line."

Plumbago.—See Graphite.

Plume & Atwood Mfg. Co.—Waterbury, Conn. Mfrs. sheet and rod brass and copper.

Plummer-block.—The same as Pillow-block, q. v.

Plummer, Dr. Jas.—Farmington, Ill. (Jackson.)

Plummer, John Franklin.—N. Y. Mgr. Locomobile Co. of America. B. Brooklyn, New York, Oct. 21, 1872. Ed. Berkeley School, Yale College, 1891. Mem. clubs: University, Ardsley. Res. Irvington-on-Hudson, New York. Office, 2156 Broadway, New York City. In the trade since Jan. 1, 1901. Used first car Jan., 1901.

Plunger.—The piston of a force-pump, or any similar rod that has a plunging motion, such as the "tickler" of a carburetter.

Plunger Pump.—See Pump, Plunger.

Pneu - Héroult.—120 Blvd. Magenta, Paris, France. Mfrs. non-skids.

Pneu Jouvence.—18 rue Traversière, Asnières, France. Mfrs. pneumatic rubber tires.

Pneumatic Comptoir.—50 route de la Révolte, Levallois, Seine, France. Mfrs. pneumatic and solid tires.

Pneumatic-Cuir Samson.—10 rue François-Prémier, Paris, France. Mfrs. leather tires.

Pneumatic Cushion.—See Cushion, Pneumatic.

Pneu L'Electric Co.—1610 Broadway, New York City. Agts. tires for automobiles, wire and carburetters, Esperanto cars. Cap. \$2,000. Est. 2 years. A. J. Myers, Gen. Mgr.

Pneumatic Mfg. Co.—3 South St., New York City. Mfrs. cushions.

Pneumatic Tire.—See Tire.

Pneumatics.—The science dealing with the mechanics of gases.

Pneumatic Tire Protector Co.—14-16 S. St. Clair St., Dayton, O. Mfrs. tire sleeves.

Pneumatic Tire Shield Co.—Cedar Rapids, Ia., Mfrs. tire cases.

Pneumatiques Hutchison.—1 place Louise, Brussels, Belgium. Mfrs. pneumatic tires.

Pocket.—A general term for a recess or cavity in any structure.

Pocket, Air.—See Air-bound.

Pocket Meter Co.—Bluffton, O. Mfrs. ammeters and voltmeters.

Pohle, Oskar.—Dresden, N. Germany. Mfr. bodies.

Pohl und Helbig.—Friedrichstrasse 225, Berlin, Germany. Mfrs. electric lamps.

Poids Lourd, Le.—Pub. at 1 rue Tardieu, Paris, France.

Pointer.—See Index.

Poisat et Cie.—6 rue de la Linierie, Brussels, Belgium. Mfrs. non-skids.

Polack, B.—Waltershausen-im-Thüringen, Germany. Mfr. pneumatic rubber tires, solid tires.

Polarity Indicator.—An electro-chemical instrument used for ascertaining the polarity of an electric current. On connecting the wires of the circuit with the binding-posts of the indicator, and then turning on the switch for an instant, the solution will turn red at one end of the tube. This is the negative pole of the circuit.



Polarization.—A phenomenon produced in the interior of batteries by the passage, to the positive electrode, of disengaged hydrogen, giving rise to an intense counter-current. This phenomenon is prevented from occurring by putting near the positive electrode a depolarizing material which disengages oxygen to form water with the liberated hydrogen.

Poldi, Acieries.—56 ave Parmentier, Paris, France. Mfrs. springs.

Pole Armature.—See Armature.

Pole-finder.—See Pole-paper and Polarity Indicator.

Pole-paper.—For ascertaining the polarity of the terminals of a storage-battery or a light circuit, a piece of litmus-paper may be used. If the paper be moistened and the ends of the wire be placed on the opposite ends of it, a red spot will appear around the end of the negative wire.

Poles, Battery.—Metallic pieces terminating the electrodes of a battery, and to which are fixed the conducting wires. One of these poles is called the "positive," and is always indicated by the sign + or is painted red; and the other is called the "negative," and is indicated by the sign —.

Poles, Magnetic.—In general language, the ends of a magnet or magnetized bar; the parts of the magnet at which the magnetic properties appear to be chiefly concentrated.

Pohhl, John H.—Fitzgerald, Ga. (Pope-Hartford.)

Polkey.—Finsbury Pavement House, London E., England. Mfrs. oil lamps.

Pollard Auto Station.—230 Main St., Nashua, N. H. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, Cadillac.) Est. since 1893. Garage. Repairing.

Polson, W. F.—22 W. Utica St., Buffalo, N. Y. Mfrs. foot rests, robe rails, tire holders, tire tools, valve lifters, glass wind shields.

Poly-Phase Ignition System Co.—52 Broadway, New York City. Mfrs. magnetos and ignition dynamos.

Pomeroy, H. B.—Supt. Dolson Automobile Co., Charlotte, Mich.

Pomeroy, S. G.—West Lebanon, Ind. (Waltham.)

Pomona Garage Co.—Pomona, Cal. (Reo.)

Pon & Whatley.—Columbus, Ga. (Cadillac, Buick.)

Pond Machine & Foundry Co., L. W.—186 Main St., Worcester, Mass. (Premier, Reo, Maxwell, Ford, Pope-Waverley, Mercedes.)

Pontiac Body Co.—Pontiac, Mich. Mfrs. wood and metal bodies.

Pontiac Knitting Co., Pontiac, Mich.—Mfrs. wearing apparel, caps, gloves and gauntlets.

Pontiac Motor Car Co.—Pontiac, Mich. Mfrs. gasoline commercial automobiles.

Pontiac Spring & Wagon Works.—Pontiac, Mich. Mfrs. automobiles, gasoline. (Pontiac, 12 h.p.)

Poole, C. W.—1423 10th Ave., Seattle, Wash. (Cleveland.)

Poole, W. J.—370 12th St., Oakland, Cal. Garage.

Pope, Albert Augustus.—Manufacturer bicycles and automobiles. B. Boston, May 20, 1843. Ed. public schools, Brookline, Mass. Because of family reverses,

left school; was clerk in shoe findings store in Boston at \$4 a week. Captain



in Home Guards, 1861-1862; August, 1862, enlisted 35th Mass. Infantry; served until end of war, becoming lieutenant colonel; brevetted for gallant conduct in battles of Fredericksburg, Knoxville, Poplar Springs Church, and Petersburg. In wholesale shoe findings business,

1865-1876; established 1876, the Pope Mfg Co. to manufacture and sell small patented articles; same year began selling imported bicycles; in 1878 introduced the bicycle manufacturing industry in the United States. Since then a leading manufacturer. Founded "The Wheelman" (now absorbed in "Outing") in the interests of cycling; leader in good roads movement; has large interests in banks and other corporations; member Loyal Legion, Society of the Cincinnati, and other societies, etc.; has served as visitor Wellesley College, and Lawrence Scientific School, Harvard. Res. Cohasset, Mass. Address, Hartford, Conn.

Pope, Albert Linder.—Receiver Pope



Mfg Co. and Pope Motor Car Co. B. Newton, Mass., July 14, 1872. Ed. Phillips Exeter Academy, Exeter, N. H. Director Pope Mfg. Co., Pope Motor Car Co., Federal Mfg Co., Columbia Steel Co. Pres. and mem. Executive Committee National Ass'n

Auto Mfrs. Mem. Hartford, Engineers' Club of Hartford and New York. Res., 135 Oxford St., Hartford, Conn. Office, Pope Mfg. Co., Capitol Ave., Hartford, Conn. In trade since 1895.

Pope Auto Co.—Cedar and Halsey St., Newark, N. J. (Pope-Hartford.)

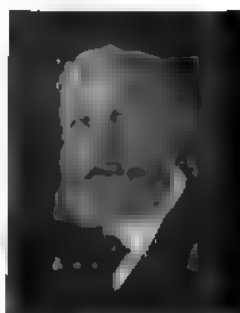
Pope Automobile Co.—Washington, Pa. Garage.

Pope Automobile Co. of Washington.—817-19 14th St., Washington, D. C. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Locomobile, Autocar). Est. Nov., 1906, taking over the Pope Mfg. Co.'s business. Cap. \$25,000. Chas. M. Campbell, Pres.; C. E. Wood, Vice-Pres.; R. G. Donaldson, Sec.; Geo. W. White, Treas.; C. Royce Hough, Gen. Mgr.; E.

P. Hough, Salesman; Edward Ash, Foreman. Garage. 30 cars. Repairing.

Pope Boat Co., The.—Fond-Du-Lac, Wis. Mfrs. motorboats.

Pope, George.—Treas. Pope Mfg. Co., Pope Motor Car Co. and Columbia Steel



Co. B. Boston, Mass., Jan. 9, 1844. Ed. public school of Brookline, Mass., 3 yrs. high-school. Director Pope Mfg Co., Pope Motor Car Co., Columbia Steel Co., Federal Mfg. Co. Mem. Hartford, Engineers' Club of N. Y., Army & Navy Club of N.

Y. Res., Hartford, Conn. Office, Pope Mfg. Co., Capitol Ave., Hartford, Conn. In the trade since 1897. Used first car (electric) 1897. (gasoline) 1904. Recreations: Bicycling, photography, shooting and fishing.

Pope, Harold L.—Asst. Mgr. Pope Motor Car Co., Toledo, O. B. Newton, Mass., Nov. 5, 1879. Ed. Knapp's School, Plymouth, Mass., Concord Home School, Concord, Mass.; Hale & Noble's School, Boston, Mass.; Peekskill Military Academy, Peekskill, N. Y.; Mass. Institute of Technology, Boston, Mass. Mem. Engineers' Club of N. Y., American Society of M. E. Office, Pope Motor Car Co., Toledo, O. In the trade since June, 1899. Used first car 1899.

Pope Manufacturing Co.—Hartford, Conn. Makers of the Pope-Hartford car; first marketed in 1902. Six models made since. Cap. \$22,500,000. Albert A. Pope, Pres.; Albert L. Pope, Vice-Pres.; Chas. E. Walker, 2nd Vice-Pres.; George Pope, Treas.; Wilbur C. Walker, Sec.

Pope Manufacturing Co.—Hartford, Conn. Mfrs. and jobbers tire cement, horns, hydrometers, jacks, eye shields, automobile body soaps, hand soap, all automobile and bicycle sundries Est. Feb. 27, 1903.

Pope Manufacturing Co.—707 Rector Bldg., Chicago, Ill. Mfrs. motorcycles.

Pope Motor Car Co.—139 S. East St., Indianapolis, Ind. Makers of the Pope-Waverley electric car; first car marketed in 1898. Sixty-seven models made since. Albert A. Pope, Pres.; Albert L. Pope, Vice-Pres.; George Pope, Sec. and Treas.; Herbert H. Rice, Mgr.; Wilbur C. Johnson, Asst. Mgr.; Harold H. Kennedy, Designer; Emil C. Hardegen, Supt.; William H. Brown, Purch. Agt.; Oscar B. Henderson, Sales Mgr.; J. Burgess Brown, Jr., Advt. Mgr.

Pope Motor Car Co.—Casino Terrace,

Newport, R. I. Supplies, garage, and repairing.

Pope Motor Car Co.—Toledo, O. Makers of the Pope-Toledo car; first marketed in 1901. Twenty-four different models made since. Cap. \$2,500,000. Albert A. Pope, Pres.; Albert L. Pope, Vice-Pres. and Asst. Gen. Mgr.; George Pope, Treas.; H. L. Pope, Gen. Mgr.; J. E. Talty, Purch. Agt.; F. C. Gilbert, Sales Mgr.; W. B. Hankins, Advt. Mgr.; D. B. Beckwith, Supt.; H. L. Sheppler, 2d Asst. Supt.

Pope-Toledo Motor Car Co.—425 Delaware St., Kansas City, Mo. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

Poppenberg Automobile Co.—674-676 Main St., Buffalo, N. Y. (Rambler, Reo, Premier, Reliance.)

Popping.—"Snapping" or "popping" in the carburetter is invariably caused by a lack of gasoline, so that the mixture fed to the motor is not rich enough and burns so slowly that one of the admission-valves may be opened before the charge is completely burned, and part of it is forced back through the pipe leading from the carburetter to the combustion-chamber.

Popping in the carburetter may also be caused by a leaky joint in the piping and connections between the carburetter and the combustion-chamber.

Porcelain.—A white and opaque pottery made by heating, at a high temperature, a mixture of pure clay (kaolin), white sand, and feldspar, the latter acting as a flux and rendering the mass translucent. The material, in the form of tubes, is used for the insulation of the center rod of spark-plugs.

Porrier, A.—Franklin St., Garden City, Long Island, N. Y. (Maxwell.) Garage; repairing.

Port.—An opening by which steam or gas enters or leaves the cylinder of a steam or gasoline motor. (2) The left or "larboard" side of a boat looking from stern to bow.

Port, Air.—A scuttle in the bow of a boat for the admission of air when the ports are down.

Port Huron Engine & Thresher Co.—Port Huron, Mich. Mfrs. malleable iron castings.

Portable Construction Co.—16 S. William St., New York City. Mfrs. portable garages and houses.

Portage Boat & Engine Co.—Portage, Wis. Mfrs. motorboats.

Porter, Joseph D.—Sales Mgr. Wayne Automobile Co., Detroit, Mich.

Porter, F. R.—East Stroudsburg, Pa. (Rambler.)

Porter, Walter R.—Keene, N. H. (Elmore.)

Porthos, Société Generale des Automobiles.—12 rue du Dôme, Billancourt, Seine, France. Mfrs. gasoline automobiles. (Porthos cars.)

Portland Co., The.—Portland, Me. (Knox.)

Portland Garage Co.—51 Cross St., Portland, Me. Mfrs. body irons, brakes. Repairing.

Portsmouth Garage, The.—Fleet St., Portsmouth, N. H. (Stevens-Duryea.)

Posener Verein für Luftschiffahrt.—(Aero Club of Posen.)—Posen, Germany.

Positive.—A term used for motion which is definitely produced by some mechanism as distinguished from motion which occurs through lack of some restraining device. (2) Of polarity, the opposite of negative.

Positive Lock Washer Co.—Newark, N. J. Mfrs. lock nuts and washers, washers.

Post & Lester Co.—Sargeant St., Hartford, Conn. Est. 1893. Supply house and jobbers, handling all kinds automobile supplies, specialties, horns, lamps, goggles, clocks, etc. D. J. Post, Pres.; C. H. Veeder, Vice-Pres.; H. W. Lester, Treas.; C. B. Lamb, Sec. Branch, 821 Boylston St., Boston, Mass.

Post, Amos.—Catskill, N. Y. (Franklin.)

Post, Aubries.—Pres. Welch Motor Car Co., Pontiac, Mich.

Post, David Judson.—Pres. Post & Lester Co., Treas. Veeder Mfg. Co. B. Vienna, Warren Co., N. J. Jan. 28, 1861. Ed. public school Vienna, Blair Academy, Blairstown, N. J. Director Post & Lester Co., Veeder Mfg. Co. Mem. clubs: Hartford, Country, Hartford A. C., Hartford Yacht. Res., 23 Washington St.; address, Cor. Garden and Sargeant Sts., Hartford, Conn. Used first car 1901, motor-boat 1900.

Post, E. L.—Cold Spring, N. Y. (Walham.)

Postal Auto & Engine Co.—Bedford, Ind. Mfrs. gasoline automobiles.

Postma, J. Titus.—177 Bvd. Peréire, Paris, France. Mfr. electric horns.

Potash Bichromate.—A red crystalline solid used in solution as a depolarizer in the "bichromate cell."

Potassium Cyanide.—A white crystalline solid, very poisonous, sometimes used for the tempering of metals.

Potassium Ferrocyanide.—A salt of potassium having the chemical formula $K_4Fe(CN)_6$, and commonly called "yellow prussiate of potash." It is sometimes used in the case-hardening of iron. The iron of which the surface is to be hardened is heated to a dull red and the salt either sprinkled upon it or rubbed on it

in the lump, or the iron rolled in the powdered salt, and then returned to the fire for a few minutes, and finally immersed in water. By this means a sufficient coating of steel may be given to parts not exposed to wear.

Potchernick.—E. Houston St., San Antonio, Tex. (Maxwell.)

Potential, Difference of.—See Force, Electromotive.

Potential, Electrical.—The work which must be done (against electrical forces) on a unit positive charge, in order to bring it up to a given point from an infinite distance, is termed the electrical potential at that point. The potential V , due to a charge Q , at a distance r

from the charge is $V = -\frac{Q}{r}$

Potential Energy.—See Energy, Kinetic.

Potential, Magnetic.—The work which must be done (against magnetic forces) in order to bring a unit positive pole up to a given point from an infinite distance is termed the magnetic potential at that point.

Pottron, Em.—29 rue Riquet, Paris, France. Mfr. springs.

Potstone.—The same as talc., q. v.

Pottelet et Preudhomme.—33 rue Jules Van Praet, Brussels, Belgium. Mfrs. motorcycles.

Potter & Johnston Machine Co.—Pawtucket, R. I. Mfrs. special automobile machinery, vises.

Potter, H. R.—Treas. Crescent Auto & Machine Co., Cor. E. 2nd and Marr Sts., Fond du Lac, Wis.

Potter Mfg. Co.—New Brunswick, N. J. Mfrs. gasoline marine motors.

Potter, S. E.—Bet. Elm and Walnut Sts., Pierce City, Mo. (Ford.) Est. 1904. Garage, 12 cars. Repairing.

Potter & Sons, W. N.—Newfield, Mass. (Atlas.)

Potts, H. L.—Sec. Chadwick Engineering Works, 3207 Spring Garden St., Philadelphia, Pa.

Pot-valve.—The same as pop-valve. See Valve-pop.

Pound, Avoirdupois.—The English unit of weight. It is equal to 453.59 grammes, and contains 7,000 grains.

Pound-degree.—The unit of heat commonly used by English engineers. It is the amount of heat necessary to raise one pound of water 1° F.

Pound, Foot.—The English unit of work; the amount of work required to be expended in order to raise one pound through a vertical height of one foot.

Pound, Inch.—A unit of work; the work done when one pound is raised one inch.

Poundal.—The unit of force in the English system. It is the force which, if it act on a mass of one pound, will produce therein an acceleration of one foot per second per second.

Powell & Young.—52 W. 43rd St., New York City. Mfrs. clutches.

Powell Automobile Co.—Omaha, Neb. (Baker, Cadillac, Franklin, White.)

Powell Co., The William.—2525-31 Spring Grove Ave., Cincinnati, O. Mfrs. brass pipe fittings, grease cups, lubricators, throttle valves.

Powell, Fred M.—Vice-Pres. and Mgr. MacFarland Powell Co., Denver, Colo.

Powell Muffler & Timer Co.—42 La Fayette St., Utica, N. Y. Mfrs. mufflers, muffler cutout valves, timers.

Powell's Cove Boat & Engine Co.—College Point, L. I. Mfrs. motorboats.

Powell's Garage.—1404 Ridge Ave., Philadelphia, Pa. (Frayer-Miller.)

Powelson, W. V. N.—Gen. Mgr. Union Light & Power Co., 3920 Morgan St., St. Louis, Mo.

Power.—505 Pearl St., New York City. Pub. monthly by the Hill Pub. Co.

Power.—The amount of work done in a unit of time. The less the time required to do a given amount of work the greater the power. In popular language, "power," "force" and "work" are not clearly distinguished, and force is often confused with power or work. See Force and Work.

Power-boat.—See Boat. Power.

Power Boating.—Browning Bldg., Cleveland, O. Pub. monthly, by the Penton Pub. Co.

Power, Candle.—See Candle-power.

Power, Horse.—A unit of work based upon the strength of a horse, which is supposed to draw a load at the rate of three miles an hour (that is to say, at the rate of 264 feet a minute), and to exert a force or pressure against the collar, in a forward direction, of 125 pounds. $264 \times 125 = 33,000$, so that a "horse-power" is work done at the rate of 33,000 foot-pounds per minute, or 550 foot-pounds per second, or 746 watts (volts \times amps.)

Power, Horse, Actual.—The amount of horse-power actually applied at a given point, as to the driving-wheel of a motor-car.

Power, Horse, Brake.—The power developed by an engine or motor, and which is absorbed by a brake dynamometer; distinguished from the indicated horse-power (q. v.) as being the amount of power which an engine can put out for useful work. See Dynamometer.

Power, Horse, Calculated.—The horse-power of a motor as figured from its dimensions and specified conditions of operation.

Power, Horse, Delivered.—The actual amount of power that an engine delivers for work.

Power, Horse, Effective.—See Power, Horse, of Motors.

Power, Horse, Electric.—The rate at which electric energy is supplied or developed. It is proportional to the strength of the current and also to the e. m. f. The unit in which electrical power is measured is the work done in one second by a current of one ampere supplied at a potential difference of 1 volt, and is termed a "watt." One watt=10⁷ ergs per second, and 746 watts=1 horse-power.

Power, Horse, French (Cheval-vapeur).—The "Cheval-vapeur" is the unit of power still employed in France in concurrence with the "poncelet" (981W). It corresponds to a work of 75 kilogram meters effected during one second, and is equivalent to 0.9863 English h.p.; or 1 English h.p.=1.0139 French h.p. One French h.p. also equals 736 watts.

Power, Horse, German (Pferde-Stärke).—One German horse-power (P. S.) equals 735 watts or 0.986 English horse-power, and 1 English h.p.=1.12 German P.S. (approximately).

Power, Horse, Hour.—One horse-power developed for an hour.

Power, Horse, Indicated.—The actual work performed by the steam or gas in the cylinder, as calculated from the indicator-diagram. The difference between the i.h.p. and the b.h.p. gives the engine efficiency.

Power, Horse, Motor.—The power of a motor is the work which it effects per second, and is expressed by foot-pounds per second, or, practically, by "horse-power" (550 foot-pounds per second). The "indicated" power of a motor is that resulting from the work of the gas or steam in the cylinder. The "effective" power is that which is received upon the shaft. The first is measured by means of diagrams taken with an indicator for slow motors or with a manograph for fast ones, and the second by means of a dynamometer, or dynamometric brake (such as the Prony brake, Renard moulinet, etc.). The ratio of the effective power to the indicated power gives the mechanical or organic efficiency of the motor.

To estimate the power of an automobile motor accurately is unfortunately a very delicate matter. Witz, in his standard treatise on gas and gasoline motors, gives the following general formula based upon the mean pressure of the "explosive" mixture:

$$P = Kp \frac{\pi D^2 L \omega}{4 \times 60 \times 75}$$

where P is the maximum power, ex-

pressed in horse-power for each cylinder; K, the organic efficiency of the motor (which it is not prudent to estimate above 0.75; p, the mean pressure; D L, the cylinder-bore and piston-stroke in millimetres; and ω , the angular velocity of the motor in revolutions per minute.

But the determination of the mean pressure, p, is very difficult, and yet indispensable for the application of the above formula to a given motor, since the amount of such pressure varies greatly according to the motor, and sometimes even in the same motor. The figures noted at the laboratory of the Technical Committee of the Automobile Club of France and those collected by M. Lumet leave no doubt in regard to this. The difficulties of such determination render the current use of the formula impossible.

As a substitute for it, different authors have proposed simpler formulas, which M. L. Perisse has recalled in the Official Bulletin of the Technical Committee of the A. C. F. This committee, in order to fix the regulation of the tests of endurance, having needed a convenient formula for giving the power of a motor according to its dimensions, finally decided upon the following:

$$P = 0.0028 D^4,$$

where P represents the maximum power that the motor is capable of developing, expressed in h.p., and D the bore in millimetres in a four-cylinder motor. Such power must, therefore be divided by 4.2 or 4.3 if the motor has but 1, 2 or 3 cylinders. It is, moreover, applicable only to motors of less than 50 h.p.

M. R. Arnoux, Vice-President of the Technical Committee, who, as long ago as 1903, criticized the square of the bore formula, at that time proposed by M. E. Mors for the classification of automobiles, recommends that of the cube of the bore. It is his opinion that, if the power of motors (mean pressure and piston displacement being equal) is proportioned to the volume generated by the piston, to use a square of the bore formula is to commit the same error as to measure the volume of a capacity in square metres, and that the formula, in order to be rational, should be of the form:

$$P = KD^3$$

By calculating the co-efficient, K, according to the data and experimental measurements furnished by 33 four-cylinder motors, of which the effective horse-powers are comprised between 14 and 135, and by taking the square root of the mean of the squares of these 33 values of K, M. Arnoux has reached the formula:

$$P = 0.0000025 D^3,$$

which he considers applicable to all the

motors now constructed, including those of the most powerful racing-cars.

British Formula.—The formula for calculating the horse-power given by one cylinder, and in which the power shown must, for a multi-cylinder motor be multiplied by the number of cylinders, is

$$H. P. = \frac{PLAN}{33,000}$$

in which P is the mean effective pressure of 90 pounds per square inch, L the stroke of the motor in feet, A the area of the piston, and N the revolutions per minute.

German Formula.—A memorial, subscribed by a large number of motor-car builders and addressed to the Imperial Treasury Department of the German Government, acknowledges their unanimity on the point of accepting the following formula for determining the horse-power of motor-cars, viz:

$$N = 0.3 ID^2S,$$

in which N signifies the horse-power to be ascertained, D the bore of the cylinder, I the number of cylinders, and S the stroke. The formula is based on an allowance of 3.8 kgs. to the sq. cm. (54 lbs. per sq. in.) as the mean pressure of the piston and 900 revolutions per minute, and has been pronounced satisfactory by the Technical Department of the Imperial Treasury. The Automobile Association of Central Europe has agreed also to accept this formula, which, according to the Imperial Treasury, will be recognized by the administrators of taxes in the Federal States until the respective supplementary clause has been added to the provisions of the Imperial Stamp Law. The proposed formula is applicable, however, only to gauging the horse-power of motor-cars fed with gasoline or alcohol, in which connection it is left with the builder of or dealer in such cars to supply the buyer with an authenticated certificate from the factory, showing the horse-power of each car, arrived at by means of the formula in question.

American Formula.—The horse-power formula adopted by the Mechanical Branch of the Association of Licensed Automobile Manufacturers, May 9, 1907, is:

$$H. P. = \frac{D^2 \times N}{2.5}$$

in which D is the bore of the cylinder in inches, and N the number of cylinders.

The following table gives the horse-power developed by 2, 4 and 6-cylinder motors of different bores, calculated according to the last-named formula:

BORE		HORSE POWER			
Ins.	Mill.	1 Cyl.	2 Cyl.	4 Cyl.	6 Cyl.
2 1-2	64	2 1-2	5	10	15
2 5-8	68	2 3-4	5 1-2	11	16 1-2
2 3-4	70	3	6	12 1-10	18 1-5
2 7-8	73	3 5-16	6 5-8	13 1-4	19 7-8
3	76	3 3-5	7 1-5	14 2-5	21 3-5
3 1-8	79	3 15-16	7 13-16	15 5-8	23 7-16
3 1-4	83	4 1-4	8 1-2	16 9-10	25 2-5
3 3-8	85	4 9-16	9 1-8	18 1-4	27 2-5
3 1-2	89	4 9-10	9 4-5	19 3-5	29 2-5
3 5-8	92	5 1-4	10 1-2	20 1-4	31 3-5
3 3-4	95	5 5-8	11 1-4	22 1-2	33 3-4
3 7-8	99	6	12	24	36 1-16
4	102	6 2-5	12 4-5	25 3-5	38 2-5
4 1-8	105	6 13-16	13 5-8	27 1-4	40 9-10
4 1-4	108	7 1-4	14 1-2	28 9-10	43 4-5
4 3-8	111	7 5-8	15 5-16	30 5-8	45 15-16
4 1-2	114	8 1-10	16 1-5	32 2-5	48 3-5
4 5-8	118	8 9-16	17 1-8	34 1-4	51 3-5
4 3-4	121	9	18	36 1-10	54 1-10
4 7-8	124	9 1-2	19	38	57
5	127	10	20	40	60
5 1-8	130	10 1-2	21	42	63
5 1-4	133	11	22	44 1-10	66 1-5
5 3-8	137	11 9-16	23	46	69 1-10
5 1-2	140	12 1-10	24 1-5	48 2-5	72 3-5
5 5-8	143	12 5-8	25 5-16	50 5-8	75 15-16
5 3-4	146	13 1-4	26 1-2	53	79 1-2
5 7-8	149	13 13-16	27 5-8	55 1-4	82 9-10
6	152	14 2-5	28 4-5	57 3-5	86 2-5

Power, Horse, Motor-boat.—See Boat, Racing.

Power, Horse, Nominal.—Horse-power calculated approximately, without taking into account all factors, such as fractional losses, etc. A term used by Boulton and Watt, but not applicable to modern engines.

Power, Live.—See Force. Live.

Power-plant.—In a motor-vehicle the motor and transmission.

Power-transmission.—The mechanism used in motor-cars for transmitting power are: (1) The differential gear, which transmits the power from the speed-change gear to the rear axle or wheels; (2), the friction-clutch, which forms the connecting and disconnecting medium between the motor and speed-change gear; and (3), the speed-change gear, which transmits the power of the motor to the differential at varying speeds, wholly independent of the motor-speed.

Power Co., J. J.—653 E. Main St., Madison, Wis. Mfrs. carburetters.

Powers, A. H.—San Francisco, Cal. (Waltham.)

Powers, Harry J.—Vice-Pres. Chicago A. C. and Chairman Good Roads Com. Prop. Powers' Theatre. Director Illinois Theatre, Auditorium Theatre, Colonial Theatre. Mem. clubs: Chicago Athletic, Chicago A. C., South Shore Country. Res., 4843 Grand Blvd., Chicago, Ill. Office, Powers' Theatre, Chicago, Ill.

Power Vehicle Service Co.—North and Madison Aves., Baltimore, Md. (Welch.)

Power Wagon, The.—American Bldg., Cleveland, O. Pub. monthly.

Powhattan Brass & Iron Works.—Charleston, W. Va. Mfrs. brass pipe fittings.

Powow Foundry.—Amesbury, Mass.

Mfrs. brass, bronze, aluminum and copper castings.

Poyer, D. F.—518 Main St., Menominee, Mich. (Buick, Cadillac.)

Practical Engineer.—Pub. in London, England.



Prade, Georges, Edouard.—80 Boulevard Flandrin, Paris, France. Born at Paris, Oct. 14, 1875. Editor-in-Chief of Les Sports. Licentiate of Letters.

Prasch, P. S.—Buck St., Paulsboro, N. J. (Waltham.)

Pratique Automobile Vulgarisée, La.—Pub. at 101 Ave. Henri-Martin, Paris, France.

Pratt & Lambert.—79 Tonawanda St., Buffalo, N. Y. Mfrs. varnish.

Pratt & Whitney Co., The.—Hartford, Conn. Mfrs. special automobile machinery.

Pratt, A. J.—Coldwater, Mich. (Buick.)

Pratt, C. B.—105 Grand St., East Weymouth, Mass. Garage.

Pratt, F. Alcott.—Treas. Concord Motor Car Co., 64 Huntington Ave., Boston, Mass.

Pratt, Geo. B.—Elkhart, Ind. (Locomotive.)

Pratt, James B.—Sec. and Treas. John S. Leng's Son & Co., 33 Murray St., New York City.

Pre-admission.—The admission of fresh steam to a cylinder shortly before the end of the stroke.

Precision Appliance Co.—832 Austin Ave., Chicago, Ill. Mfrs. carbureters, lubricators, oil cups, oil pumps, circulating pumps, timers, universal joints.

Premier Cycle Co.—Nüruberg, Germany. Mfrs. motorcycles.

Premier Motor Mfg. Co.—Georgia and Shelby Sts., Indianapolis, Ind. Makers of the Premier car; first marketed in 1903. Cap. \$150,000. Harold O. Smith, Pres.; Jno. R. Love, Sec.; G. A. Wiedely, Treas. and Supt.; H. B. Hewitt, Purch. Agt.; R. I. Eads, Sales Mgr.

Prentiss Motor Car & Supply Co.—15 Berkeley St., Boston, Mass. (Studebaker.)

Prentiss Tool & Supply Co.—115 Liberty St., New York City. Mfrs. special automobile machinery.

Prescott, B. M., Jr.—Main St., Franklin Falls, N. H. Garage.

Prescott, J. A.—Pres. and Mgr. Lak-

del Automobile Co., 5143 Delmar Bldg., St. Louis, Mo.

Press, John E.—131-133 N. Boulevard, Oak Park, Ill. Garage.

Pressed Steel.—See Steel, Pressed.

Pressed Steel Mfg. Co.—454 The Bourse, Philadelphia, Pa. Mfrs. steel balls, ball bearings.

Pressed Steel Tank Co.—Milwaukee, Wis. Mfrs. steel boiler shells, tanks.

Pressure.—See Electromotive Force.

Pressure, Back.—See Back-pressure.

Pressure, Electric.—See Electric Pressure.

Pressure-feed Lubricator.—See Lubricator.

Pressure-gauge.—See Gauge, Pressure.

Pressure, High.—See High Pressure.

Pressure, Initial.—The pressure at which steam first enters a steam-engine cylinder, or the pressure of the gas in a gasoline-motor cylinder at the instant after the explosion has occurred.

Pressure, Low.—A term applied especially to a steam-engine in which a vacuum is created on the exhaust side of the piston by the action of the condenser.

Pressure, Mean.—The average pressure in a cylinder during the stroke.

Pressure-regulator.—A device for regulating pressure, such as a valve which reduces a high to a definite low pressure.

Pressure, Terminal.—In a steam-engine, the pressure in the cylinder at the end of a piston-stroke. See Pressure, Initial.

Pressure-valve.—See Valve, Pressure.

Prested Miners' Gas Indicating Electric Lamp Co., Ltd.—Elthorne Rd., Holloway, London N., England. Mfrs. electric lamps, spark plugs, coils, storage batteries.

Presto Detachable Rim.—Lincoln Trust Bldg., room 403, Jersey City, N. J. Mfrs. detachable rims.

Preston Auto Co.—Waitsburg, Wash. (Oldsmobile.)

Prest-O-Ite Co.—20 S. East St., Indianapolis, Ind. Mfrs. Prest-O-Lite, gas tanks and tire inflating tanks. Mem. M. & A. M. Est. 1903. Carl G. Fisher, Pres.; Frank E. Sweet, Vice-Pres.; James A. Allison, Sec. and Treas.

Prestowerke, Gunther und Co.—Zwickaustrasse, Chemnitz, Germany. Mfrs. motorcycles. (Presto.)

Prestwich, John A.—1 Landsdowne Rd., Tottenham, London N., England. Mfrs. motorcycles, tricar. (J. A. P.) Motorcycle motors.

Price Bros.—Huron St., Cleveland, O. (Baker.)

Price, C. W.—Greenfield, O. (Cadillac.)

Price, J. W.—Sec., Treas. and Direc-

tor Neer Air Cooled Engine Co., Plain City, O.

Price, Lawrence.—Pres. The Hildreth Mfg. Co., Lansing, Mich.

Price, P. M.—Johnstown, Pa. (Stearns.)

Prichard, Percy.—Utica, N. Y. (Maxwell.)

Prichard, R. S.—39-41 Gallia Ave., Portsmouth, O. (Winton, Buick, Pope-Waverley.) Est. 189. Garage, 30 cars; repairing.

Priebe Carriage Co., C.—205 S. 4th St., St. Joseph, Mo. (National.)

Primary Battery.—See Battery, Primary.

Primary Cell.—See Cell, Primary.

Primary Generators.—Generators of currents of electricity may be either chemical or mechanical. The former produce a current at the expense of a metal (generally zinc), while mechanical ones produce a current at the expense of the power that drives it. See Cell, Primary and Secondary, and Dynamo and Magneto.

Prime.—To pour a liquid into a pump, carburetter, etc., in order to induce suction.

Priming.—The entrainment of water along with the steam into the cylinder of a steam-engine.

Priming-cup.—A small cup for ejecting a small quantity of kerosene into the cylinder of a gas-motor to facilitate starting.

Priming-valve.—A valve fitted to the cylinder of a steam-engine to afford a vent for water entrained by priming.

Prince, C. E.—Sec. and Treas. The M. Seward & Son Co., New Haven, Conn.

Princeton Garage Co.—Nassau St., Princeton, N. J. (Maxwell.)

Prindle, B. A.—Barre, Vt. (Elmore.)

Prigent, Jules-Marie.—Tours, France. Mfr. jacks.

Prinz & Schneider.—Springville, N. Y. Repairing.

Printz, D. T.—Pres. Reading Standard Co., Water St., Reading, Pa.

Phitchard, R. S.—Portsmouth, O. (Winton.)

Prichett, H. E.—Jacksonville, Fla. (Franklin.)

Privett & Arbuckle.—Greenburg, Ind. Garage.

Probey Carriage Works.—32d and M Sts., Washington, D. C. Repairing.

Procasky, Chas.—411 Main St., Belleville, Ill. (Dorris, Rambler.)

Proctor, E. O.—W. Main St., Ayer, Mass. (Jackson, Logan.)

Proctor-Raymond Mfg. Co.—Detroit, Mich. Mfrs. bells.

Proctor Supply Co., G. H.—31 Stanhope St., Boston, Mass. (Stanley.)

Producer.—A form of furnace for making producer-gas.

Producer-gas.—See Gas-producer.

Professional Chauffeurs' Club of America.—1775 Broadway, New York City.

Progress Cycle Co., Ltd.—Bishopsgate Green, Coventry, England. Mfrs. motorcycles. (Progress.)

Progress Motoren und Apparatenbau Gesellschaft.—39 Wilmersdorferstrasse, Charlottenberg, Germany. Mfrs. motorcycles. (Progress.)

Progressive Mfg. Co.—41 Norwood St., Torrington, Conn. Mfrs. spark plugs. Cap. \$100,000. Est. 1893. J. F. Alvord, Pres.; G. E. Hamman, Sec. and Treas.

Progressive Mfg. Co.—12 S. Poplar St., Pana, Ill. Mfrs. heaters. Est. 1898. E. M. Hybarger, Prop. and Mgr.

Projector, Searchlight.—See Searchlight.

Prony Brake.—See Dynamometer.

Propeller.—Often termed a "screw," or "screw propeller." It consists of a hub or boss mounted on the screw shaft, and to which are screwed two or more blades. The propeller is usually made of manganese bronze.

Propeller-pump.—See Pump, Propeller.

Propeller, Reversible.—A screw propeller, the pitch of which can, by a special arrangement, be rapidly modified not only in its length, but in its direction. Such a screw gives a boat variable forward speeds, and a stoppage and variable reverse speeds.

Propeller-shaft.—The steel shaft which communicates the motions of the motor to the propeller or screw of a boat. The longitudinal force of the shaft is balanced by a "thrust-block." (2) In a shaft-driven motor-car, a universally jointed shaft connecting the motor and the driving-bevel.

Prospect Garage.—3-5 Prospect Park W., Brooklyn, N. Y. Garage.

Prospect Motor Mfg. Co.—7-9 Park Pl., Brooklyn, N. Y. Mfrs. motorcycles.

Prospect Park South Garage.—Coney Island and Church Aves., Brooklyn, N. Y. (Crawford.)

Prosser & Son, Thos.—15 Gold St., New York City; 185 Summer St., Boston, Mass.; Old Colony Bldg., Chicago, Ill. Mfrs. Krupp steel and chrome-nickel steel products.

Prout & Sons, A. H.—Sandusky, O. (Frayer-Miller.)

Prouty, Geo. H.—Barre, Vt. Garage.

Providence Auto Garage.—Broad St., and Potter Ave., Providence, R. I. Garage.

Providence Brass Foundry & Machine Co.—Providence, R. I. Mfrs. brass, aluminum and copper castings, bronze metals.

Providence Motor Car Co.—48 Custom House St., Providence, R. I. Garage.

Providence Steel Castings Co.—164 Allens Ave., Providence, R. I. Mfrs. steel castings.

Provines, Harris G.—Seneca, Mo. (Waltham.)

Prudden & Co., W. K.—Lansing, Mich. Mfrs. wire and wood wheels.

Prunel Frères, Dumas et Cie.—10 Rue de Paris, Puteaux, France. Mfrs. gasoline commercial automobiles, gasoline automobiles. (Prunel.)

Puddling.—The process of converting brittle pig iron into malleable iron by decarbonizing the former and removing the silicon, phosphorus, sulphur, etc., by atmospheric oxidation.

Pueblo Automobile Co.—Cor. Court and 4th Sts., Pueblo, Colo. (Pope-Waverley, Dragon, Ford.)

Pueblo Electric Co.—117 W. 4th St., Pueblo, Colo. (Frayer-Miller, Cameron.)

Pueblo Novelty Works.—310 N. Main St., Pueblo, Colo. (Rambler.)

Puget Sound Auto Co.—1405-7 Broadway, Seattle, Wash. (National, Rambler, Commerce trucks.) Est. 1905. Cap. \$50,000. Fred T. Evans, Pres.; T. F. Ryan, Vice-Pres.; A. U. Heinzerling, Sec., Treas. and Gen. Mgr. Garage, 20 cars; repairing.

Pugh Bros.—15 Snow St., Providence, R. I. (Corbin, Elmore)

Pulicu, A. J.—Supt. Detroit Steel Products Co., 91 E. Fort St., Detroit, Mich.

Pullen & Co., F. A.—7 St. Martin's Lane, Cannon St., London, England. Mfrs. circulating pumps.

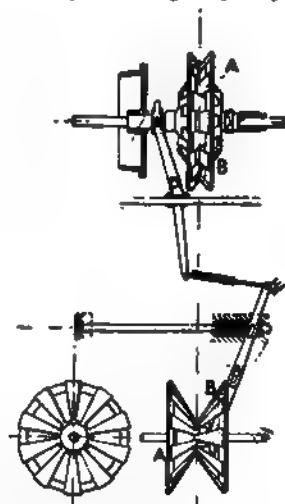
Pulley.—A hoisting device consisting of a small hardwood or metal wheel called a "sheave" with a groove called a "gorge" on its periphery in which runs a cord, rope or chain, and turning on a "pin" or "pin-tle" between two "cheeks" of wood or metal forming a "shell" or "block." A combination of two or more blocks, one of which is attached to the load to be raised, is called a "tackle" The rope passed

through the "swallow" or "channel" (or space between the pulley and through the block), is said to be "roven," and that part of it to which the power is applied is termed the "fall." A pulley hoist is necessary for the proper handling of power-boats, machinery and all

heavy weights. It enables one person to handle an object that would ordinarily require many. (2) A general term for a small wheel. (3) A wheel on a shaft driven by a belt, or the like. Sometimes called a "belt-pulley."

Pulley, Cone.—See Pulley, Stepped.

Pulley, Expanding.—A form of pulley devised by M. Foullaron for progressively varying the speed of a motor-vehicle, and the arrangement of which is shown in the accompanying figure. These pulleys are connected by a leather belt of special construction and are formed of two conical wheels, A and B, the spokes of which fit into each other like the interlocking fingers of two hands, thereby forming a pulley of tri-

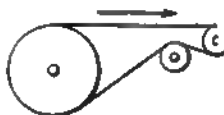


angular section. One of the halves, A, is movable. By sliding it back and forth the diameter of the pulley may be varied at will. The same lever shifts both pulleys, increasing the size of one and decreasing that of the other, thus maintaining the belt-length constant. In this way the speed of the car may be easily varied without the friction-loss of ordinary gearing. Instead of the three or four speeds which are obtained in the usual transmission, the speed may be varied gradually and without shock within the speed limits.

Pulley, Fast.—A pulley keyed to a shaft and always rotating with it, as distinguished from a "loose" or "idle pulley," which revolves freely on the shaft. Fast and loose pulleys are used side by side, so that a belt can be shifted from one to the other to stop or start a machine.

Pulley, Jockey.

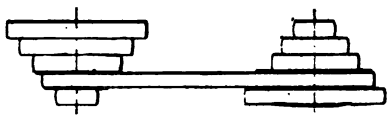
—A small pulley for exerting a pressure against the idle or slack side of a belt or chain in order to keep it taut.



Pulley, Loose.—See "fast pulley."

Pulley, Speed.—See Pulley, Stepped.

Pulley, Stepped.—A pulley in the form of a stepped cone, so that the velocity can be varied by shifting a belt from a larger to a smaller circumference. "Stepped pulleys," called also "cone pulleys," and "speed pulleys," are not much used on automobiles on account of the liability of the belts to slide and the space they require. Among the rare cases in which stepped pulley shafts



have been employed for the transmission and change of speed in a motor-car may be mentioned the Darracq-Bollée car, which is widely used in France. In this case, the belt is shifted on oppositely tapered pulley cones by means of an ordinary shifter, and by this means five speeds forward can readily be obtained, without the jar and friction experienced with some other types of speed-gear.

Pullman Auto Agency.—7 Motor Mart, Park Sq., Boston, Mass. (Pennsylvania, Pullman, Northern.) N. L. Rush, Mgr. Repairing.

Pullman, C. R.—Little Rock, Ark. (Logan.)

Pullman Motor & Vehicle Co.—Fisher Bldg., Chicago, Ill. (Model.)

Pullman Motor Car Co.—W. S. Duvall, Pres., Loan & Trust Bldg., Washington, D. C. (Pullman Flyer.)

Pullman Motor Car Co.—Portland, Oreg. (Jackson.)

Pullman Motor Car Co.—1140 S. Main St., Los Angeles, Cal. (Pullman Flyer.)

Pullman Motor Car Co.—131-33 La Salle St., Chicago, Ill. Mfrs. gasoline automobiles. (Pullman Flyer.)

Pullman, Ltd., R. & J.—Westbrook Mills, Godalming, Surrey, England. Mfrs. non-skids, leather tires.

Pullwin Wheel Co., The.—37 Colony St., Meriden, Conn. Mfrs. wood wheels.

Pumice Stone.—Volcanic scoria, spongy or cellular from bubbles of steam or gas which it contained during the liquid state. Powdered pumice is used for rubbing down varnished surfaces in order to obtain a perfectly smooth ground for subsequent coats of varnish, and as an abrasive for grinding valves, etc.

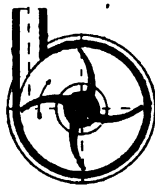
Pump.—An apparatus for raising, circulating, exhausting or compressing a fluid. The pumps used in automobilism are usually one of four varieties: Centrifugal, gear, plunger or vane.

Pump, Air.—A small pump driven from the cam-shaft to create pressure whereby oil is raised from the main oil tank to the mechanical lubricator, and gasoline

from the main gasoline tank to the auxiliary tank.

Pump, Bilge.—A pump for drawing off bilge-water.

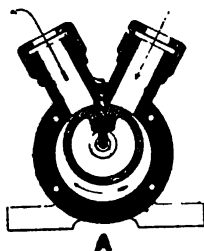
Pump, Centrifugal.—The centrifugal pumps employed in automobilism effect the circulation of the water in the conduit by communicating to it in the interior of the pump, a velocity converted into pressure in the collecting volute. The moving portion consists of a number of curved blades



mounted on an axle by which they are set in rapid rotation. This part is contained in a circular casing provided with inlets at the center and a wide outlet at the circumference running in a tangential direction. The water fills the casing and is set in rotation by the blades. Centrifugal force drives it outward, and it flows through the discharge-pipe in a steady stream, while fresh water is continually drawn in through the inlet-pipe.

Pump, Eccentric.—A pump composed of a circular casing or drum having a

smaller drum within journaled out of the center of the casing, one side of which it nearly touches. Within the smaller drum there are four vanes or paddles which spring out and make contact



with the sides of the casing as the drum revolves. Water entering the side of the casing most remote from the drum fills the opening between the paddles, and as the drum revolves, is forced into the smaller space containing the outlet.

Pump, Feed.—A pump for feeding water or oil; especially the pump that supplies water to a steam boiler.

Pump, Force.—The same as Plunger Pump.

Pump, Gear.—The same as Rotary Pump, q. v.

Pump-governor.—See Governor, Pump.

Pump, Grease.—An injector for forcing grease into a bearing.

Pump, Lever.—A pump, single or compound, worked by a hand-lever, and used for inflating tires.

Pump, Plunger.—A reciprocating pump provided with a solid cylindrical plunger having a reciprocating piston or plunger working with a cylinder.

Pump, Propeller.—A type of pump in which the vanes are so arranged that

they not only throw the water out by centrifugal action, but act also as a kind of screw, in the same manner as a propeller screw, and drive the water from the inlet to the outlet pipe.

Pump, Rotary.—A pump, usually called a "gear-pump," which consists of two



rotating members gearing with each other after the manner of two pinions. These revolve in a casing which exactly fits their contours, so as to af-

ford no space for the passage of water around them. When the pump is rotated at high speed, the water is forcibly discharged by centrifugal action.

Pump, Steam.—A type of pump used on steam-cars for feeding water to the boiler and for maintaining a constant pressure of air in the gasoline tank of such cars

Pump, Suction.—See Pump, Piston.

Pump, Tire.—A pump for inflating pneumatic tires. The figure represents a very simple form of air-pump provided with a force-valve. In the pump chamber, A, moves a piston, B, having a certain amount of play. A leather ring, C, performs the functions of piston-packing and suction valve. At D is a check-valve to prevent a return of the expelled air.



Pump, Vane.—The same as eccentric-pump. See Pump, Eccentric.

Punch.—A steel tool used for forming holes in thin metal, and having a strong and well-tempered point. Apart from this, it is used for a variety of purposes, among others, for marking pieces to be dismounted. In this case it is called a "prick-punch."



Punch, Center.—A small type of punch for marking centers.

Punctureproof Tire Co.—Guardian Bldg., 322 Euclid Ave., Cleveland, O. Mfrs. cushion tires for commercial wagons and pleasure cars. Cap. \$100,000. Est. Sept. 1, 1906. Chas. O. Evants, Pres.; Chas. P. Salen, Vice-Pres.; Frank F. Gentach, Sec. Treas. and Gen. Mgr. Chicago Branch, 1461 Michigan Ave.

Pungs-Finch Auto & Gas Engine Co.—1524 Jefferson Ave., Detroit, Mich. Makers of the Pungs-Finch car; first marketed in 1902. Six models made since. Cap. \$150,000. W. A. Pungs, Pres.; Gen. Mgr.; Designer, Sales and Advt. Mgr.; D. C. Rexford, Vice-Pres.; E. B. Finch, Sec. and Treas.; Fred Henning, Supt. and Purch. Agt.; Gus. Eckert, A. st. Supt. Agents and dealers: Colon-

ial Auto Co., Pittsburg, Pa.; Euclid Garage, Cleveland, O.

Pupki Garage.—488 Hancock St., Brooklyn, N. Y. Garage.

Purge-cock.—See Cock, Purge.

Puritan Machine Co.—12-16 Gratiot Ave., Detroit, Mich. Mfrs. engines, steering gears, transmissions, pumps, special work to order, special automobile machinery. Cap. \$30,000. Est. since 1900. Alfred O. Dunk, Treas., Designer and Gen. Mgr.; Thomas H. Dunk, Sec.; Jacob Schiemer, Gen. Supt.; A. D. Lootens, Experimental Dept.; J. L. Schoonfeldt, Machine Shop.

Puritan Motor Co.—43 Columbus Ave., Boston, Mass. (Dolson, Mason.)

Puritan Soap Co.—500-504 Exchange St., Rochester, N. Y. Mfrs. automobile soaps, metal polish. Cap. \$100,000. Est. May, 1903. John C. Bertrand, Vice-Pres. and Gen. Mgr.; Harry C. Green, Sec. and Treas.

Purington, A. B.—126 Exchange St., Bangor, Me. (Columbia.) Supplies; garage; repairing.

Purrey, V.—1-31 Bvd. J. J. Bosc, Bordeaux, France. Mfr. steam commercial automobiles. (Purrey trucks and omnibus.)

Push.—A contact-maker actuated by a stud which is pushed in by the finger, and, when released, is forced out again by a spring and breaks the circuit.

Push-button.—See Button, Push.

Push-pedal.—See Pedal, Push.

Push-rod.—A small hardened steel rod, which, on being lifted by a rotating cam, comes into contact with the stem of an inlet or exhaust-valve and causes the latter to open.

Putnam, C. M.—Moriah, N. Y. (Waltham.)

Putnam Garage Co.—Putnam, Conn (Jackson.)

Putnam, H. E.—Pres. Gies Gear Co., 345-347 Bellevue Ave., Detroit, Mich.

Putnam, H. F.—Treas. Putnam Motor Mfg. Co., 57 Lebanon St., Springfield, Mass.

Putnam Motor Mfg. Co.—57 Lebanon St., Springfield, Mass. Mfrs. motor cycle motors, automobile and marine motors, carburetters, kerosene carburetters. Inc. Est. 1907. R. H. Putnam, Pres.; H. F. Putnam, Treas.; E. J. Dickey, Clerk.

Putnam, R. H.—Pres. Putnam Motor Mfg. Co., 57 Lebanon St., Springfield, Mass.

Putney Motor Co., Ltd.—17 Grand Parade, Upper Richmond Rd., London, S. W., England Mfrs. automobile motors.

Putts.—76 Washington St., Salem, Mass. Garage.

Putzel, Morris.—Macon, Ga. (Ford.)

Pyle Mfg. Co.—2211 Park Ave., Indianapolis, Ind. Mfrs. acetylene generators, adjustable lamp brackets, lamps.

Pyott, A. M.—Belmar, N. J. Garage.

Pyralin.—A transparent flexible material designed to be sewn into the curtains of a boat or automobile in order to give light, and also to serve as a lookout.

Pyramid Garage Co.—36-38 W. 62d St., New York City. Garage.

Pyramid Motor Car Co.—31 New St., Danbury, Conn. (White, Pope-Toledo, Pope-Waverley, Pope-Hartford, Cadillac.)

Pyrolusite.—See Manganese, Binoxide.

Pyrometer.—A form of thermometer especially designed for the measurement of very high temperatures that the ordinary instrument would not withstand.

Q

Q q.—Symbol for "quantity" especially quantity of electricity.

Quackenbush Co., W. H.—Westfield, N. J. (Reo, Premier, Mitchell, Ford, Maxwell.)

Quackenbush, James N.—Sec. Twentieth Century Mfg. Co., 19 Warren St., New York City.

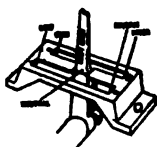
Quackenbush, W. F.—1287 Madison Ave., New York City. Repairing.

Quad.—A light, low-priced, four-wheel motor vehicle; an abbreviation of "quadricycle."

Quad-coil.—See Coil, Quad.

Quad Mfg. Co., The.—35-37 S. Scioto St., Columbus, O. Mfrs. timers. Est. November, 1905. Officers: M. H. Budd, Jr., W. E. Ranny and W. A. Vause.

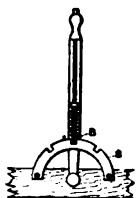
Quadrant, Gate.—A change-speed lever-quadrant, which, in place of notches, is provided with longitudinal slots, called "gates," into one or the other of which the change-speed lever moves to engage the different speeds and reverse. Ordinarily, the car is left



with the shift-lever in the neutral position (see figure, which illustrates a four-speed quadrant). In order to obtain the first speed, the lever is pushed forward as far as it will go, and, to obtain the second, is pulled back as far as possible in the same gate. The third and fourth speeds are obtained by drawing the lever into the inner gate; the third speed being secured by pushing it forward as far as it will go and the fourth by reversing the operation.

Quadrant, Gridiron.—See Quadrant, Gate.

Quadrant, H.—See Quadrant, Gate.



Quadrant, Notched.—A quadrant provided with notches by which to lock in position the lever (change-speed and emergency-brake levers, e. g.) that work over it.

Quaker City Automobile Co.—138-146 N. Broad St., Philadelphia, Pa. Branch at Atlantic City, N. J. (Pope-Toledo, Pope-Hartford, Pope-Waverley. Peerless, Franklin.) Est. 1903. Cap. \$25,-

000. Percy L. Neef, Pres.; James R. Shock, Sec.; Henry R. Shock, Treas.; R. J. Skilton, Mgr. Garage, 250 cars. Repairing.

Quaker City Motor Club.—Philadelphia, Pa. H. C. Harback, Sec.

Quality Lever.—See Lever, Quality.

Quantity Lever.—See Lever, Quantity.

Quartz-fibers.—Fine fibers produced by rapidly drawing out a piece of quartz when fused in the oxyhydrogen flame. Such fibers, on account of their strength and elasticity, are used in very sensitive galvanometers, electrometers, and other instruments containing moving parts which require delicate suspension.

Quebec Automobile & Launch Co.—Cor. St. Augustin and St. Patrick, Quebec, Canada. (Russell, Reo, Ford, Pope-Toledo, Pope-Hartford, Pope-Waverley.

Queen & Co., Inc.—8th and Arch Sts., Philadelphia, Pa. Mfrs. ammeters and voltmeters, spark coils, sparking points.

Queen City Automobile Co.—538 W. McMicken Ave., Cincinnati, O. (Knox, Waltham.)

Queen City Automobile Repair Works.—2201-3 Second Ave., Seattle, Wash. (Reliance.)

Queen City Brass & Iron Works.—Cincinnati, O. Mfrs. brass-pipe fittings.

Queen City Garage.—2203 72nd Ave., Seattle, Wash. (Apperson).

Quenching.—The sudden cooling of steel by plunging it, while red hot, into water, whereby it becomes extremely hard.

Quicksilver.—See Mercury.

Quill.—A short pipe which receives the ends of two other pipes; a sleeve-coupling or sleeve-nut.

Quinby & Co., J. M.—21-39 Division St., Newark, N. J. Mfrs. and automobile dealers in aluminum bodies, tops, and storm covers, wooden and metallic bodies. (Panhard and Renault.) Est. 1834. W. W. Ogden, Pres.; Emerson Brooks, Vice-Pres.; Henry D. Ogden, Treas., and H. W. Suffern, Sec.; W. W. Ogden, Gen. Mgr., and Geo. S. Jephson, Asst. Gen. Mgr.

Quincy Automobile Co.—Quincy, Ill. (White.)

Quincy Manchester Sargent Co.—84 Van Buren St., Chicago, Ill. Mfrs. au-

tomobile wrenches and automobile treads.

Quinlan, T. A., Jr.—Pres. and Gen. Mgr. Monarch Motor Car Co., Chicago Heights, Ill.

Quinn & Co., T. H.—Straight, Pa. (White.)

Quinn, James A.—300½ W. 54th St., New York City. Garage.

Quinn, Peter J.—Officer, Delta Mfg. Co., Bloomfield, N. J.

Quinsler & Co.—26-30 Cambria St., Boston, Mass. Mfrs. wooden and metallic bodies. Garage.

Quint & Sons, S. H.—15 S. 4th St., Philadelphia, Pa. Mfrs. name plates, steel stamps and stencils.

Quirk, Wm. T.—Big Rapids, Mich. (Northern.)

Quogue Automobile & Bicycle Co.—Jessop Ave., Quogue, L. I., N. Y. Garage, repairing and supplies.

R

R.—Symbol for "reluctance."

R.—Symbol for "resistance."

r. p. m.—An abbreviation for "revolutions per minute."

Raban-Johnston.—34 Broad St., Port Chester, N. Y. (Reo, Premier.)

Rabbet.—An angular incision cut longitudinally in a piece of timber in vessels to receive the ends of a number of planks to be fastened therein. Written also "rebate."

Rabeneau, Edwin.—Iowa City, Ia. Garage.

Rabenold, W. F.—Home address, 28 N. 11th St. Office, 1207 Hamilton St. Garage, 12th and Court Sts., Allentown, Pa. (American Berliet, Dolson, Dragon.) Est. 1906. Garage, 70 cars. Repairing.

Race.—The path of the balls or rollers in anti-friction bearings. See Ball-race.

Racer.—See Boat, Racing. (2) A term sometimes applied to certain parts of machines which move with very great speed.

Racine Boat Co.—16th and Racine Sts., Racine, Wis. Cap. \$15,000. P. M. Godske, Pres., Gen. Mgr. and Designer; F. W. Hermans, Vice-Pres.; G. G. Roberts, Sec., Treas., Pur. Agt., Sales and Advt. Mgr. Mfrs. motor boats.

Racine Boat Mfg. Co.—Muskegon, Mich. Makers of "Racine" power boats. First marketed 1882. New models made every year. Cap. \$250,000. Walter J. Reynolds, Pres., Treas., Gen. Mgr. and Sales Mgr.; Paul B. McCracken, Vice-Pres.; William W. Butterfield, Sec.; William E. Collier, Designer and Supt.; John J. DeVine, Purch. Agt.; T. Raymond Stahl, Adv. Mgr.

Racine Brass & Iron Co.—Racine, Wis. Mfrs. brass, bronze, aluminum and copper castings, and gray iron castings.

Racine Engine & Machinery Co.—Racine, Wis. Mfrs. steam engines.

Racine Malleable & Wrought Iron Co.—Racine, Wis. Mfrs. malleable iron castings.

Racine Novelty Mfg. Co.—600 6th St., Racine, Wis. Mfrs. storm aprons and curtains, wooden and metallic bodies, battery boxes, spark coil boxes, tool boxes, dashes and fenders, and automobile tops.

Racing.—Uncontrolled increase in the

speed of a motor when the governor fails to act properly. In marine engines, racing occurs if the screw-propeller is lifted out of the water by the motion of the vessel in rough weather.

Racing Boat.—See Boat, Racing.

Rack.—A bar, either straight or slightly curved, with gear-teeth cut in it. See Rack and Pinion.

Rack and Pinion.—A device for converting the rotary motion of a shaft into linear motion by means of a pinion keyed upon the shaft and meshing with a rack. See Gear, Rack.

Rack, Circular.—A rack attached to the inner face of the rear wheel of a motor-vehicle and engaging with pinions actuated by the motor.

Rack, Segment.—A rack operating with a segment-gear.

Racouard-Rocher.—26 rue, National, chateau-du-Loire, Sarthe, France. Mfrs. La Castellorienne motorcycles.

Radax Pneumatic Tyre Co., Ltd.—51 Fountain St., Manchester, England. Mfrs. pneumatic tires.

Radel Leather Mfg. Co.—Hamburg Place Road, Newark, N. J. Mfrs. leather.

Radia.—12 rue Barbès, Levallois, Paris, France. Mfrs. gasoline automobiles. (Radia.)

Radial Bearing.—See Bearing, Radial.

Radial Bearing Co.—508 Broad St., Bank Bldg., Trenton, N. J. Mfrs. radial bearings.

Radian.—The unit employed in the measurement of angles. A "radian" is an angle that embraces an arc of circumference equal to the length of the radius of such circumference.

Radiation.—The direct transmission of heat through any medium whatever, without the conductivity of such medium intervening. Heat (solar heat, for example) is transmitted in space by radiation. In principle, the heat transmitted by radiation is always greater than that transmitted by conductivity. When exceptions to this rule are found, as in the case of heating by a hot-air stove or radiator, it is because they are due to "convection" or active circulation of the surrounding air by escapement.

Radiator.—An apparatus designed to

produce an exchange of temperature between two fluids by means of a radiating metallic surface. On automobiles it serves to cool the water that prevents the motor from reaching too high a temperature.

Radiators are of two general types, tubular and honeycomb. Both of these are provided with tubes, but in the former the water passes through the tubes, which are formed into a coil (Fig. 1), while in

the latter the tubes are traversed by air. In the first-named type the tubes, which are of brass or copper, are usually cylindrical and provided with circular or square sheet copper (or sometimes tin or iron) "gills" or "fins" (Fig.

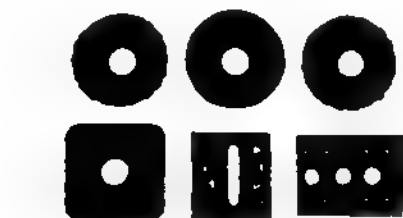


Fig. 2.

2), which are simply let over the tube and soldered to it; or with one continuous fin of thin corrugated copper ribbon wound spirally around it and sweated on



Fig. 3.

at the base (Fig. 3); or are surrounded with coils of helical wire. Since heat is dissipated from a point, edge or projection, more readily than from a smooth surface, the fins are made with perforations or projections, or both, and they, as well as the tubes, are coated with lamp-black, which is highly convective

In high-powered cars, the tubes are often flattened, a form which, although more expensive, is more efficient for the same length of tubing. In flat-tube radiators (Fig. 4), the water most generally passes through each entire bank of tubes at the same time, and the tubes are provided with fins which are continuous from front to back over each entire bank. The value of the continuous fin from front to rear is that it furnishes a continuous medium for the heat from the rear, or hottest part, to travel to the



Fig. 4.

front, or coldest part. Radiators are also made with vertical tubes (Fig. 5) running from a top to a bottom tank. Any form of tubing can be set in such a position, but this arrangement is scarcely desirable where a pump is used. In all tubular radiators the water circulation is of the greatest importance. A tank is necessary to act as a sort of stand-pipe to take up evaporation, and a pump also, except in some vertical tube arrangements.

The second type of radiator, the honeycomb (Fig. 6), consists essentially of a tank $3\frac{1}{2}$ to $4\frac{1}{2}$ inches deep, of which the plane walls are connected by a large number of thin brass tubes of square or circular section, and traversed by air, which is drawn through them by a fan or by the motion of the vehicle. This space between the tubes contains the water to be cooled.



Fig. 5.

The characteristic of the honeycomb is that it has a perfectly free lateral as well as vertical circulation, so that the water can move in thermal currents from any part of the apparatus to any other part irrespective of the action of the pump.



Fig. 6.

Radiator, Cellular.—See Radiator.
Radiator, Honeycomb.—See Radiator.
Radiator, Spiral Fin.—See Radiator.
Radiator, Tubular.—See Radiator.

Radiguet, G.—97 Ave d'Italie, Paris, France. Mfr. motorcycles.
Radius-rod.—A rod, called also a "distance rod," used to keep the rise and fall of the driving axle of a motor-vehicle from slackening or tightening the chain or other driving arrangement. It consists of a strut pivoted at the center, so that its other extremity moves along an arc described from the center, thus keeping the parts to which the strut is attached at a fixed distance apart.

Radkey, S. B.—Cor W. 5th and Colorado Sts., Austin, Tex. (Holsman).
Rae, O. & J. M.—106 Falls St., Niagara Falls, N. Y. (Ford.)
Rafer fils Frères.—St. Chamond, Loire, France. Mfrs. chains.
Rafferty, S. W.—Vice-Pres. and Traveling Salesman, National Spring & Wire Co., Albion, Mich.

Rag-bolt.—See Bolt, Rag.
Rahe, A. C.—Sec. Tray Plate Battery Co., 5 Frederick St., Binghamton, N. Y.
Rahmann & Co., Geo.—6 Ferry St., New York City. Mfrs. belting.

Rahway Appliance Mfg. Co.—12 Plain St., Albany, N. Y. Garage.

Rail.—One of the two longitudinal members, of a motor-vehicle frame. See Side-member, Reach, Sill and Girder.

Raimes & Co.—50 Ferry St., New York City. Mfrs. metal polishes.

Rainier Agency.—559 7th Ave., Pittsburgh, Pa. (Rainier.)

Rainier, John T.—Pres. and Treas. Rainier Co., Broadway and 56th St., New York City.

Rainier Motor Car Co., The.—Broadway, cor. 56th St., New York City. Factory, Saginaw, Mich. Makers of the Rainier car. First marketed in 1905. Three models made since. Cap. \$1,000,000. John T. Rainier, Pres. and Treas.; Paul N. Lineberger, Vice-Pres., Gen. Mgr., Sales and Advt. Mgr.; Jas. G. Haerlet, Designer; J. L. Davison, Supt.; W. S. Miller, Purch. Agt.; Ezra E. Kirk, Western Mgr. of Sales. Chicago Branch, 1725 Michigan Ave. Garage in connection with New York offices to house 100 cars; repairing. Agents and dealers: Auto Motor Car Co., 804 Sycamore St., Cincinnati, O.; Braschi, H. J., Mexico City, Mex.; Morrison & Price Co., 169 Huntington Ave., Boston, Mass.; Coburn & Belden, 577 Central Ave., Newark, N. J.; Rainier Agency, 559 7th Ave., Pittsburgh, Pa.; Hayes, A. H., 428 Golden Gate Ave., San Francisco, Cal.; Northway, Thos. J., 92 Exchange St., Rochester, N. Y.; Smith Bros., Los Angeles, Cal.; Julius Lesser, St. Louis, Mo.

Rainier Motor Car Co.—1725 Michigan Ave., Chicago, Ill. (Rainier.)

Rainis Automobile Co.—W. Adams St., Jacksonville, Fla. Garage.

Rajah Auto Supply Co.—147 Washington St., New York City. Mfrs. spark plugs and wire terminals.

Rake.—In a boat, the inward slope of bow or stern from rail to keel; (2) in a motor vehicle, an incline from the perpendicular, as the "rake" of a steering-post, or of a hood, etc.

Raleigh Cycle Co., Ltd.—Nottingham, England. Mfrs. motorcycles. (Raleigh.)

Ralph, W. I.—Advt. Dept., The Automobile. Flatiron Bldg., New York City.

Ralston, J. C.—Sec. The Beckley-Ralston Co., 80-84 Michigan Ave., Chicago, Ill.

Ramaley, F. W.—650 Grand Ave., St. Paul, Minn. (Stoddard-Dayton, Rauch and Lang.)

Rambler Auto Agency.—707 Pacific Ave., Tacoma, Wash. (Rambler.)

Rambler Auto Co.—101 Fulton St., Syracuse, N. Y. (Rambler.)

Rambler Automobile Co.—1506 Capitol Ave., Omaha, Neb. (Rambler.)

Rambler Automobile Co.—2044 Farman St., Omaha, Neb. (Mitchell.)

Rambler Garage.—1218 Sheridan Rd., Chicago, Ill. Garage.

Rambler Motor Car Co.—Halsey and Crawford Sts., Newark, N. J. Repairing.

Ramer, Geo. F.—Asst. Purch. Agt. Aperson Bros. Automobile Co., Kokomo, Ind.

Ramier et Mauberqué.—109 rue de Paris, Puteaux, France. Mfrs. radiators.

Ramsay, B. S.—Plattsburg, N. Y. (Waltham.)

Ramsey-Hutchins Co.—1048 S. Main St., Los Angeles, Cal. (Pierce-Racine.)

Ramsey Mfg. Co.—472 Bullitt Bldg., 4th and Walnut Sts., Philadelphia, Pa. Mfrs. engines.

Ramsey, Robert.—Sec. Citizen's Motor Car Co., N. E. cor. Seventh and Main Sts., Cincinnati, O.

Ramsey, Wm. E.—Treas. National Auto Co., 957 Main St., Los Angeles, Cal.

Rand & Harvey.—Elizabeth St., Lewistown, Me. (Stanley.)

Rand Auto Co., The F. L.—112 Ashland St., North Adams, Mass. Garage.

Randall, A. G.—109 N. 11th St., Boise, Idaho. (Buick, Waltham.) Est. Nov. 1906. Garage. 10 cars. Repairing.

Randall, A. W.—Jones St., Port Jefferson, N. Y. Garage.

Randall Co., Frederick E.—245 Columbus Ave., Boston, Mass. (Pullman, Stevens-Duryea.)

Randall-Faichney Co.—Boston, Mass. Mfrs. oil guns.

Randall, G. N.—1094 French St., Meadville, Pa. Mfrs. steam engines.

Randall Motor Car Co.—216 Berry St., Ft. Wayne, Ind. (Stoddard-Dayton, Mitchell, Ford, Rambler, Model.)

Randal, W. C.—Clerical Dept., Harrisburg Auto Co., 3d and Hamilton Sts., Harrisburg, Pa.

Randliff Motor Car Co.—893 Boylston St., Boston, Mass. (Panhard.)

Randolph, Asa F.—Sec. and Treas. Spicer Universal Joint Mfg. Co., Third St. and Madison Ave., Plainfield, N. J.

Randolph-Clowes Co.—Waterbury, Conn. Mfrs. sheet and rod brass and copper, brass and copper metals, rods, tubing, copper boiler shells.

Randolph, S. F., Jr.—Pres. Ventilated Cushion & Spring Co., Jackson, Mich.

Randolph, T.—Nyack, N. Y. (Holzman.)

Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich. Mfrs. wood and metallic bodies, body irons, bow separators, bow sockets, foot rests, adjustable lamp brackets, robe rails, fire holders, automobile tops, metal trimmings, trunk racks, glass wind shields.

Rankin, D.—Partner, Tarkio Electric & Water Co., Tarkio, Mo.

Rankin, W. F.—Partner, Tarkio Electric & Water Co., Tarkio, Mo.

Ranlet Automobile Co.—76 Eastern Ave., St. Johnsbury, Vt. Mfrs. feed-water heaters. (Stanley.)

Ranney, A. Elliott.—Partner, A. Elliott Ranney & Co., 1851 Broadway, New York City.

Ranney & Co., A. Elliott.—1851 Broadway, New York City, 237 Halsey St., Newark, N. J. (Elmore.) Est. 1899. Cap. \$50,000. Partners: A. Elliott Ranney and A. M. Day. Repairing, garage.

Ranney, E. C.—Purch. Agt. Winton Motor Carriage Co., Cleveland, O.

Ranney, W. E.—Officer, The Quad Mfg. Co., 37 S. Scioto St., Columbus, O.

Ransomes, Sims & Jeffries, Ltd.—Ipswich, England. Mfrs. agriculture implements, lawn mowers.

Rapid Akkumulatoren und Motorenwerke.—Hauptstrasse 140, Berlin, Schöneberg, Germany. Mfrs. storage batteries and coils.

Rapid Motor Vehicle Co.—Rapid St., Pontiac, Mich. Makers of the Rapid delivery wagons, trucks, busses, sight-seeing cars, ambulances, and every type of vehicle in the commercial vehicle line. First marketed in 1899. Three models of chassis made since. Cap. \$250,000. A. G. North, Pres.; Max Grabowsky, Vice-Pres. and Designer; H. G. Hamilton, Treas. and Gen. Mgr.; Morris Grabowsky, Sec. and Purch. Agt.; D. J. Moreland, Supt.; T. P. Myers, Advt. Mgr.; Wm. Parkins, Chief of Eng. Dept. Agents and dealers: Allegheny Auto Co., 713 Jackson St., Allegheny, Pa. Walter G. Benz, 246 3d Ave., Minneapolis, Minn. Brockton Auto Exchange, 51 Ward St., Brockton, Mass. Butler Motor Car Co., Copley St. Garage, Harcourt St. Side, Boston, Mass. A. A. Chapin, 1st and M Sts., N. E., Washington, D. C. Duff & Gregg, Nebraska City, Neb. D. O. Eaton, 236 N. Broad St., Philadelphia, Pa. Fellwock Auto & Mfg. Co., 210 E. Pa. St., Evansville, Ind. Galveston Motor Car Co., Galveston, Tex. Henderson Auto Co., Cedar Rapids, Ia. Idaho Automobile & Electric Trans. Co., room 306, Bank and Ins. Bldg., Dubuque, Ia. Indianapolis Motor Car Co., 111 Kentucky Ave., Indianapolis, Ind. P. A. Johnson, East Side Prospect Sq., Cambridge, Ill. Keystone Motor Car Co., 109 Market St., Harrisburg, Pa. W. J. Massey Auto & Bicycle Co., Vancouver, B. C. Jos. Maw & Co., Winnipeg, Canada. Meade McClatchey, 71 E. Side Square, Canton, Ill. Mohler & De Gress, La Independencia 12, Mexico City, Mex. J. E. Neumann, 1841 Market St., San Francisco, Cal. Pittsfield Auto Garage Co., 228 N St., Pittsfield, Mass. J. R. Richardson, 11th and West Sts., Wilmington, Del. Rodgers & Co., 710 Gay St., Knoxville, Tenn. C. M. Rodgers, 437 Pearl St., Buffalo, N. Y. Schaffer Mfg. Co., 308 N. Calvert St.,

Baltimore, Md. W. Cary Smith & Co., 98 W. Lincoln Ave., Mt. Vernon, N. Y. J. L. Swartz & Co., Bridgeton, N. J. care of W. Howard Garrison, 53½ E. Commerce St., Bridgeton, N. J. H. W. Thornhill & Co., 290 Elm St., Dallas, Tex. Tyrone Motor Car Co., Tyrone, Pa. Wilson Auto Co., 117 Craig St., Montreal, Canada. Wm. Smith, Jersey City, N. J. H. G. W. Spurling, Hamilton, Bermuda. Goodyear Rubber & Tire Co., Akron, O. W. B. Brouse, Massena, N. Y. Ralph Temple Auto Co., 1219 Michigan Ave., Chicago, Ill. Auto Motor Car Co., 804 Sycamore Ave., Cincinnati, O. Temple Auto Co., Temple Tex.

Rapid Societa Torinese Automobili.—Barriers di Nazza, Turin, Italy. Mfrs. gasoline commercial automobiles and gasoline automobiles. (Rapid.)

Rapiditas.—Pub. at 2 via Catania, Palermo, Italy.

Rarig Auto & Garage Co.—466 20th St., Oakland, Cal., and 538 Golden Gate Ave., San Francisco. (Queen, National, Jackson.)

Raritan Automobile & Motor Co.—Perth Amboy, N. J. Garage.

Raritan Woolen Mills.—14 White St., New York City. Mfrs. cloth and carpet trimmings.

Raser, H. F.—609 French St., Erie, Pa. Garage.

Raser Tanning Co.—Ashtabula, O. Mfrs. leather.

Rasp.—See File.

Rast, J. H.—Pres. Treas. and Mgr. Army Cycle Mfg. Co., 130-132 Meeting St., Charleston, S. C.

Rastetter & Son, Louis.—Fort Wayne, Ind. Mfrs. wood rims, steering wheels and wire wheels.

Ratchet.—A mechanism consisting of a ratchet-wheel and pawl. (2) The pawl in such a mechanism. (3) The toothed wheel used in such a mechanism. (4) A ratchet-brace or ratchet-drill.

Ratchet, Safety.—A device fitted in the hubs of the rear wheels of a motor vehicle by which they can be locked so as to prevent a backing down hill. See Sprag.

Ratchet-sprag.—See Sprag.

Ratchet-wheel.—A toothed wheel of which the teeth all point in one direction and with which engages a pawl that permits it to revolve in one direction, or prevents it from turning. It is in this last form that the ratchet-wheel is employed as a "sprag" in certain types of automobiles. See Click.

Rath Mfg. Co.—Hancock, Laurel and Second Sts., Philadelphia, Pa. Mfrs. metal polishes.

Rathbun House Garage.—Exchange St., Elmira, N. Y. Garage.

Rathbun-Lacy Co.—Toledo, O. Mfrs. gasoline marine motors.

Rating, Motor-boat.—See Boat, Racing.

Ratio, Driving-gear.—On chain-driven cars, the driving sprockets are smaller than those driven, and the "driving ratio," as it is termed, varies from $1\frac{1}{2}$ to $3\frac{1}{4}$, or, in other words, the wheels revolve once while the driving-shaft or sprocket makes from $1\frac{1}{2}$ to $3\frac{1}{4}$ revolutions. Other things equal, a higher driving-gear gives the car lower speed, but greater ability in hill-climbing and traversing heavy roads.

Rattliff, J. H.—Gen. Mgr. and Sec. The Auto Motor Car Co., 804-808 Sycamore St., Cincinnati, O.

Rattan Mfg. Co.—522 State St., New Haven, Conn. Mfrs. hampers.

Raub, Herman.—Pres. Empire State Motor Car Co., 2148 Broadway, New York City.

Rauch & Lang Carriage Co., The.—W. 25th St., Cleveland, O. Makers of the Rauch & Lang electric car; first marketed in 1904. Seven models made since. Cap. \$250,000. Chas. Rauch, Pres.; Chas. L. F. Wieber, Vice-Pres.; Chas. E. J. Lang, Sec., Treas., Gen. Mgr. and Purch. Agt.; H. N. Ravinscroft, Sales and Advt. Mgr. Agents and dealers: Colburn Auto Co., Denver, Colo.; Kimball & Co., C. P., Chicago, Ill.; McNall, Arthur, Rochester, N. Y.; Murphy, Alfred H., Erie, Pa.; Ramaley, F. W., St. Paul, Minn.; Rice's Garage, Baltimore, Md.; Teegarden & Pull, Goshen, Ind.; Union Electric Light & Power Co., St. Louis, Mo.; Wellman, J. A., Manchester, N. H.; Wm. F. V. Neumann & Co., Detroit, Mich.

Rauch, Chas.—Pres. The Rauch & Lang Carriage Co., W. 25th St., Cleveland, O.

Rauh, Isidor.—Gen. Mgr. The Cincinnati Electric Tool Co., 650-652 Evans St., Cincinnati, O.

Ravel et Homeyer.—114 rue d'Annoy, St. Etienne, France. Mfrs. steering and transmission gears.

Ravenscroft, H. N.—Sales Mgr. The Rauch & Lang Carriage Co., W. 25th St., Cleveland, O.

Raves, Ewald.—Gen. Supt. Willyoung Appliance Co., Ludlow Station, Yonkers, N. Y.

Raw-hide.—Leather which has not been tanned. It is used for making driving belts, noiseless gears, etc.

Rawle, H.—Director and Asst. Gen. Mgr. Dragon Motor Co., 31st, 32nd and Chestnut Sts., Philadelphia, Pa.

Ray, D. A.—Fosston, Minn. (Buick.)

Ray, Fred.—Pres. Smith-Haines, 1673 Broadway, New York City.

Ray-Wortham Automobile Co.—609 Throckmorton St., Ft. Worth, Tex. (Stoddard-Dayton.)

Rayfield & Rayfield.—6523 Wentworth Ave., Chicago, Ill. Repairing.

Raymond Mfg. Co.—Corry, Pa. Mfrs. machinery springs.

Razoux, Chas. L.—446 Tremont St., Boston, Mass. Mfrs. motorcycles.

Rea Bros. & Co.—202 Nicollet Ave., Minneapolis, Minn. Mfrs. tire cement.

Reach.—One of the two longitudinal members of a motor-vehicle frame. See Side-member, Sill, and Girder.

Reach-spring.—See Spring, Reach.

Reactance.—That part of the impedance of a circuit which is due to its self-induction and capacity.

Reaction.—In mechanics, a general term for a force which is acting in opposition to another force or system of forces.

Read Bicycle Co.—Ave. D., bet. 12th and 13th Sts., Miami, Fla. (Indian.)

Read, F. B.—Head of Automobile Top Dept., Springfield Metal Body Co., Birney Ave., Springfield, Mass.

Read Corporation, Fred.—Newtonville, Mass. Garage.

Read Underhill Co.—222 Columbus Ave., Boston, Mass. (Knox.)

Read, W. K.—Texarkana, Ark. Garage.

Reading Auto Garage.—Reading, Mass. (Maxwell.)

Reading Automobile Co.—26 S. Fifth St., Reading, Pa. (Peerless, Franklin, Buick, Oldsmobile, Pope-Waverley.) Est. 1899. Cap. \$20,000. James Rick, Pres.; Hunter Eckert, Vice-Pres.; H. O. Koller, Sec., Treas. and Gen. Mgr. Garage, 40 cars. Repairing.

Reading Iron Co.—Reading, Pa. Mfrs. wrought iron and steel pipe.

Reading Metal Body Co.—Reading and Fleetwood, Pa. Mfrs. bodies. Cap. \$25,000. Est. 1905. James C. Reber, Pres.; Harry C. Uric, Treas.; Geo. B. Schaeffer, Sec.

Reading Standard Cycle Mfg. Co.—Reading, Pa. Mfrs. motorcycles. (R. S.)

Reagans, John T.—S. Baptist St., Newport, R. I. Garage.

Real Aero Club de Espana (Spanish Aero Club).—Alcala 70, Madrid, Spain (Member F. A. I.)

Ream Bros., Automobile Agency.—606-8 Broadway, Greenville, O. (Knox, Waltham, White, Packard, Buick, Cadillac, Franklin.)

Reamer.—A tool with longitudinal cutting ridges for enlarging or truing a hole already formed.

Reason & Son, Geo. W.—Pinckney, Mich. (Maxwell, Reo, Cartecar.)

Reason Automatic Air Pump Co.—Pontiac, Mich. Mfrs. air pumps.

Rebate.—A synonym for rabbet, q. v.

Reber, C. D.—Allentown, Pa. (Atlas.)

Reber, James C.—Pres. Reading Metal Body Co., Reading and Fleetwood, Pa.

Reber, J. D.—Vice-Pres. and Sec. Ber-

win Automobile Co., 128-132 N. 8th St., Allentown, Pa.

Rébour, J.—3, rue ampere, Puteaux, France. Mfrs. gasoline commercial automobiles (Rébour), and automobile motors.

Recalescence.—If a piece of iron wire which has been raised to a red heat be allowed to cool in a dark room, it loses its glaring appearance as it cools, and then suddenly glows out again, after its temperature has fallen to a certain value. This phenomenon is termed "recalescence," and the temperature at which it occurs the "temperature of recalescence."

Rech & Sons, Jacob.—8th St. and Girard Aves., Philadelphia, Pa. Mfrs. wood and metal bodies.

Reciprocating.—A term applied to a mechanism of which the parts move backward and forward alternately, as in the case of ordinary steam-engines and pumps.

Reciprocating Pump.—See Pump, Reciprocating.

Reckitt, C. C.—Pres. The Turner Brass Works, Sycamore and Illinois Sts., Chicago, Ill.

Record Motor Co.—585 Stoneystanton Road, Coventry, England. Mfrs. automobile motors.

Rectifier.—An apparatus for converting an alternating current into a direct or continuous one, and permit of its use in recharging storage-batteries. A rectifier may be (1) a mechanical device in the nature of a "commutator" (q. v.); a "rotary converter" (q. v.); (3) a "chemical" or "electrolytic rectifier," in which a pair of aluminum plates, for example, dipping into a suitable solution (say ammonium phosphate) are connected to the alternating current supply, whereupon the current will be found to pass through the cell in one direction only; or (4), a "mercury arc rectifier," consisting of an exhausted bulb containing two graphite electrodes (anodes) and two electrodes (cathodes).

The upper (graphite) electrodes are provided with leads and terminals, and each lower (mercury) electrode is covered with a metal cap to which a lead is attached. The two upper electrodes are called the positive electrodes and the central lower one is called the negative electrode; while the other lower one is an auxiliary used only for starting the

rectifier into operation. The bulb is mounted in such a manner that it can be oscillated on starting so that the mercury of the negative electrode and that of the auxiliary electrode come into contact for a mo-



ment, when the current passes and some of the mercury is volatilized. As the positive electrodes will pass current only in one direction when once started, and oppose all current-flow in the opposite direction, the current flows through the two positive electrodes alternately and through the mercury vapor to the negative electrode always in the same direction. In this way a true continuous current is produced with small pulsations and with very small loss in transformation. The accompanying figure illustrates a Cooper-Hewitt mercury arc rectifier.

Red Devil Racing Association.—Edward Edwards, Sec. St. Louis, Mo.

Reddew, G. H.—Mgr. and Vice-Pres. Helios Mfg. Co., Bridesburg, Philadelphia, Pa.

Reddew, G. W.—Head of Sales Dept. Helios Mfg. Co., Bridesburg, Philadelphia, Pa.

Redford, O. P.—Sec. and Gen. Supt. Richmond Forgings Corporation. Belle Isle, Richmond, Va.

Red Heat.—The temperature at which a body emits a red glow.

Read Lead.—See Lead, Red.

Red Short.—A term applied to iron or steel which cannot be readily forged or rolled at or above red heat.

Red Wing Boat Mfg. Co.—Red Wing, Minn. Mfrs. gasoline marine motors and motor boats.

Redington & Co., F. B.—107-109 S. Sangamon St., Chicago, Ill. Mfrs. transmission gears, lubricators.

Redlands Auto Co.—9-11 W. Citrus Ave., Redlands, Cal. Garage.

Redman, H. E.—Vice-Pres. Mitchell Motor Car Co., Racine, Wis.

Redmond, A. J.—Council, Austin Automobile Club, Austin, Ill.

Redmond, Andrew.—N. 3rd and Boyd Sts., Harrisburg, Pa. (Columbus.)

Redon, E.—Cazoules, Dordogne, France. Mfrs. primary batteries.

Reducer.—A coupling for connecting pipes of different diameters; called also a "reducing pipe," "reducing joint," or "reducing socket."

Reducing-joint.—See Reducer.

Reducing-valve.—See Valve, Reducing.

Reed.—A thin elastic plate of metal fastened by one end over an opening in the base of a horn or other wind-instrument and serving to produce a musical note through its vibration as the air is forced past it. See Horn.

Reed & Co., S. L.—25 Westfield Ave., Elizabeth, N.J. Garage.

Reed & Johnson.—109 W. Chicago St., Concord, Mich. (Reo.)

Reed, A. B.—Treas. and Gen. Mgr. Belden Machine Co., Whalby Ave. and Tryon St., New Haven, Conn.

Reed Bros.—715 19th St., N. W. Washington, D. C. Garage.

Reed Co., Francis.—43 Hammond St., Worcester, Mass. Mfrs. special automobile machinery.

Reed Mfg. Co.—Kalamazoo, Mich. Mfrs. steel castings.

Reed Underhill Co.—222 Columbus Ave., Boston, Mass. (Knox.)

Reeding.—The same as milling or knurling, q. v.

Reese, E. Shriver.—230 Euclid Ave., Cleveland, O. (Columbus, Royal)

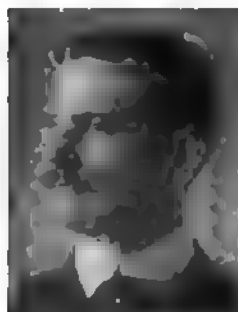
Reese Machinery & Tool Works, S.—Plymouth, Pa. (Lambert.)

Rees, F. H.—Steel Memorial Bldg., Elmira, N. Y. Mfr. license numbers, monograms and name plates.

Rees, H. O.—242 W. Commerce St., San Antonio, Tex. (Lambert.)

Reeve.—To pass a line through a block or ring. See Pulley.

Reeves, Alfred Pierrepont.—Gen. Mgr. American Motor Car Manufacturers' Association.



Born Brooklyn, N. Y., Sept. 16, 1875. Ed. Brooklyn High School. Mem. N. Y. Motor Club. Res. 201 W. 132d St. Office, 29 W. 42d St., New York City. In trade since 1899. Early writer on automobile topics in Evening Mail.

N. Y. American, N. Y. Globe. Mgr. race meets Empire track, Brighton Beach, Morris Park. Recreations, automobiling and motor boating

Reeves & Son, Paul S.—1415 Catherine St., Philadelphia, Pa. Mfrs. brass, bronze, aluminum and copper castings, babbitt and bronze metals

Reeves Auto Station.—7th and Market Sts., Camden, N. J. Garage

Reeves, Burton.—Freeport, Ill. (Jewel.)

Reeves, G. L.—Sec. and Treas. Reeves Pulley Co., 1225 Seventh St., Columbus, Ind.

Reeves, H. W.—Treas. Milne Auto-Start Co., 919 W. Fort St., Detroit, Mich.

Reeves, M. O.—1st Vice-Pres. Reeves Pulley Co., 1225 Seventh St., Columbus, Ind.

Reeves, M. T.—Pres. Reeves Pulley Co., 1225 Seventh St., Columbus, Ind.

Reeves Pulley Co.—1225 Seventh St., Columbus, Ind. Mfrs. automobile engines, clutches, and complete power equipments for motor buggys. Cap. \$90,000. Est. 1888. M. T. Reeves, Pres.; M. O. Reeves, 1st Vice-Pres.; D. T. McNiel, 2nd Vice-Pres.; G. L. Reeves, Sec. and Treas. Mem. M. & A. M.

Refined Iron.—See Iron, Refined.

Reflector.—A concave mirror used in a lamp for reflecting the light of the latter in a desired direction.

Reflector, Parabolic.—A reflector of parabolic cross-section for projecting the light from a lamp in a straight, powerful beam.

Refractory.—A term applied to infusible substances, such as fine clay, lime, etc., which are used as crucibles and furnace linings.

Regal Gasolene Engine Co.—Coldwater, Mich. Mfrs. gasolene marine motors.

Regatta.—A sailing match between boats.

Regent Garage.—4618 Regent St., Philadelphia, Pa. Garage.

Register's Sons & Co., J.—Holliday and Saratoga Sts., Baltimore, Md. Mfrs. special brass work.

Register.—A mark made upon a piece of mechanism in order to show its exact position with respect to other parts. Before disassembling the pieces forming parts of a mechanism they should be "registered" (if they have not been by the manufacturer) by cutting letters, numbers or other figures on the corresponding parts by means of a punch or other tool.

Regulator.—In steam-cars, the lever that controls the quantity of steam admitted to the cylinder, and thus regulates the speed of the car. It is sometimes called the "throttle." (2) A term sometimes used for the accelerator on gasolene cars.

Regulator, Air.—See Air-regulator.

Regulator-pedal.—See Pedal. Regulator.

Regulator, Pressure.—See Pressure-regulator.

Regulator-valve.—The same as throttle-valve. See Valve, Throttle.

Reheating.—The process of heating steel ingots in a furnace before rolling.

Reich, Robert A.—Broadway, Kansas City, Mo. (Merkel.)

Reichenbach, Karl-Wilhelm.—Elsterwerde-Biehla, Saxony, Germany. Mfr. motorcycles.

Reichert Automobile Co.—34-44 Temple St., New Haven, Conn. (Haynes, Waltham.) Supplies; garage; repairing.

Reid, F. A.—Mgr. Name Plate Dept., The Turner Brass Works, Sycamore and Illinois Sts., Chicago, Ill.

Reid, R. T.—Midland, Tex. (Mitchell.)

Reid, S. D.—Euclid Garage, Cleveland, O. (Dolson.)

Reid, W. J.—52 S. La Salle St., Aurora, Ill. Garage.

Reid, Wm.—Supt. Pierce Engine Co., 2200 Clark St., Racine, Wis.

Reidenbach, R. P.—Ashtabula, O. (Jackson.)

Reiff, Frank H.—16 N. Beaver St., York, Pa. Garage.

Reighard, D. P.—Ellsworth and College Aves., Pittsburg, Pa. Garage.

Reilly & Son Co., P.—Passaic Ave., Newark, N. J. Mfrs. leather.

Reilly, C. J.—Syracuse, Ind. (Waltham.)

Reilly, S. C.—Supt. The M. Seward & Son Co., New Haven, Conn.

Reinfried, C. J.—Manitowac, Wis. (Cameron.)

Reinhold Giese.—113 Ritterstrasse, Berlin, S., Germany. Mfrs. radiators.

Rejna, Zanardini e Co.—39 Bastioni Magenta, Milan, Italy. Mfrs. acetylene lamps.

Relay Motor Car Co.—1712 N. 10th St., Reading, Pa. (Relay.)

Release.—The opening of the exhaust-port of an engine cylinder to permit the escape of the steam or gas at the end of the stroke.

Reliable Automobile Co.—1000 Bolivar Rd., Cleveland, O. Garage.

Reliable Automobile Co.—7th and Pacific Aves., Tacoma, Wash. W. O. Williams, Mgr. (Baker, Buick, Oldsmobile, Pope-Hartford, Pope-Toledo, Thomas.) Garage.

Reliable Auto Station.—49 E. Utica St., Buffalo, N. Y. Garage.

Reliable Dayton Motor Car Co.—375 W. Lake St., Chicago, Ill. Mfrs. gasoline automobiles.

Reliable Repair Co.—1607 Michigan Ave., Chicago, Ill. Garage.

Reliable Water Gauge Co.—1616 Pine St., St. Louis, Mo. Mfrs. water gauges and columns. Est. 1900.

Reliance Automobile Co.—547-557 Fulton St., San Francisco, Cal. Est. April 1, 1906. Cap. \$25,000. Samuel M. Crim, Pres.; Geo. E. Erlin, Vice-Pres.; C. S. Richardson, Sec. and Mgr.; John Frolicher, Supt. Garage, 50 cars; repairing.

Reliance Electrical Works.—Astoria, Ore. (Waltham.)

Reliance Gauge Column Co., The.—45 E. Prospect St., Cleveland, O. Mfrs. water alarms and columns.

Reliance Machine Co.—40 S. Park Ave., Warren, O. (Maxwell, R. S. motorcycles.)

Reliance Motor Car Co.—89 Fort St. E., Detroit, Mich. Makers of the Reliance truck; first marketed in 1906. One model. Cap. \$400,000. Fred O. Paige, Pres.; J. B. Corliss, Sec.; E. W. Gans, Treas. and Gen. Mgr.; J. M. Mulkey, Vice-Pres.; Howard A. Wilcox, Designer and Supt.; W. K. Ackennan, Purch. Agt.; F. L. Loomis, Sales and Advt. Mgr.

Reliance Motor Car Co.—216 E. 3d St., Cincinnati, O. (Maxwell.)

Reliance Motor Cycle Co.—Addison, N. Y. Mfrs. motorcycles.

Reliance Oil & Grease Co., The.—1501-1502 Columbus Rd., Cleveland, O. Mfrs. lubricants, grease and oils. Est. 1888. J. M. Bachert, Mgr.

Relief-cock.—See Cock, Relief.

Relief-valve.—See Valve, Relief.

Reluctance.—"Reluctance" is the magnetic resistance opposed to the passage of the flux of force in a magnetic circuit. By the analogy to electric resistance the magnetic resistance is directly proportional to the length of the circuit, and to the reluctivity which depends on the nature of the material and is inversely proportional to the section.

Remanence.—The small quantity of magnetism that remains in a soft iron inductor after a dynamo has stopped and the exciting current has ceased.

Remkin, G. S.—Chief Accountant, Willard Storage Battery Co., 1279-81 Bank St., Cleveland, O.

Remppis, W. F.—Treas. Reading Standard Co., Water St., Reading, Pa.

Remsen Mfg. Co., I. S.—754 Bedford Ave., Brooklyn, N. Y. (Locomotive.)

Remy, B. P.—Pres. Remy Electric Co., Anderson, Ind.

Remy Electric Co.—Anderson, Ind. Mfrs. magnetos for all kinds of explosive engines, spark coils and ignition cables. B. P. Remy, Pres.; Frank Remy, Sec. and Treas. Mem. M. & A. M.

Remy, Frank.—Sec. and Treas. Remy Electric Co., Anderson, Ind.

Renard, Colonel Charles.—Born at Dambloin (Vosges), Nov. 23, 1847; died at Chalais-Meudon, April 13, 1905. After graduating from the Polytechnique he engaged in engineering, and in 1877 became head of the Chalais-Meudon establishment, and there began the work in military ballooning which made him famous. It is to him and his collaborator, Lieutenant, afterward Commander Krebs, that is due the honor of having demonstrated the possibility of steering balloons. His dirigible balloon "La France," actuated by an electric motor, returned, during the course of some brilliant experiments in 1884-85, five times out of seven to its starting-point, after trips of which the longest was nine and a half miles.

Renard, Commander Paul.—1 Avenue de l'Observatoire, Paris. After graduating from the Polytechnique, he engaged in engineering, became a collaborator of his brother, Colonel Charles Renard, and took an important part in the creation of and experiments with the famous dirigible balloon, "La France." He has published numerous memoirs, and among them, an important one on the "Conditions of Safety of Motor-Aerostats," and a learned study on "Races and Record Tests of Motor-Aerostats."

Renard Société Française des Trains.—

11 Rue Lafayette, Paris, France. Mfrs. gasoline commercial automobiles. (Renard.)

Renaudin, H.—36 Rue Urbain IV., Troyes, Aube, France. Mgr. non-skids.

Renault, Fernand.—7 Rue de Pen-
thierre, Paris. Born at Paris. Nov. 28,
1864. Co-partner in the Renault Frères



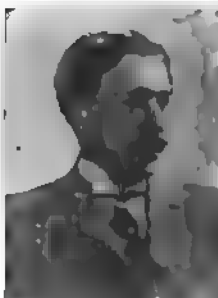
automobile works. Vice-President of the Automobile Section of the Syndical Chamber of the A. C. F.

Renault Frères.—139 Rue du Point du Jour, Billancourt, Seine, France. Mfrs. automatic starters, gasoline commercial automobiles (Renault delivery

wagons), and gasoline automobiles (Renault.)

Renault Frères Selling Branch.—Broadway and 57th St., New York City. (Renault.) Est. 1906. Paul Lacroix, Gen. Mgr. Repairing.

Renault, Louis.—4 Rue Puvis de Cha-



vannes, Paris. B. at Paris, Feb. 12, 1877. Chevalier of the Legion of Honor, officer of the Mérite Agricole. Chevalier of the Order Francis Joseph, partner in the Renault Frères automobile wks. Member of the Committee of the

A. C. F. and of the Sporting Committee. He is one of the best known figures in the automobile world.

Renault, Marcel.—Born in 1872. One



of the founders of the Renault Frères automobile works. Took part in the first voiturette races (Paris-Trouville Paris-Ostende, and Paris-Rambouillet), in which, with his brother Louis, he won first places. In the Paris-Madrid race he acci-

dentally fell and died two days afterward.

Rendon y Hermano, J.—Calle 63, No. 501, Merida, Yucatan, Mexico. (Franklin, Monarch, Cameron.)

Renfrew, S. S.—Harvey, N. D. (Buick.)

Renfro's Garage & Supply House.—Tonopah, Nev. (American.)

Reno Garage.—Cor. Lake and 2d Sts., Reno, Nev. (Pope-Toledo, Franklin.)

Renson, F. G.—Gen. Mgr. Koehler Sporting Goods Co., 845 Broad St., Newark, N. J.

Renat & Renst.—Junction City, Kan. (Ford.)

Renstrom Co., Frank O.—424-26 Stanyan St., San Francisco, Cal. (Pullman.) Est. March 1, 1905. Inc. Dec. 20, 1906. Cap. \$160,000. Frank O. Renstrom, Pres., Treas. and Gen. Mgr.; Gus L. Renstrom, Vice-Pres.; Geo. R. Kibbe, Sec. Garage, 40 cars. Repairing. Branch at Oakland, 40 cars. Repairing. Supplies. Branch at Oakland, Cal.

Renstrom, Frank O.—Pres., Treas. and Gen. Mgr. Frank O. Renstrom Co., 424-46 Stanyan St., San Francisco, Cal., and Oakland, Cal.

Renstrom, Gus L.—Vice-Pres. Frank O. Renstrom Co., 424-46 Stanyan St., San Francisco, Cal., and Oakland, Cal.

Renton & Williams Motor Car.—1032 S. Main St., Los Angeles, Cal. (Atlas, Smith)

Reo Auto Co.—1634 Broadway, Denver, Colo. (Reo, Gale, Premier.)

Reo Automobile Co.—Main St., Wolcott, N. Y. (Reo, Premier)

Reo Automobile Co.—283 Halsey St., Newark, N. J. Garage.

Reo Motor Agency.—100 York Sq., New Haven, Conn. (Reo.)

Reo Motor Car Co.—Lansing, Mich. Makers of the Reo car. Cap. \$1,000,000. R. E. Olds, Pres.; Reuben Shettler, Vice-Pres.; E. F. Peer, Sec and Treas.; R. H. Scott, Gen. Mgr.; H. T. Thomas, Designer; J. P. Fillinghane, Supt.; George E. Smith, Purch. Agt.; R. M. Owen, Sales Mgr.

Reo Motor Car Co.—1032 Euclid Ave., Cleveland, O. (Reo, Premier.)

Reo Motor Car Co.—289 Jefferson Ave., Detroit, Mich. (Reo)

Reo Motor Car Co. of Philadelphia.—242 N. Broad St., Philadelphia, Pa. (Reo, Premier.) Est. 1906. Repairing.

Reo Motors, Ltd.—Little George St., London, England. (Reo.)

Reopell, A. V.—Mgr. The Woodward Reopell Co., 18-20 Fort St., Springfield, Mass.

Republic Belting & Supply Co.—1616 W. 3d St., Cleveland, O. Mfrs. clutch and break band leathers, V-shaped and flat fan belts, tool kits. Cap. \$300,000. Est. 1888. E. C. McKay, Pres.; S. C. Cutler, Vice-Pres.; S. H. Moore, Sec. and Treas.; F. J. Man, Mgr. Automobile Accessories Dept.; E. P. Thomas, Mgr.

Belting Dept., and S. C. Cutler, Mgr. Machinery Dept.

Republic Iron & Steel Co.—Stock Exchange Bldg., Chicago, Ill. Mfrs. bolts and nuts, angle, channel and tee iron and steel, bar iron and steel.

Republic Rubber Co., The.—Youngstown, O. Mfrs. tire cement, removable rims, pneumatic tires, solid tires. Branches: 47 Warren St., New York City; 116 Lake St., Chicago, Ill.; 1215 N. Broadway, St. Louis, Mo.; 106 Market St., Pittsburg, Pa.; 103 Beale St., San Francisco, Cal.; 1616 W. 3d St., Cleveland, O.; 139 Congress St., Boston, Mass.; 1562 14th St., Denver, Colo.; 237 Jefferson Ave., Detroit, Mich.

Republic Rubber Tire & Shoe Co., The.—449 W. 53d St., New York City. Mfrs. anti-skid devices and tire treads.

Resilience.—The quantity of work given back by a body that is compressed to a certain limit and then allowed freely to recover itself. The act or power of springing back to a former position; elasticity.

Resiliometer.—A device invented by Mr. C. E. Duryea and employed for testing the comparative resilience of different tires.

Resin.—A dark-brown transparent gum obtained from pine trees. It is used as a flux for soldering, and is sometimes employed on leather faced clutches to increase their adhesion.

Resistance Coil.—See Coil, Resistance.

Resistance, Electric.—The opposition offered to the molecules of a body to the passage through them of an electric current. It varies with the nature, the size, and the length of the wire connecting the two terminals. The resistance is measured in "ohms."

Restelli.—15a via Disciplini, Milan, Italy. Mfrs. motorcycles.

Restivity.—"Restivity," or specific resistance, is a property inherent to the matter constituting the bodies that are conductors of electricity. It depends upon the chemical composition of the body, upon its physical state, and upon its temperature, pressure, etc. It is a factor, the value of which is obtained by multiplying the electric resistance of the conducting body by its straight section, and dividing the product thus obtained by the length of the conductor.

Retainer.—A device in a ball or roller bearing for holding the balls or rollers in place.

Retardation.—The checking or decrease of any movement. See Acceleration.

Rettig, F. J.—Canal St., Wabash, Ind. (Lambert, Ford.)

Return Elbow.—See Elbow.

Revere Drop Forge Co.—Revere, Mass. Mfrs. drop forgings.

Reversible Steering.—See Steering, Reversible.

Reversing Cam.—See Cam, Reversing.

Reversing-engine.—An engine that can be reversed, usually by link-motion, q. v. Gas engines and steam turbines cannot, as a rule, be reversed by any form of valve or other gear.

Reversing-gear.—See Gear, Reversing.

Reversing-lever.—See Lever, Reversing.

Reversing-link.—See Link, Reversing.

Reversing-shaft.—See Shaft, Reversing.

Revillon Frères.—79 Rue de Rivoli, Paris, France. Mfrs. wearing apparel; coats.

Revillon Frères, Inc.—19 W. 34th St., New York City. Mfrs. caps, gloves, gauntlets and miscellaneous wearing apparel.

Revolution.—Motion of a body in a circular path entirely around a center on which it does not necessarily rotate.

Revolutions Counter.—A small apparatus which is placed at the end of a shaft in motion, or in proximity to a part of a machine in motion, in order to measure the number of revolutions made in a certain time. The mechanism of such apparatus varies to infinity.

Revue Commercial Automobile.—Pub. at 16 Rue d'Argenteuil, Paris, France.

Revue de L'Association Générale Automobile.—Pub. at 8 Place de la Concorde, Paris, France.

Revue de Mécanique.—Pub. at Paris, France.

Revue des Publications Automobiles.—Pub. at 27 Rue Ballu, Paris, France.

Revue des Transports Automobiles.—Pub. at 29 quai des Grand-Augustins, Paris, France.

Revue du Touring Club de France.—Pub. at 65 ave. de la Grande Armée, Paris, France.

Revue du Tourisme et des Sports.—Pub. at 20 rue de la Pompe, Paris, France.

Revue Française de Constructions Automobiles.—Pub. at 34 rue de Charonne, Paris, France.

Rex Fire Extinguisher Co.—74 Cortland St., New York City. Mfrs. fire extinguishers.

Rex Imperial Leather Co.—16 Chappel St., Newark, N. J. Mfrs. leather.

Rex Motor Co.—69 Woodward Ave., Detroit, Mich. Mfrs. gasoline marine motors, spark plugs.

Rex Motor Mfg. Co., Ltd.—Coventry, England. Mfrs. Rexette and Littette tricycles and Rex motorcycles.

Rexfords, D. C.—Vice-Pres. Pungs-Finch Automobile & Gas Engine Co., 1524 Jefferson Ave., Detroit, Mich.

Reyburn Motor Car Co.—4601 Olive St., St. Louis, Mo. (Royal, Stearns.)

Reynolds & Archer.—169th St. and Jerome Ave., New York City. Garage.

Reynolds, H. F.—Sec. Coppock Motor Car Co., Decatur, Ind.

Reynolds, Isaac.—Sec., Treas. and Mgr. The F. A. Neider Co., Inc., Augusta, Ky.

Reynolds Motor Works.—3149 Wabash Ave., Chicago, Ill. Garage.

Reynolds, Walter J.—Pres., Treas., Gen. Mgr. and Sales Mgr. Racine Boat Mfg. Co., Riverside, Muskegon, Mich.

Reynolds, Wilbur F.—Partner Rittenhouse Garage, 214-220 S. 23d St., Philadelphia, Pa.

Rheometer.—An apparatus for measuring electric currents.

Rheophores.—The conducting wires attached to each terminal of a battery.

Rheostat.—An apparatus designed to increase or diminish the resistance of an electric circuit, and consisting of a number of coils of wire, which are successively connected into the circuit by the progressive movements of a switch. In certain cases use is made of liquid rheostats, in which the resistance is regulated by the immersion of a metal or carbon plate to a greater or less depth in a conducting bath of a metallic salt.

Rhode, Claire.—Pine Village, Ind. (Haynes.)

Rhode Island Automobile Club.—Providence, R. I. William Penn Mather, Pres.; Charles O. Reade, Vice-Pres.; Charles A. Russell, Treas.; Frank M. Barber, 16 Garnet St., Providence, R. I., Sec.

Rhode Island Machine Co., The.—Providence, R. I. Mfrs. machine work to order.

Rhode Island Malleable Iron Works.—Hills Grove, R. I. Mfrs. malleable iron castings.

Rhode Island Motor Car Co.—69 Broad St., Providence, R. I. (Pope-Hartford, Franklin.)

Rhode Island Second-hand Automobile Reg.—7 Dorrance St., Providence, R. I. Garage.

Rhodes, A.—Cooperstown, Griggs Co., N. D. (Mitchell.)

Rhodes, Benj.—Asst. Supt. Dayton Motor Car Co., Dayton, O.

Rhodes, H. C.—E. Main St., Bay Shore, L. I., N. Y. Garage; supplies.

Rhodes, John F.—109 Church St., Elmira, N. Y. (Waltham, Jackson.)

Rhodes, Lewis F.—Phoenixville, Pa. (Simplicity.)

Rhodes Mfg. Co.—Grand Rapids, Mich. Mfrs. tire tools.

Rialto Automobile Co.—Fresno, Cal. (Winton.)

Rialto Automobile Exchange.—307 W. 44th St., New York City. Garage.

Rib.—A piece of timber that forms one of the sides of a boat. (2) Of a shaft, a longitudinal piece screwed to the periphery; called also a "feather." (3) A

heat radiating device, called also a "gill," "fin," or "flange."

Ribband.—A temporary lengthwise strip following a vessel's curves and bolted to its ribs in order to hold them in place until the planking is secured to them.

Ribbon-brake.—See Brake, Band.

Ribetti e Colonbatto.—Via Bava, Turin, Italy. Mfrs. automobile motors.

Rice & Co., John V., Jr.—Bordentown, N. J. Mfrs. gasoline marine motors.

Rice, Chas.—Waverley, Kan. Garage.

Rice, C. B.—941 8th Ave., Cleveland, O. Garage.

Rice, Herbert H.—Mgr. Pope Motor Car Co., 139 S. East St., Indianapolis, Ind.

Rice, J. J.—Kramer, Ind. (Rambler.)

Rice, Louis E.—Cedar Rapids, Ia. Garage.

Rice, L. H.—Sec., Treas. and Gen. Mgr. The Spalding Engine Co., St. Joseph, Mich.

Rice, M. A.—Baltimore, Md. (Rauch & Lang.)

Rice, P. H., Jr.—Demonstration Dept. National Automobile Co., 957 Main St., Los Angeles, Cal.

Rich, H. M.—Morrisville, Vt. (Pope, Toledo, Pope-Hartford, Pope-Waverley, Cadillac, Jackson.) Est. 1905.

Richard, G.—108 rue St. Maur, Paris, France. Mfr. automobile motors.

Richard, Georges, Société des Automobiles.—1 quai National, Puteaux, Paris, France. Mfrs. gasoline automobiles. (Unic.)

Richard, J. E.—Sec. and Mgr. Charleston Motor Car Co., 161 Meeting St., Charleston, S. C.

Richards & Co., Jos.—Spring Hill, Birmingham, England. Mfrs. springs.

Richards & Simonds.—Main and Elm Sts., Southbridge, Mass. Garage.

Richards Auto Garage.—321 E. State St., Trenton, N. J. (Franklin, Pope-Hartford, Pope-Toledo.)

Richards, J. B.—Second St., Ashland, O. (Ford, Jackson.)

Richards, J. L.—Oakwood Rd., Newton, Mass. Garage.

Richards, J. T.—Vice-Pres. National Casket Co., Chicago, Ill.

Richards, W. E.—Weatherford, Tex. (Cadillac.)

Richardson, C. S.—Sec. and Mgr. Reliance Automobile Co., 547-57 Fulton St., San Francisco, Cal.

Richardson Electric Co.—210 W. 1st St., Duluth, Minn. (Pope-Waverley, Buick, Cadillac, Maxwell, Reo, White.)

Richardson Engineering Co.—Hartford, Conn. Mfrs. charging apparatus, electric motors and spark plugs.

Richardson, Geo. H.—Treas. Kilgore Mfg. Co., 101 Main St., Old Town, Me.

Richardson, J. M.—Pres. Citizens' Mo-

tor Car Co., N. E. cor. 7th and Main Sts., Cincinnati, O.

Richardson, J. R.—11th and West Sts., Wilmington, Del. (Rapid.)

Richardson, Lee.—Redlands, Cal. (Earl)

Richardson Lubricating Co.—Quincy, Ill. Mfrs. oils.

Richardson, M. T.—Pres. and Treas. The Motor Vehicle Pub Co., 24 Murray St., New York City.

Richardson Paper Co.—Lockland, O. (American Mercedes.)

Richardson, R. C.—Asst. Mgr. The E. J. Kehoe Co., Inc., 1659 Broadway, New York City.

Richardson, W. G.—Pres. Lane Sales Co., 514 W. 145th St., New York City. Gen. Sales Agt. for the Lane Motor Vehicle Co., Poughkeepsie, N. Y.

Richford & Co.—52a High Holborn, London, England. Mfrs. storage batteries.

Richley, J. W.—29 S. Beaver St., York, Pa. (Cadillac, Franklin, Winton.)

Richmond Auto & Storage Co.—27 Chenango St., Buffalo, N. Y. Garage.

Richmond County Automobile Club.—New Brighton, S. I., N. Y. J. J. Worrell, Sec.

Richmond Forgings Corp.—Belle Isle, Richmond, Va. Mfrs. drop forgings, crank shafts, connecting rods, hubs and steering knuckles. Cap. \$200,000. Est. Sept., 1905. Jonathan Bryan, Pres.; W. R. Williams, Vice-Pres. and Treas.; O. P. Redford, Sec. and Gen. Supt.; E. D. Whitmayer, Supt.; D. B. Jacobs, Foreman Hammer Dept

Richmond-Jarvis Co.—13 Park St., Grand Rapids, Mich. (Jewel, Rambler, National.)

Richmond, J. A.—Sec. and Treas. Willard Storage Battery Co., 1279-81 Bank St., Cleveland, O.

Richmond, J. R. H.—Pres. National Battery Co., Buffalo, N. Y.

Richter Bros.—2406 Grand Ave., Kansas City, Mo. Repairing. (Moon.)

Richter, Robt. H.—1421 Michigan Ave., Chicago, Ill. (Hotchkiss.)

Richwine, W. A.—Mgr. Hiland Automobile Co., 5811-17 Center Ave., Pittsburgh, Pa.

Rick, James.—Pres. Reading Automobile Co., 26 S. 5th St., Reading, Pa.

Rickey Machine Co.—92 Eaton Pl., E. Orange, N. J. (Marmon.)

Riddell Automobile Co.—720 Locust St., Des Moines, Ia. (Buick, Cadillac, Franklin, Winton.)

Ridgely, William Barrett.—Pres. Witherbee Igniter Co., 541 W. 43d St., New York City.

Ridgway Automobile Co.—Ridgway, Pa. Garage.

Riding.—A driving-chain is said to "ride" when it mounts on the teeth of the

sprocket and rests upon them, and two gear-wheels are said to ride when they become displaced so that the tips of the teeth come into contact.

Riding, Driving & Automobile Club.—Montclair, N. J.

Riding & Driving Club.—Baltimore, Md.

Riding & Driving Club.—Prospect Park Plaza, Brooklyn, N. Y. Garage.

Rieman, Herman.—Chemnitz-Gablenz, Germany. Mfrs. acetylene and oil lamps.

Riesner, Josef.—VI. Schmalzhofg. Vienna, Austria. Mfr. motorcycles.

Rietveld, H.—Pella, Ia. (Waltham.)

Riffier.—A file of which the axis or center line is curved.

Rigaud, A.—251 rue du Faubourg de Roubaix, Lille, France. Mfr. automobile motors.

Riggs, J. Dudley.—1118 Cathedral St., Baltimore, Md. (Simplex.)

Riggs Land Co.—Redfield, S. D. (Lambert.)

Riggs, T. D.—10 Clinton St., Hartford, Conn. (Isotta, Simplex.)

Right-hand Screw.—See Screw.

R'jwielenfabriek Gruno.—Winschoten Holland. Mfrs. motorcycles. (Gruno.)

Riker, Andrew Lawrence.—Vice Pres. and Chief Engr. The Locomobile Co. of America. B. New York City, Oct. 22, 1868. Ed. private



schools, Columbia College Law School. Director Locomobile Co. of America, Mem. A. C. A., N. Y. Motor. A. C. of Bridgeport, Republican, Engineers', Transportation, Baltusrol Golf. Res. 1416 Fairfield Ave., Bridgeport, Conn.

Office, Locomobile Co. of America. Bridgeport, Conn. In the trade since 1896. Built self-propelled vehicle in 1884. Recreations, automobiling, yachting.

Riley & Son, Wm. B.—324-326 Market St., Philadelphia, Pa. Mfrs. automobile robes.

Riley Cycle Co., Ltd.—City Works, Coventry, England. Mfrs. tricar and gasoline automobiles. (Riley.)

Riley Engine Co.—Castle Works, Coventry, England. Mfrs. transmission gears.

Riley-Klotz Mfg. Co.—17 Mulberry St., Newark, N. J. Mfrs. horns.

Riley, N. J.—Vice-Pres. Studebaker Automobile Co., South Bend, Ind.

Rim.—The exterior circle of a wheel between the spokes and tire. For pneumatic tires the rim is formed of a circle

of steel, the sides of which are curved inward so as to form "clinchers," and which is placed upon the wooden felly to which are attached the spokes of the wheel. The "bead" of the tire hooks under the clinchers, which holds it fast to the rim. The rims now most used correspond to tires of the external diameters of 65, 75, 85, 90, 105, 120, 135, 150 mm. In designating them, the section of the tire that is to be placed on them is preceded by the external diameter of the inflated tire. Thus, one tire will be designated 650x65, another 810x90, and so on. In England and America, $2\frac{1}{4}$, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$ inch tires are used.

Rim-clutch.—See Clutch, Rim.

Rim, Detachable.—A rim designed to permit of a quick detachment of the tire. Many different forms of such a rim have been devised and consist chiefly of two rings which slip over a rim on the wheel provided with suitable channels or grooves to receive them, and are secured therein by various methods, one of which consists in the use of a turnbuckle to draw the ends of the ring together, thus causing it to grip the rim in the channel.



Other styles of rim are entirely detachable and do not require the removal of the tire therefrom when punctured on the road, since a spare rim having on it a tire already inflated can be attached, and the punctured one repaired at leisure. In the Christie system, shown in the figure, the rims are mounted on specially built wheels having twelve hollow brass spokes for both front and rear wheels. The rims are attached to lugs on the rims by bolts through the ends of each spoke, and a rim can be taken off and another put on in less than a minute.

Rim, Efficiency at.—See Efficiency at the Rim.

Rinehard, A. B.—Akron, O. (White.)

Ring-armature.—See Armature.

Ring-bolt.—See Bolt, Ring.

Ring, Deck.—See Deck-ring.

Ring Lubrication.—See Lubrication.

Ring, M. B.—19 Chestnut St., Norwich, Conn. (Maxwell.)

Ring, Packing.—See Packing-ring.

Ring, Piston.—See Piston-ring.

Riordan & Riggs.—Watertown, N. Y. (Cadillac.)

Riotti, C. C.—Vice-Pres. Standard Motor Construction Co., 180 Whiton St., Jersey City, N. J.

Riotti, E. A.—Sec. Standard Motor Construction Co., 180 Whiton St., Jersey City, N. J.

Ripon Knitting Works.—Ripon, Wis. Mfrs. wearing apparel; gloves and gauntlets.

Rippel Steel Foundry Co., E. G.—31-39 Indiana St., Buffalo, N. Y. Mfr. steel castings.

Rippien, Paul P.—Gen. Mgr. The Autolight & Motor Supply Co., Inc., 506-8 N. Broad St., Philadelphia, Pa.

Ripping-cord.—A cord, which, when pulled by the aeronaut, slits open a panel at the top of the envelope of a balloon and deflates it.

Ripping-panel.—A fabric panel which covers a slit of a certain length in the upper part of the envelope of a balloon, and which the aeronaut, by pulling on what is called a "ripping-cord," detaches in order to deflate the balloon. The ripping-panel is employed in landing, either for instantly deflating the balloon, and thus eliminating dragging, or, after landing, as a normal and rapid method of deflation in conjunction with the valve.

Risden, C. W.—223 W. 8th St., Los Angeles, Cal. (Indian.)

Rising.—A narrow strake immediately below the thwarts in a boat.

Rising & Co., C. E.—Park St., Portland, Me. Repairing.

Risley, W. H.—Venice, Cal. Garage.

Rissman, Carl.—Hanover, Germany. (Monarch.)

Ritchie, G. M.—Supt. Continental Motor Mfg. Co., Muskegon, Mich.

Ritchie, O. N.—Gen. Mgr. and Sole Prop. Advance Mfg. Co., B St., 2 blocks north of Main St., Hamilton, O.

Rittenhouse Garage.—214 to 220 S. 23d St., Philadelphia, Pa. (American Mercedes, Wayne.) Est. 1900. Partnership Charles Fraser and Wilbur F. Reynolds. Garage, 125 cars. Repairing.

Ritter, Henry.—Supt. The Lunkenheimer Co., Cincinnati, O.

Ritter Mfg. Co.—242 Jefferson Ave., Detroit, Mich. Mfrs. wood and metallic bodies, automobile tops, glass wind shields.

Ritter, Wm. J. F.—123 N. Philips St. Youngstown, O. (Peerless, Packard.) Est. 1904. Cap. \$50,000. Repairing.

Rivers-Jacoby Auto Co.—2651 Monroe St., Toledo, O. (Aerocar, Rambler.)

Riverside Auto Transfer Co.—Riverside, Cal. Garage.

Riverside Body Factory.—Buffalo, N. Y. Mfrs. bodies.

Riverside Garage.—10th St., near Market, Riverside, Cal. (Maxwell.)

Riverside Steel Casting Co.—451-473 Riverside Ave., Newark, N. J. Mfrs. crucible steel castings. Cap. \$125,000. Est. 1905. Thomas Malcolm, Pres.; P. S. Kimel, Vice-Pres.; J. S. Kimel, Sec. and Treas.

Rivet.—A short cylindrical fastener of metal with a strong head at one end.

used for forming a joint between overlapping plates, etc. (Fig. 1). The rivet is

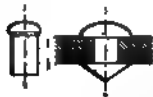


Fig. 1. Fig. 2.

inserted in a hole which has previously been drilled or punched through the plates and is then "closed," that is, a second head is formed by hammering in the cold or while the rivet is still hot from the rivet-forging (Fig. 2). Whether a rivet is inserted hot or cold depends upon its size. Small iron and steel and copper rivets are inserted cold. The rivet is "upset" by means of a "riveter" and hammer. The "riveter" or "set" is a sort of punch, one end of which is hollowed according to the form of the rivet head.

Rivet-joint.—See Joint, Reducing.

Rivet-set.—A tool called also a "cup-set" and "snap," for forming second heads in rivets.

Road.—See Cambered, Corduroy and Macadam Road.

Road-metal.—See Metal.

Road, Rules of the.—See Section 4.

Road-wheel.—See Wheel, Road.

Roanoke Auto Co.—107 Church St., Roanoke, Va. (Rambler.)

Robben, H. J.—Treas. The Victor Rubber Co., Springfield, O.

Roberts, R. M.—140 Indiana Ave., Anderson, Ind. Mfr. gasoline automobile motors.

Robbins, A. L.—Mech. Engineer Sandusky Foundry & Machine Co., Sandusky, O.

Robbins & Co., Irwin.—32 E. Georgia St., Indianapolis, Ind. Mfrs. wood and metallic bodies, automobile tops.

Robbins, G. D.—Cor. Crockett and Loyola Sts., San Antonio, Tex. (Mitchell.)

Robbins, H. G.—Treas. Nungesser Electric Battery Co., 2519 King Ave. N. E., Cleveland, O.

Robbins Mfg. Co., John.—58 Kneeland St., Boston, Mass. Mfrs. license numbers, name plates, steel stamps and stencils.

Roborage, J. A.—Meriden, Conn. (Knox, Winton, Cadillac, Haynes)

Robert et Boisseau.—44 Rue du Bois, Levallois, Seine, France. Mfrs. non-skids.

Robert Instrument Co., The.—56 Shelby St., Detroit, Mich. Mfrs. pocket battery meters for testing batteries, timers, spark plugs, spark coils and battery switches. Est. 1903. H. A. Abrahamson, Pres., Sec., Treas. and Proprietor.

Robert, M.—15 rue de Sclessin, Liège, Belgium. Mfr. wood wheels.

Roberts & Co., O. G.—152 N. Main St., Columbus, O. (Stoddard-Dayton, Glide, Jackson.)

Roberts, David.—Talcott Ave., Rockville, Conn. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

Roberts, E. M.—Pres. and head of Selling Dept. Chase Roberts & Co., West Ave. and 5th St., Long Island City, N. Y.

Roberts, G. G.—Sec., Treas., Pur. Agt., Sales and Adv. Mgr. Racine Boat Co., 16th and Racine Sts., Racine, Wis.

Roberts, Montague.—A New York racing driver, with the E. R. Thomas Motor Co., Buffalo, N. Y., who has figured in nearly all the important contests on road and tracks in the New York district during recent years. He participated in the Vanderbilt Elimination Trials, 1905 and 1906, Atlantic City beach races,



etc. Won the 24-hour Brighton Track race in 1907.

Roberts Non-Skid Motor Tire Co.—Gripwell Works, St. Mary's Row, Birmingham, England. Mfrs. non-skids, leather tires, gauges.

Robertson & Bennett.—Keene, N. H. (Stanley, Rambler.)

Robertson & Doi.—Denver, Colo. Mfrs. automobile tops.

Robertson & Son, J.—Fleetwood, England. Mfrs. steam commercial automobiles.

Robertson, E. B.—204 Washington St., South Norwalk, Conn. Garage.

Robertson, J. W.—Taunton, Mass. (Elmore, Cadillac.)

Roberty, A.—115 rue de Rome, Marseilles, France. Mfr. exhaust horns.

Robin, Joseph G.—Pres. Morris Park Motordrome Club, Times Bldg., 42d St. and Broadway, New York City.

Robinson & Adams Co.—522 Spruce St., Scranton, Pa. (Maxwell.)

Robinson & Cleaver, Ltd.—Regent St., W., London, England. Mfrs. wearing apparel; coats

Robinson Auto Station.—Pleasant St., Worcester, Mass. (Cadillac.) Garage.

Robinson, A. W.—Sales Mgr. Locomobile Co. of America, Main St., Bridgeport, Conn.

Robinson, B. J.—Vicksburg, Miss. (Cadillac.)

Robinson, D. N.—Hattiesburg, Miss. (Waltham.)

Robinson, J. E.—Oil City, Pa. (Elmore)

Robinson, P. R.—Pres. New York Sporting Goods Co., 17 Warren St., New York City.

Robinson, Son & Co., Wm. C.—Baltimore, Md. Mfrs. grease, oils and semi-solid oils.

Robinson, T. F.—352 Market St., St. Paul, Minn. (Reliance.) Agent for Morgan & Wright tires.

Robinson, W. A.—56 Prospect St., Woonsocket, R. I. Garage.

Robinson, W. Herbert.—Pres. Penn Spring Works, Baldwinsville, N. Y.

Robinson, W. W.—Adv. Mgr. Witherbee Igniter Co., 541 W. 43d St., New York City

Robling, Edward.—Scranton, Pa. (Indian)

Robson, E. C.—Asst. Sec. Magnolia Metal Co., 113-115 Bank St., New York City.

Robson Smelting Co.—Broadway and Lathrop, Buffalo, N. Y. Mfrs. babbitt metal.

Roby Co., Sidney B.—208 South Ave., Rochester, N. Y. Est. 1897. Agts. and dealers iron, steel, heavy hardware, carriage woodwork and trimmings, motorcycle and automobile supplies. Sidney B. Roby, Pres.; W. S. Roby, Sec. and Treas.

Roby, Sidney B.—Pres. Sidney B. Roby Co., 208 South Ave., Rochester, N. Y. Garage

Roby, W. S.—Sec. and Treas. Sidney B. Roby Co., 208 South Ave., Rochester, N. Y.

Roche, Frank W.—Secretary Motor World Publishing Co., publishers of Motor World and Bicycling World. Traveling business representative of these papers, covering the western trade chiefly. Has been connected with the bicycle and automobile trades since the early '90s, always with the papers



mentioned. Address, 154 Nassau St., New York City.

Roche, J. T., Jr.—Purch. Agt. Loconobile Co. of America, Main St., Bridgeport, Conn.

Roche, William.—40 W. Broadway, New York City. Mfrs. primary batteries, spark coils.

Rochelle Motor Co.—Main St., New Rochelle, N. Y. Garage.

Rochester Automobile Club.—26 Plymouth Ave. S., Rochester, N. Y. Object: To help promote the interests of automobilists. Org. 1898 by Joseph J. Mandery. H. S. Woodworth, Pres.; H. G. Strong, Vice-Pres.; Bert Van Tuyle, Sec. and Treas.; Hon. John A. Barhite, Attorney; A. J. Rockwood, Consulting Engineer. Directors: Wm. C. Barry, Rudolph Schmidt, F. H. Bettys, Lee Richmond, Griff D. Palmer, F. E. Mason, J. S.

Bingeman, A. F. Crittenden and A. J. Rockwood. Promoted Oct. 13, 1906, hill climbing contest at the Dugway; gymkhana, July 13, 1907, and Orphans Day, Aug. 6, 1907, at Ontario Beach; 200 cars participated.

Rochester Automobile Co.—158 South Ave., Rochester, N. Y. (Lansden, Matheson, Packard, Winton, Columbia, Baker.) Est. 1899. Jos. J. Mandery, Prop.

Rochester Garage.—Rochester, N. H. Repairing.

Rochester Gas Engine Co.—Rochester, N. Y. Cap. \$50,000. J. S. Graham, Pres.; J. J. Leary, Vice-Pres.; W. J. Graham, Sec. and Treas.

Rochester Gas Engine Co.—705 Driving Park Ave., Rochester, N. Y. Mfrs. gasolene marine motors.

Rochester Machine Tool Works, Ltd.—Rochester, N. Y. Mfrs. body irons, steam engines.

Rochester Rubber Co.—55 Main St. E., Rochester, N. Y. Agents Morgan & Wright tires.

Rochet et Schneider, Ltd.—57 Chemin Feuillat, Lyons, France. Mfrs. gasolene automobiles. (Rochet-Schneider.)

Rock-cork.—See Cork, Rock.

Rock Creek Auto & Wagon Works.—2613 Pennsylvania Ave. N. W., Washington, D. C. Garage.

Rocking-frame.—A frame carrying the brush-holders of a dynamo and which permits the point of contact of the brushes with the commutator to be varied at will.

Rock Island Battery Co.—9th and Sycamore Sts., Cincinnati, O. Mfrs. dry cells. Cap. \$150,000. Est. 1903. M. S. Rosenthal, Pres.; M. O. Oettinger, Vice-Pres.; M. A. Loeb, Sec. and Treas.

Rock-leather.—See Cork, Rock.

Rock-oil.—See Petroleum

Rockcr.—The support of a brush in a dynamo or electric motor, by means of which the exact position of the brush can be adjusted. (2) On a gasolene-motor a device carrying the brush or brushes resting on the contact-maker, or commutator and enabling them to be rocked forward or backward so as to secure the advance and retard of the spark.

Rockcr-arm.—A lever, called also a "walking beam," forming part of the valve-actuating mechanism, placed on top of the cylinder and transferring the upward motion of the push-rod into the downward motion of the valve-stem. See Beam, Walking. (2) An arm on a rockshaft, as in the valve-mechanism of a steam engine

Rockermeyer, V.—Würzburg, Germany. Mfr. jacks.

Rockford Automobile & Engine Co.—Rockford, Ill. Mfrs. Federal gasolene automobiles, axles, automobile motors, mufflers and wood wheels.

Rockford Automobile Club.—Rockford, Ill. H. W. Dickerson, Sec.

Rockford Engineering Co.—Rockford, Ill. (Babcock.)

Rockford Kalamazoo Fire Extinguisher Co.—277 W. State St., Rockford, Ill. Cap. \$6,000. Est. 1887. A. E. Bartlett, Pres.; E. E. Bartlett, Vice-Pres.; P. F. Schuster, Sec. and Mgr.

Rockingham Automobile Garage.—13 Vaugham St., Portsmouth, N. H. Garage.

Rockland Garage & Auto Co.—12-20 Winter St., Rockland, Me. Garage.

Rockland Machine & Foundry Co.—42 Morris St., Jersey City, N. J. Garage.

Rod, Connecting.—See Connecting-rod.

Rod, Distance.—See Rod, Radius.

Rod, Piston.—See Piston-rod.

Rod, Push.—See Push-rod.

Rod, Radius.—See Radius-rod.

Rod, Tappet.—See Tappet-rod.

Rcd, Valve.—See Valve-stem.

Roddy.—2 Bvd. des Italiens, Paris, France. Mfrs. wearing apparel; hats, caps and coats.

Rodefild Mfg. Co.—96 W. Main St., Richmond, Ind. Garage.

Rodgers & Co.—710 Gay St., Knoxville, Tenn. (Reo. Rambler, Oldsmobile, Pope-Waverley, Rapid.) Est. 1899.

Rodgers, C. M.—Buffalo, N. Y. (Rapid.)

Rodgers, Ernest.—Plainview, Tex. (Waltham.)

Roe & Sons, Justus.—52 E. Main St., Patchogue, L. I., N. Y. Garage.

Roebing, W.—Sec. Walter Auto Co., Trenton, N. J., and 59-61 W. 66th St., New York City.

Roehm, Albert H.—Sec., Treas. and Gen. Mgr. Detroit Carriage Co., cor Clay and St. Aubin Aves., Detroit, Mich.

Roehm & Davison, Ltd.—91-95 W. Woodbridge St., Detroit, Mich. Mfrs. and jobbers top fabrics, curtain fasteners, celluloid, buttons and tacks, leather, carpet, bows, hair, webbing, etc. Cap. \$200,000. Est. 1867. Herman Roehm, Pres.; C. A. Davison, Vice-Pres. and Treas.; C. M. Roehm, Gen. Mgr.; J. A. Goodwillie, Sec.; C. B. Noyes, Head of Automobile Dept.

Roehm, C. M.—Gen. Mgr. Roehm & Davison Ltd., 91-93-95 W. Woodbridge St., Detroit, Mich.

Roehm, Herman.—Pres. Detroit Carriage Co., cor. Clay and St. Aubin Aves., and Pres. Roehm & Davison Ltd., 91-95 W. Woodbridge St., Detroit, Mich.

Roemer, Emil.—29-31 School St., Webster, Mass. (Maxwell.)

Roessler und Jauernig.—Aussig-sur-Elbe, Austria. Mfrs. motorcycles.

Roger de Montais.—Beauvoir, par-St.-Jean Froidmental, France. Mfr. transmission gears.

Roger-Durand.—99 Bvd. Beaumarchais, Paris, France. Mfrs. non-skids, chains, radiators.

Rogers & Co., Ralph.—316 N. Main St., Burlington, Ia. (Reo, Rambler.)

Rogers, B. C.—Sec. Connecticut Telephone & Electric Co. Inc., 70 Britannia St., Meriden, Conn.

Rogers, C. E.—34 Beach St., Boston, Mass. Mfr. name plates.

Rogers, Clarence M.—1114 Main St., Buffalo, N. Y. (Rapid.)

Rogers, F. O.—Concord, N. C. (Maxwell.)

Rogers, Ford H.—Pres. Detroit White Lead Works, 532-60 E. Milwaukee Ave., Detroit, Mich.

Rogers, G. V.—Sec. Mitchell Motor Car Co., Racine, Wis.

Rogers, Peet & Co.—258, 842, 1260 Broadway, New York City. Mfrs. wearing apparel, goggles, robes, etc.

Rohr, Frank E.—Winchester, Ind. (Logan.)

Rohrer, R. A.—Altoona Motor Car Co., 718 Green Ave., Altoona, Pa.

Roler, J. S.—171-181 3rd Ave., N. Nashville, Tenn. (Rambler.)

Rolfe-Fox Co.—402 N. Livingston Bldg., Rochester, N. Y. Mfrs. lamp lighting devices.

Rolinson, George H. E.—Mgr. (at New York), The Wells Light Mfg. Co., 44-46 Washington St., New York City.

Roller.—A small steel wheel, called also a "cam-roller," mounted at the end of a valve push-rod and which receives the thrust of the nose of the cam, and has the effect of lifting the rod. See Cam-roller. (2) A cylindrical or conical piece of metal used in roller bearings, roller chains, etc.

Roller Bearing.—See Bearing, Roller.

Roller Bevel Drive.—A system used on the Haynes cars, and in which a large sprocket having specially shaped teeth is used instead of the usual large bevel-gear on the differential, while for the bevel-pinion is substituted one having hardened and ground steel rollers set at an angle to match the teeth on the large ring. This form of drive eliminates the side-thrust and is claimed to be very efficient.

Roller, Cam.—See Cam-roller.

Roller-chain.—See Chain.

Roller-contact.—See Timer.

Roller, Friction.—A disk of which the periphery is faced with leather, or which is entirely of leather, and is rotated by simple friction by means of a wheel or plate.

Roller-gear.—See Gear, Roller.

Rollet et Cie.—67 ave. Parmentier, Paris, France. Mfrs. tire pumps and lubricators.

Rolling Friction.—See Friction.

Rollins, Fred M.—Treas. and Mgr.,

The Hoeffcker Co., Motor Mart, Park Square, Boston, Mass.

Rolls Royce Import Co.—1875 Broadway, New York City. (Rolls-Royce.) Est. 1907. Cap. \$50,000. Walter C. Martin, Mgr. Repairing.

Rolls-Royce, Ltd.—14 Conduit St., London, W., England. Mfrs. gasoline automobiles (Rolls-Royce).

Romaine, D. W.—Mercer and Brunswick Sts., Jersey City, N. J. (Marion.)

Roman Automobile Co.—1907 Market St., Philadelphia, Pa. Garage.

Roman Rim Co.—Coventry, England. Mfrs. metallic rims.

Rome Brass & Copper Co.—Rome, N. Y. Mfrs. sheet and rod brass and copper, brass and copper tubing.

Rome Soap Mfg. Co.—Rome, N. Y. Mfrs. hand soaps.

Ronell, A. L.—Fort Dodge, Ia. (Deere.)

Roos Bros.—Van Ness at Bush St., San Francisco, Cal. Supplies.

Roose, J.—46 rue de Bavière, Brussels, Belgium. Mfr. acetylene lamps.

Roosevelt Auto Co., Inc.—Carteret, N. J. (Knox.)

Root, Charles P.—Editor Motor Age. till 1908. B. Chicago, Ill., Jan. 21, 1863. Ed. public school. Mem. Chicago Motor Club, American Motor League. Res. 663 Kimbark Ave., Chicago, Ill. In the trade, motor cars 1902, motor boats 1895. Used first car 1902, motor boat 1895. Recreations: hunting, automobil- ing, boating.

Roots Oil Motor & Motor Car Co., Ltd.—Chichelly St., York Road, Lambeth, London, S. E., England. Mfrs. automobile motors.

Rope-brake.—See Dynamometer.

Rope-drive.—A system of friction-drive employed on the Holsman cars, and in which steel wire and manila rope cables are employed for transmitting the power from the chain-driven counter- shaft to the rear wheels. The ropes are tightened and power is thereby trans- mitted to the rear wheels by a throwing forward of the counter-shaft through the pulling of a long lever at the right of the driver. A differential is unnecessary, since the ropes can slide without dam- age.

Ropiquet, Cl.—214 rue Jules-Barni, Amiens, France. Mfr. coils.

Roscoe, Benjamin.—Winsted, Conn. (Maxwell.)

Rose.—A perforated plate or cap at the end of a pipe to act as a strainer.

Rose Automobile Co.—1st and Walnut Sts., Spokane, Wash. (Aerocar, National, Mitchel, American Mors.) Cap. \$50,000.

Rose, Chas. B.—Designer and Purch. Agt. American Machine Mfg. Co., Cham- plain and Beaubien Sts., Detroit, Mich.

Rose, Clarence H.—1905 Park Row

Bldg., New York City. Mfr. pipe and brass fittings.

Rose, E. B.—537 Mercer St., Jersey City, N. J. (Maxwell.)

Rose, Edw. I.—Fillmore St., Tonawan- da, N. Y. Mfr. motor boats.

Rose Mfg. Co.—910 Arch St., Philadel- phia, Pa. Mfrs. lamps and gas producers for lighting motor cars and boats. Cap. \$50,000. Angelo Myers, Pres.; H. C. Rosenbiuth, Sec. and Treas. Mem. M. & A. M.

Rosena Bros.—Bucyrus, O. (Reo.)

Rosenblatt, J. M.—Greensboro, N. C. (Jackson.)

Rosenbluth & Co., A. J.—106 Park St., New Haven, Conn. Mfrs. enamel.

Rosenbluth, H. C.—Sec. and Treas. Rose Mfg. Co., 910 Arch St., Philadel- phia, Pa.

Rosenebeck, H.—242 Halsey St., New- ark, N. J. Vulcanizing.

Rosensteel, John E.—High St., Ebens- burg, Pa. (Mitchell.)

Rosenthal, Arthur M.—North and De- troit Sts., Kenton, O. (Reo, Premier, Winton.)

Rosenthal, M. S.—Pres. Rock Island Battery Co., 9th and Sycamore Sts., Cin- cinnati, O.

Rosenthal, Maurice J.—Pres. Fort Wayne Gear Co., North American Bldg., Fort Wayne, Ind.

Rosenzweig, Ben., Jr.—Purch. Agent Buick Motor Co., Flint, Mich.

Roseville Motor Car Co.—620 Orange St., Newark, N. J. (Dragon, Pope- Waverley, Compound.)

Ross, A. H.—Flatiron Bldg., Main St., Akron, O. (Reo.)

Ross & Kramer.—5607 S. Halsted St., Chicago, Ill. Repairing.

Ross, Chas. A.—Sales Mgr. British Columbia Automobile Co., 924 Granville St., Vancouver, B. C.

Ross, Courtney & Co., Ltd.—25 Ash- brook Road, London, N., England. Mfrs. tire pumps and lubricators.

Ross, C. W.—E. mira, N. Y. (Haynes.)

Ross Engineering Co.—19 S. Jefferson St., Chicago, Ill. Mfrs. fluid level indi- cators, chimes, horns and electric speed- ometers.

Ross Gear & Tool Co.—849 Main St., Lafayette, Ind. Mfrs. transmission gears and universal joints.

Ross, H. S.—5607 S. Halsted St., Chi- cago, Ill. Mfr. circulating pumps, gaso- line marine motors, mufflers, tire irons, and glass wind shields.

Ross, Louis S.—Newtonville, Mass. Mfr. steam automobiles.

Ross Motor Car Co., C. A.—40 W. Main St., Little Falls, N. Y. Supplies, garage and repairs.

Ross, R. L.—12th St. and 3rd Ave., Columbus, Ga. Garage.

Ross, R. R.—Head of Selling Dept.,

Peerless Motor Car Co. of N. E., 178 Columbus Ave., Boston, Mass.

Rousseau.—5 rue Greffulhe, Levallois, Seine, France. Mfrs. tops.

Rosse Frères.—Breteuil-sur-Iton, Eure, France. Mfrs. tops.

Rossel et Cie.—Sochaux, pres Montbéliard, Doubs, France. Mfrs. gasoline automobiles (Rossel).

Rosselli.—29 via Nizza, Turin, Italy. Mfrs. motorcycle motors and automobile motors.

Rossendale-Reddeway Belting & Hose Co.—Newark, N. J. Mfrs. brake bands.

Rost, J. P.—Kokomo, Ind. Garage.

Roswell Auto Co.—Roswell, N. Mex. (Buick, Pope-Toledo.)

Roswell Hardware Co.—Roswell, N. M. (Maxwell.)

Rotary Converter.—See Converter, Rotary.

Rotary Pump.—See Pump, Rotary.

Rotary Triplex Pump Co.—126-128 S. Jefferson St., Chicago, Ill. Mfrs. power-driven tire inflators.

Rotary Valve.—See Valve, Rotary.

Rotation.—The movement of a body all of the points of which describe circumferences. The common center of such circumference is the center of rotation. The angular speed defines the rotary motion if the trajectory be known, that is to say, the radius of the circumference described.

Rotation, Couple of.—See Couple, of Rotation.

Rotax Motor & Cycle Co., Ltd.—60 Curtain Road, London, E., England. Mfrs. acetylene lamps.

Roth Bros. & Co.—27-29 S. Clinton St., Chicago, Ill. Mfrs. charging apparatus, electric generators, electric motors.

Roth, F. E.—Supt. Witherbee Igniter Co., 541 W. 43rd St., New York City.

Roth Jack & Tool Co.—68 William St., New York City. Mfrs. jacks.

Roth, Jacob.—1117 State St., Erie, Pa. (White, Cadillac, Peerless.)

Roth, Robert.—1423 North Ave., Bridgeport, Conn. Garage.

Rothbucher, Geo. E. R.—102 Hinsdale St., Brooklyn, N. Y. Mfr. wrenches and tools.

Rother, Chas. O.—Sec. Buffalo Dental Mfg. Co., 587-589 Main St., Buffalo, N. Y.

Rotherham & Sons.—27 Spon St., Coventry, England. Mfrs. tire pumps and lubricators.

Rothschild.—131 ave Malakoff, Paris, France. Mfrs. bodies.

Rothschild, Albert.—Wilmington, N. C. (Maxwell.)

Rottenstone.—Finely divided silica left as a powder after siliceous limestones have been acted on by water containing carbonic acid. It is used for polishing articles of metal.

Roue Élastique L. G.—53 bis, rue de

Chateaudun, Paris, France. Mfrs. elastic wheels.

Rou Soleil, La.—3 square Moncey, Paris, France. Mfrs. elastic wheels.

Rounds, Geo. E.—Park Ave., opp. R. R. Station, Plymouth, Mass. Garage, repairing.

Roussey Tire Co., A. J.—621 Harrison St., Fort Wayne, Ind. Garage.

Rover Co., Ltd., The.—Coventry, England. Mfrs. gasoline automobiles (Rover cars).

Rover Cycle Co., Ltd.—Coventry, England. Mfrs. motorcycles (Rover).

Rowe, H. M.—Mgr. White Garage, 1010 Morton St., Baltimore, Md.

Rowland Motor Co.—Chapel and Wallace Sts., New Haven, Conn. Repairing.

Rowlands, Wm. & Harvey.—Frankford, Philadelphia, Pa. Mfrs. leaf springs.

Rowley, H.—Billings, Mont. Garage.

Roy & Co., James.—Watervliet, N. Y.

Mfrs. cloth and carpet trimmings.

Royal Automobile Club, The.—119 Piccadilly, London, W., England. Patron: His Majesty the King; Vice-Patron, H.R.H. The Prince of Wales; Pres., the Duke of Sutherland, K.G.; Vice-Presidents, the Earl of Dudley, P.C., the Earl of Onslow, P.C., G.C.M.G., Lord Stanley, P.C., C.B., Lord Montagu of Beaulieu, Sir David L. Salomons, Bart., Lt.-Col. Mark Mayhew; Chairman, C. D. Rose, M.P.

Royal Automobile Club Journal.—Pub. at 119 Piccadilly, W., London, England.

Royal Battery Co.—108-110 Duane St., New York City. Mfrs. storage batteries, "Royal Multiplex," lamps and attachment. Cap. \$5,000. Est. 1905. Officers: Emil Grossman, Julius Silvermann, Carl Kaufman, and Hugo Gerusback. Gen. Mgr., Hugo Gensback; Foreman, Frank Schalow.

Royal Changement de vitesse.—15 bvd. de Strassbourg, Boulogne-sur-Seine, France. Mfrs. transmission gears.

Royal Equipment Co.—165 Housatonic Ave., Bridgeport, Conn. Mfrs. marine motors, brakes. Est. 1904. A. F. Law, Designer. F. P. Scribner, Supt.; C. M. Hall, Adv. Mgr.

Royal Lubricating Oil Co.—116 Broad St., New York City. Mfrs. oil, automobile body polishes, metal polishes and automobile body soaps.

Royal Metal Steel Co., Inc.—24 State St., New York City. Mfrs. steel and chrome-nickel steel.

Royal Motor.—15 bvd. de Strassbourg, Boulogne-sur-Seine, France. Mfrs. automobile motors.

Royal Motor Car Co.—Gordon Park Blvd. and Lake Shore Tracks, Cleveland, O. Makers of the Royal Tourist car; first marketed in 1901. Eight models made since. Cap. \$1,000,000. E. D. Shurmer, Pres. and Gen. Mgr.; Daniel

Shurmer, Vice-Pres.; A. D. Hatfield, Sec. and Treas.; Robert Jardine, Designer; A. C. Miller, Supt.; B. G. Gilmore, Purch. Agt.; A. D. McLachlan, Sales Mgr.

Royal Motor Works.—30 Russell St., Worcester, Mass. Mfrs. motorcycles.

Royal, P. P.—Drummond, Mont. (Waltham.)

Royal Polish Co.—301-303 W. 63rd St., Chicago, Ill. Mfrs. automobile body polishes.

Royal Tourist Car Co.—1108 E. 15th St., Kansas City, Mo. Garage.

Roydale Engineering Co.—Trafalgar Works, Huddersfield, England. Mfrs. gasoline automobiles (Roydale).

Rubay, Leon.—1697 Broadway, New York City. Est. 1900. Supply dealer and importer Lacoste ignition coils, commutators, magnetos, batteries, wire terminals, plugs, Bleriot lamps, Malicet and Blin ball bearings. Leon Rubay, Pres. and Treas.; Paul Lacroix, Vice-Pres.; Geo. Lamberty, Sec.

Rubber.—The coagulated latex or milk of several plants, mostly of the order Euphorbiaceae, growing in tropical countries. The valley of the Amazons produces annually about thirty thousand tons of rubber, which, from the port of shipment, is known as "Para." This rubber is derived from *Hevea Brasiliensis*. South America produces also other sorts of rubber, from the *Castilloa elastica* which is known as "Centrals," and from the Atlantic states of Brazil are obtained grades of rubber known as "Ceara," "Pernambuco" and "Mangabeira." Africa ranks next to Brazil as a rubber-producing country, and the bulk of the product is from the Landolphia, a vine or creeper. Rubber is an elastic, gummy, tenacious substance, and was originally employed for erasing pencil-marks, whence the popular name of "rubber." Natural rubber consists chemically of hydrocarurets of the family of "terpenes." It is more or less soluble in sulphide of carbon, benzene and its homologues, toluene and xylene, turpentine, petroleum spirits, chloroform, etc. Heated above 250° F., it softens and does not again become hard. This and other properties restricted the industrial applications of rubber till the discovery, by Charles Goodyear, of a process of "vulcanizing" by which it is rendered indifferent even to extreme heat or cold. Vulcanization consists in the mechanical mixture of dry rubber with sulphur, and the exposure of the compound to heat. The effect of the process is to change the rubber from a plastic mass, which becomes sticky on heating and brittle by cold, into a substance which is elastic, but not plastic, unaltered by moderate temperatures and much less liable to deterioration by age. The "cold cure" is

another method of vulcanization which is applied to thin articles, and consists in mixing chloride of sulphur with bisulphide of carbon and dipping the rubber into the mixture. In the electrical industry rubber is widely applied as an insulating material. It is used either in the form of a thin plastic mass which surrounds the wire, and is then vulcanized, or in the form of tape for direct insulation or for making joints. In the form of "vulcanite" or "ebonite" it is of even greater service. One of the most important of the rubber industries is that of the rubber tire—solid tires for cabs, carriages, motor-trucks, etc., and pneumatic tires for cycles and motor-cars.

Rubber.—See File.

Rubber Cement.—A solution of pure rubber in sulphide of carbon used for the repair of rubber and leather articles.

Rubber, Hard.—The same as ebonite, q. v.

Rubber Packing.—See Packing, Rubber.

Rubber Paint Co.—154-156 W. Van Buren St., Chicago, Ill. Mfrs. enamel and varnishes.

Rubber Solution.—Pure rubber dissolved in naphtha. It is manufactured in large quantities and used in repairing tires and other rubber objects.

Rubber Tire Co., The.—1215 Arch St., Philadelphia, Pa. Mfrs. cellular tires.

Rubber Tire Repair Co.—85 E. Gay St., Columbus, O. Vulcanizing.

Rubery & Co.—Darlaston, England. Mfrs. pressed steel frames.

Rubeaky, R. J.—Supt. H. E. Wilcox Motor Car Co., 1030 N. E. Marshall St., Minneapolis, Minn.

Rubidoux-Riverside Auto Co.—Riverside, Cal. Garage.

Rubright, A.—2nd and Market Sts., Canton, O. (Reo, Premier.)

Ruckert Compound Shock Absorber.—66 Leonard St., New York City. Mfrs. shock absorbers.

Rudder, The.—9 Murray St., New York City. Pub. monthly by The Rudder Publishing Co.

Rudder.—A flat frame hooked by pintles to eye-bolts on the stern-post, and providing a means of steering.

Rudder-gudgeon.—A metal brace provided with eyes and bolted to the stern-post of a boat for the pintles of the rudder to work in.

Rudder-head.—The upper end of the rudder-stock.

Rudge - Whitworth, Ltd.—Coventry, England. Mfrs. metallic wheels.

Rudolph, Wm. F.—N. E. cor. Broad and Wallace Sts., Philadelphia, Pa. Est. 1898. Repairing.

Rudy, W. E.—125 E. Market St., Lima, O. (Ford, Premier.)

Rue Mfg. Co.—215 Race St., Philadelphia, Pa. Mfrs. collapsible buckets, drop forgings and ejectors.

Ruede, F. S.—Akron, O. (Dolson.)

Ruegg Frères.—Riedickon-Uster, Switzerland. Mfrs. motorcycles. (Schwalbe.)

Rugee, Fred P.—Vice-Pres. The London Auto Supply Co., 1229-1231 Michigan Ave., Chicago, Ill.

Rugee, Jno. C.—Pres. and Gen. Mgr. Merkle Motor Co., 1099 26th Ave., Milwaukee, Wis.

Ruggles, F. A.—Ware, Mass. Garage.

Ruhl & Johnston.—Decatur, Ill. (Pope-Waverley.)

Ruhrkorff Coil.—See Coil, Induction.

Ruhrkorff, H. D.—A German Scientist who died in Paris in 1877. He invented many electric apparatus, among which is the coil that bears his name.

Ruland, Arthur L.—Pres. La France Motor Co., 753 5th Ave., New York City.

Rumble, John T.—Sales Mgr. Dorris Motor Car Co., 22-38 S. Sarah St., St. Louis, Mo.

Rumsey, Howard C.—Sec. A. & J. Mfg. Co., 26 W. Randolph St., Chicago, Ill.

Rumney, John G.—Treas. and Gen. Mgr. Detroit Steel Products Co., 91 E. Fort St., Detroit, Mich.

Rumpp & Sons, C. F.—Philadelphia, Pa. Mfrs. hampers and watch holders.

Rumsey & Co.—Seneca Falls, N. Y. Mfrs. fuel and air pumps.

Run.—The aft part of a boat's bottom where it fines off from the floor timbers to the stern-post.

Runabout.—A light vehicle of a weight not exceeding 1,000 pounds and with a seating capacity for two persons.

Rundle-Spence Mfg. Co.—Milwaukee, Wis. Mfrs. pipe and brass fittings.

Runek Geo. H.—Mgr. More-Power Co., Lowell, Mass.

Runkle, Jerry.—Gainesville, Fla. (Waltham.)

Runmele, E. H.—807 N. 8th St., Sheboygan, Wis. (Winton.)

Runner.—The channel by which fluid metal enters a mould.

Running-board.—A long board, called also a "foot-board," placed between the mud-guards, at the sides of the car, for facilitating entrance thereinto.

Running-brake.—See Brake, Foot.

Running-gear.—See Gear, Running.

Running Hot.—The same as overheating. See Overheating.

Rusakool Metal Co.—1095 Niagara St. Buffalo, N. Y. Mfrs. babbitt metal.

Ruppe, A. und Sohn.—Apolda, Germany. Mfrs. gasoline automobiles (Piccolo).

Ruprecht Electrical Co.—769 Cedar Ave., Cleveland, O. Mfrs. storage batteries, magnetos and ignitum dynamos, spark coils.

Ruprecht, Louis.—Treas. and Gen. Mgr. Flatbush Motor Car Co., 44-48 Snyder Ave., Brooklyn, N. Y.

Rush, C. W.—2036 Euclid Ave., Cleveland, O. Garage.

Rush, Gardner & Bartlett Co.—Marlin, Tex. (Pope-Hartford.)

Rush, J. K.—Bel Air, Md. (Waltham.)

Rush, N. L.—7 Motor Mart, Park Sq., Boston, Mass. (Northern Pullman, Pennsylvania.)

Rushmore Dynamo Works.—Plainfield, N. J. Mfrs. searchlights, acetylene generators and sirens. Est. 1892.

Russ, F. A.—Motor Sales Co., 1771 Broadway, New York City.

Russel & Hoague.—425 E. Main St., Kalamazoo, Mich. Garage, repairs and supplies.

Russel, Burdett & Ward Bolt & Nut Co.—Port Chester, N. Y. Mfrs. nuts in all sizes, A. L. A. M. or any other standard.

Russel, H. J.—32 Exchange St., Worcester, Mass. Mfrs. automobile tops.

Russell, D. W.—Sec. Treas. and Dir. Hercules Automobile Specialty Mfg. Co., 115 Dearborn St., Chicago, Ill., and 936 Denver Ave., Los Angeles, Cal.

Russell, Eugene Frederick.—Supt. Locomobile Co. of America. B. Ilion, New York. Sept. 30, 1865. Ed. high-school

and self-taught technical, learned machinist trade, afterwards draughtsman and later master mechanic. Mem. clubs: Algonquin of Bridgeport, Quinnipiac of New Haven. Res. 826 Park Ave., Bridgeport, Conn.; Office, 2 Main St., Bridge-

port, Conn. In the trade since March 20, 1898. Used first car March, 1898. In trade first as Asst. Supt. of Pope Mfg. Co., motor vehicle department. Recreations: automobiling, fishing.

Russell, Henry.—Pres. Olds Motor Works., Lansing, Mich.

Russell, J. S.—Prop. Glide Motor Car Co., 327 Baronne St., New Orleans, La.

Russell, L. B., Jr.—Commanche, Tex. (Waltham.)

Russell, T. M.—Middletown, Conn. (Locomobile.)

Russell, W. C.—666 State St., New Haven, Conn. Garage.



Russel, Walter S.—Pres. Detroit Steel Products Co., 91 E. Fort St., Detroit, Mich.

Rust.—See Iron Rust.

Rust, Geo. E.—2201 Second Ave., Seattle, Wash. (Aerocar, Reliance.)

Russits Fur Co., John.—73-77 Mercer St., New York City. Mfrs. wearing apparel.

Rutan Co., P. C.—46 Front St., Port Jervis, N. Y. (Pope-Hartford.) Garage, repairing.

Rutenber Co.—Chicago, Ill. Mfrs. gasoline tank gauges.

Rutile.—A dioxide of titanium containing 98 per cent. of titanitic acid and 2 per cent. of iron. Its specific gravity is 4.2. It cannot be scratched with a knife, but can be marked with a quartz crystal. It is now used in the construction of aeroplanes. The advent of flying-machines actuated by gasoline motors which run at very high speed has proved that bearings and axles of ordinary metals submitted to speeds of 2,500 to 3,000 wear so rapidly and heat so quickly that the necessity has arisen for some metal to stand the strain and velocity without wearing or heating, and this has been found in the metal titanium of which rutile is the purest ore. See Titanium.

Rutland Automobile Club.—Rutland, Vt. Chas. A. Matthews, Sec.

Rutland Machine & Auto Co.—55-61 Wales St., Rutland, Vt. (Buick, Winton, Franklin.) Garage; repairing.

Rutland Motor Co.—76 West St., Rutland, Vt. (Maxwell, Waltham.)

Rutledge Garage.—100 Rutledge St., Brooklyn, N. Y. Garage.

Rutter, C. L.—Henry and New Hampshire Sts., Lawrence, Kan. (Pope-Waverley, Maxwell.)

Rutz, W. A.—Mgr. Continental Caoutchouc Co., Buffalo, N. Y.

Ryan & Co., J. J.—68-74 W. Monroe St., Chicago, Ill. Mfrs. brass, bronze, copper and aluminum castings.

Ryan & Long.—584 Oneida St., Appleton, Wis. Mfrs. vehicle washing apparatus.

Ryan, Garret T.—Phoenix, Ariz. (National.)

Ryan, Harris J.—Stanford University, Cal. (Waltham.)

Ryan, Joseph Edmond Ginnane.—Newspaper editor with Chicago Inter-Ocean. B. The Hermitage, County



Photo by Spencer & Wells

Clare, Ireland, July 14, 1870. Ed. Sacred Heart College, Limerick, Ireland, and Blackrock University, Dublin. Treas. Vaudette Theater Co., Pres. Wonderland Co. and International Pure Food Exposition Co. Mem. Chicago Athletic Ass'n., Exmoor Country, Elmhurst Golf, Columbia Yacht, Chicago Press, Ellerslie Cross Country. Res., 263 Dearborn Ave., Chicago, Ill. Office, 108 E. Monroe St., Chicago, Ill.

Ryan, J. F.—Vice-Pres. Byrne Kingston & Co. and Kokomo Electric Co., 339-51 Smith St., Kokomo, Ind.

Ryan, J. L.—Vicksburg, Miss. Garage.

Ryan, M.—Head of Plating Dept. Jos. N. Smith & Co., 4th and Porter Sts., Detroit, Mich.

Ryan, P. S.—9-10 Central Arcade, Schenectady, N. Y. Garage.

Ryan, T. F.—Vice-Pres. Puget Sound Auto Co., 1405-7 Broadway, Seattle, Wash.

Ryde Motors, Ltd.—Grosvenor Road, West Ealing, London, W., England. Mfrs. automobile motors.

Ryhmman, R. L.—Supt. Continental Automobile Co., St. John and Olive Sts., New Haven, Conn.

Rykert & Gould.—122 California St., Sycamore, Ill. (Cartercar.)

Ryley, J. A.—23½ Martineau St., Birmingham, England. Mfr. spark plugs.

Ryman Co., K. L.—164 Market St., Newark, N. J. Mfrs. drop forgings.

S

S.—Symbol for "sulphur."

S.—Symbol for "surface."

s.—An abbreviation of "second."

Sb.—Symbol for "antimony."

Sn.—Symbol for "tin."

Sp. gr.—An abbreviation of "specific gravity."

S. C. Fabric Tire Tread Co.—1900 Broadway, New York City. Mfrs. anti-skid devices, tire treads.

S. E. I. Co.—Syracuse, N. Y. Mfrs. ammeters and voltmeters.

S-wrench.—See Wrench, S.

Sabella Motor Car Co.—Camden Town N. W., England. Mfrs. gasoline automobiles (Sabella cars).

Sabin, C. H.—3 Congress St., St. Albans, Vt. Garage.

Sabine Supply Co.—Orange, Tex. (Cadillac.)

Sack, F. W.—Vice-Pres. Bassett-Pressley Co., Western Reserve Bldg. Cleveland, O.

Sackett, H. I.—256 Pearl St., Buffalo, N. Y. Garage.

Sacramento Automobile Club.—Sacramento, Cal. H. G. May, Sec.

Sacripanti, G.—38 via Vincenzo, Rome, Italy. Mfr. motorcycles

Saddle, Spring.—See Spring-saddle.

Sadjal, Jante Amovile.—31 quai de Suresnes, Suresnes, France. Mfrs. detachable rims.

Safe Storm Shield Co.—Fremont, O. Mfrs. storm aprons and curtains.

Safety Buggy Co.—Lancaster, Pa. Mfrs. wood and metallic bodies, automobile tops.

Safety Door Hanger Co.—Ashland, O. (Mitchell.)

Safety-fuse.—See Fuse.

Safety-plug.—See Plug, Safety.

Safety-valve.—See Valve, Safety.

Safety Insulated Wire & Cable Co., The.—114 Liberty St. New York City. Factory, Bayonne, N. J. Mfrs. rubber covered, lead covered and armored cables. Cap. \$1,500,000. Le Roy Clark, Pres.; C. E. Graham, Vice-Pres.; G. B. Wilson, Treas.; H. C. White, Sec.; James Ferguson, Supt.

Safety Tank Co.—25 W. 42nd St., New York City. Mfrs. storage tanks.

Safford Mfg. Co., W. F.—Westerly, R. I. Mfrs. gasoline marine motors.

Sager Co., J. H.—Rochester, N. Y. Mfrs. anti-skid devices, shock absorbers, tire chains.

Sage's Trunk Depot.—81 Summer St., Boston, Mass. Mfrs. automobile trunks.

Sagging.—A bending downward produced in a member of a structure by its own weight or that of the load that it carries. See Hogging.

Saginaw Yacht & Motor Co.—Saginaw, Mich. Mfrs. gasoline marine motors.

Sague & Son, Horace.—184-192 Church St., Poughkeepsie, N. Y. (Cadillac.) Supplies, garage, repairs.

Saint Clair Motor Co.—131 Beaubien St., Detroit, Mich. Mfrs. gasoline marine motors.

Saks & Co.—Broadway, 33rd, 34th Sts., New York City. Mfrs. automobile robes, wearing apparel, caps

Salem, Chas. P.—Vice-Pres. Puncture Proof Tire Co., Court House, Cleveland, O.

Salisbury & Son.—14 Tilden Ave., Jamestown, N. Y. Garage.

Salisbury, B. E.—Gen. Mgr. Pass & Seymour Inc., 52 Boyd Ave., Solvay, N. Y.

Salisbury Wheel & Mfg. Co.—Jamestown, N. Y. Mfrs. automobile wheels, front and rear axles. Member M. & A. M. Cap. \$100,000. Est. Oct., 1901. C. A. Pickard, Pres.; Fletcher Goodwell, Vice-Pres.; E. D. Shearman, Treas.; Andrew Davis, Sec.; S. H. Penfield, Gen. Mgr.; E. D. Cook, Gen. Supt.; C. A. McCutcheon, Mechanical Engineer.

Sallander, A. W.—627 Front St., Fort Madison, Ia. (Buick, Cadillac.)

Salleron, Jean.—110 Rue du Bac, Paris. Born at Sens, Sept. 27, 1870. Deputy Administrator of the Auto-Générale. An accomplished sportsman. He ran the Paris-Vienna and Paris-Madrid races (second of the large cars), the Eliminations of 1904, and the Bennett Cup race of 1904.



Salmons, R. H.—Sec. and Gen. Mgr. Selden Motor Vehicle Co., Rochester, N. Y.

Salman & Co., John A.—17 Bromfield St., Boston, Mass. Mfrs. monograms.



Salomons, Baron Goldsmid Stern.—49 Grosvenor St., London. Born at Brighton, England, June 28, 1851. A lawyer and engineer, and author of many books on automobiles, accumulators, electricity, optics, mathematics, etc. One of the best defenders of the automobile in England and even in France.

Salisbury & Son, Ltd.—124 Long Acre, London, W. C., England. Mfrs. acetylene lamps.

Salthouse, J. T.—McPherson, Kan. Garage

Salvador Blasi.—10 calle Pelayo, Barcelona, Spain. Mfr. oil lamps.

Samaritaine, Grand Magasins de la.—rue du Pont-Neuf, Paris, France. Mfrs. wearing apparel, coats.

Sampson Co., Alden.—Pittsfield, Mass. Mfrs. gasoline commercial automobiles.

Samson Leather Tire Co.—1634-42 Broadway, New York City. Mfrs. anti-skid devices, tire treads, leather tires, pneumatic tires.

Samuela, A. L.—Bloomington, Ill. Vulcanizing.

San Antonio Automobile Club.—C. J. Overman, Sec., 218 W. Commerce St., San Antonio, Tex.

Sanborn, E. R.—Garage Dept. E. P. Moriarty & Co., 1612-14 Grand Ave., Chicago, Ill.

Sanborn, E. S.—Ormond, Fla. (Waltham.)

Sanborn, Frank W.—176 N. Main St., Concord, N. H. (Rambler.)

Sanborn, L. W.—Partner Linz-Sanborn Automobile Co., 505 Golden Gate Ave., San Francisco, Cal.

Sanchez-Jaurez & Co.—P. O. Box 1225, Mexico City, Mex. (Peerless.) Garage.

Sand.—Fine sand, after being perfectly dried in a stove, is frequently employed in mechanics for filling the insides of copper and iron tubes which are to be curved when heated.

In case of fire, sand and earth are the best extinguishers, where there is no great quantity of water at hand; and sand is undoubtedly the best medium for the rapid extinction of burning gasoline or oils, the material acting by absorption.

The principal element in moulding sand, now clayey, now mixed with grit, more or less siliceous, must be sufficiently plastic to take a sharp imprint of the object to be moulded. Its plastic qualities are increased by braying and sifting, and mixing it with pulverulent materials, the nature and proportions of which vary according to the metal to be cast or the character of the pieces to be moulded.

Sand-blast.—When mechanical pieces after brazing and forging are hard to work because of the "skin" and vitreous glaze which are formed on their surfaces, they are submitted to the action of a "sandblast."

This means the projection, on the piece, of a jet of fine sand, driven at great velocity by means of steam or compressed air. Each particular grain of sand acts as an abrasive, which penetrates all the interstices of the piece, and cleans and scrapes it very quickly.

Sand-boils.—Protuberances, called also "blisters," on one side of a tire caused either by sand working in through a cut and collecting in one or more places, or by the separation and granulation of the rubber between each layer of fabric.

Sand-paper.—See Paper, Sand.

Sandborn, F. E.—Supt. Albert Champion Co., 541 Tremont St., Boston, Mass.

Sander & Co., J. M.—Akron, O. (Cartecar.)

Sanders, L. B.—Gen. Mgr. Motor Car Dept., Fiss, Doerr & Carroll Co., 153 E. 24th St., New York City.

Sanders, Leslie B.—Vice-Pres. Parkway Garage Co., Central Pk. W., and 110th St., New York City, and Gen. Mgr. Motor Car Dept., Fiss, Doerr & Carroll Co., 153 E. 24th St., New York City.

Saunderson, A. J.—Mgr. Sales Dept. Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y.

Sandford, Edw. B.—Warwick, N. Y. Garage.

Sands Electric & Mfg. Co., H. S.—1143 Market St., Wheeling, W. Va. (Rambler.)

Sands Garage, H. B.—523 Bergen St., Brooklyn, N. Y. Garage.

Sandt, Geo. M.—333 Broad St., Redbank N. J. (Maxwell.)

Sandusky Foundry & Machine Co.—Sandusky, O. Mfrs. gasoline engines. Cap. \$100,000. Est. Jan., 1902. W. H. Mulpaugh, Pres.; Sidney Frohman, Sec.; J. J. Dauch, Treas.; A. L. Robbins, Mech. Engineer.

Sandwick, F. W.—913 N. Howard St., Baltimore, Md. Garage.

Sandford Automobile Co.—Sandford, Me. (Cadillac)

Sandford, F. L.—Co-partner the Harrington Garage, Worcester, Mass.

Sandford, M. C.—Clyde, O. (North ern.)

San Francisco Automobile Trade Association.—San Francisco, Cal.

San Francisco Motor Co.—Berkeley, Cal. (Dolson.)

Sangamo Auto Garage Co.—Springfield, Ill. (Queen.)

Sanger, E. F.—Milwaukee, Wis. (Maxwell.)

Sanger, Geo. T.—206 W. Main St., Orange, Franklin Co., Mass. (Waltham, Reo, Yale motorcycles.) Est. 1904. O. D. Hapgood, Repair Dept.; G. T. Sanger, Sale Dept. Garage, six cars. Repairing.

Sanger, G. T.—Sales Dept., Geo. T. Sanger, 206 W. Main St., Orange, Franklin Co., Mass.

San Giorgio, Societa Italiana per Costruzioni di Automobili.—Sestri Ponente, Italy. Mfrs. gasoline automobiles (San Giorgio cars).

San Luis Auto & Machine Co.—San Luis Obispo, Cal. (Maxwell.)

Sanroma, Alfonso.—238 calle Aragon, Barcelona, Spain. Mfr. motorcycles.

Sans, J. B.—10 rue de l'Oasis, Puteaux, France. Mfr. shock absorbers.

Santa Ana Machine & Foundry Co.—Santa Ana, Cal. Mfrs. steam engines.

Santa Maria Garage.—Santa Maria, Cal. Garage.

Santa Monica Garage.—Santa Monica, Cal. (Maxwell.)

Santa Rosa Garage.—5th St., Santa Rosa, Cal. (Winton.)

Santos-Dumont, Alberto.—150 Avenue des ChampsElysees, Paris, France. Born at Sao-Paulo, Brazil, July 20, 1873, of parents of French origin. Chevalier of the Legion of Honor. He went to France when very young, and, as long ago as 1898, made himself well known as an automobilist and aeronaut. Conceiving

the idea of installing an internal combustion motor on a dirigible balloon, he constructed and navigated several successive models of the "Santos-Dumont," with which he obtained a success that attracted the attention of the public to the dirigibility of balloons.

The Aero-Club instituted a prize to which 100,000 francs was generously added by M. Henry Deutsch for a dirigible balloon which, starting from the park of the Aero-Club, should return thither in 30 minutes after doubling the Eiffel tower.

The prize was won by Santos on "Santos-Dumont VI." He afterwards constructed some new types of dirigibles, of which No. X figured at the review of July 14, 1903, at Longchamp. The celebrated aeronaut is still pursuing his experiments with the same ardor and the same courage that has rendered him so popular.

Saratoga Auto Top Co.—107 W. 46th St., New York City. Automobile repairing.

Saris, J. H.—Beloit, Wis. Mfr. carburetters.

Sarolea, Maison.—269 rue St. Lambert, Herstal, Belgium. Mfrs. motorcycles, tricars (Sarolea), motorcycle motors.

Sartus Ball Bearing Co.—155 Spring St., New York City. Mfrs. ball retainers, separators. Not inc. Est. 1896. G. E. Strauss, Gen. Mgr.

Sarver, Herman.—Muncie, Ind. (Waltham.)

Saturation.—A term applied to the condition of a vapor when it is at the maximum density and pressure which correspond to its temperature. "Saturated steam" is steam in the condition of saturated vapor.

Saturation, Magnetic.—A term used with regard to a magnet when it has been magnetized as strongly as possible.

Sauerbier, Franz.—5 Forsterstrasse, Berlin, S., Germany. Mfr. radiators.

Saule e Pusterla.—41 via Lecco, Como, Italy. Mfrs. motorcycles.

Saulpaugh, C. H.—Mankato, Minn. Garage.

Saurer, Adolph.—Arbon, Switzerland. Mfr. gasoline commercial automobiles (Saurer trucks), automatic starters.

Sauser Jacggi und Co.—Soleure, Switzerland. Mfrs. spark plugs.

Savage, A. B.—Asst. Sec. Franklin H. Kalbfleisch Co., Broadway and 16th St., New York City.

Savannah Auto Brokers.—12 Bull St., Savannah, Ga. Garage.

Save'll, J. E.—Vice-Pres. and Gen. Mgr. Concord Motor Car Co., 64 Huntington Ave., Boston, Mass.

Save'll, J. E.—204 35th St., Chicago, Ill. Garage.

Saw.—An instrument consisting of a serrated thin blade of steel, the teeth of which cut wood or metal by a rasping action. The groove made by a saw is technically called a "kerf." Of the forms of the instrument that will prove useful in a garage, may be mentioned the "hand-saw," for cutting wood; the "hack-saw," for cutting metal, and the "keyhole saw," for cutting along a curve or in a very narrow space.

Sawyer & Co.—Banister Road, Kensal

Rise. London, W., England. Mfrs. non-skids.

Sawyer Carriage Co.—Lowell, Mass. (Autocar, Corbin.)

Sawyer, E. C.—Prop. and Mgr. Asheville Cycle & Auto Co., 15-17 Lexington Ave., and 18-20 Church St., Asheville, N. C.

Sawyer, Floyd.—Brighton, Mich. (Waltham)

Sawyer, J. W.—Fairfield, Me. Garage. age.

Saxon, H.—Sec. 35 Per Cent. Auto Supply Co., 83 Chambers St., New York City.

Saxon Lamp Co.—526-32 W. 28th St., New York City. Mfrs. lamps, annunciators, generators.

Saxonia Akkumulatorenwerke. — 30 Kreuzbergerstrasse, Berlin, Germany. Mfrs. storage batteries.

Sayers & Co.—Vauxhall, London, England. Mfrs. bodies.

Sayers & Scovill.—2247-2261 Colerain Ave., Cincinnati, O. Makers of the Sayers & Scovill truck; first marketed July 1, 1906. One model. 1½ tons capacity. Partnership concern, above members. Walter Lang, Purch. Agt.; C. A. Eisenhardt, Sales and Advt. Mgr. Agents and dealers: Cycle & Auto Co., Davenport, Ia.; W. S. Bulett, S. W. cor. 53rd and Webster Sts., W. Philadelphia, Pa.

Sayle, W. F.—Co-partner. Collister & Sayle, 224 Superior Ave. N. W., Cleveland, O.

Sayre Machine & Auto Co.—104 Cross St., Sayre, Pa. (Cadillac.)

Scachi, Sig.—Supt. Fiat Automobile Co. (Fabbrica Italiana Automobili Torino), Turin, Italy.

Scale.—An incrustation of lime that forms in the water-jackets of gasoline motors and in the tubes of water-tube boilers and those of honey-comb radiators. See Fur. (2) A rod or bar of metal, wood, or glass bearing graduations for use in measurement.

Scandinavian Fur & Leather Co.—16 W. 33rd St., New York City. Mfrs. automobile robes, caps, gloves and gauntlets, miscellaneous wearing apparel.

Scarf.—A lapped joint made by beveling off the ends of two pieces of wood and bolting or strapping them together so as to form one continuous piece. (2) A piece of metal beveled for a scarf-weld

Scarf-weld.—See Weld, Scarf.

Scarfotti, Adv.—Pres. Fiat Automobile Co. (Fabbrica Italiana Automobili Torino), Turin, Italy.

Scarritt, Winthrop E.—Broker. B. Dorchester, Ill., June 17, 1857. Ed. Bunker Hill Academy and Westfield Col-

lege, Ill.; De Pauw University, A. B. A. M.; in 1882 be-



Photo by Spencer & Wells

came professor of belles lettres, State University of Colorado, Boulder, Colo.: 1885, banker, Watertown, S. Dak.; 1893, broker, N. Y. City; member of first Constitutional Convention of S. Dak.; Pres. Commonwealth Trust Co., 1901-1903; Pres. Automobile Club of America, 1904; member of Phi Kappa Psi fraternity; author of "Three Men in a Motor Car." Recreations: automobiling, tennis, boxing. Address, 24 Broad St., New York City.

Scatt, J. H.—Supt. Bryant Motor Co., 110 W. 41st St., New York City, and 1675 Broadway, New York City.

Scavenging.—A term used of the fourth and last motor stroke in which the piston expels the spent gases from the cylinder.

Schaaf Garage.—Fulton and Cumberland Sts., Brooklyn, New York. Garage.

Schaal, W. R.—27 N. Jefferson St., Chicago, Ill. Mfr. timers.

Schacht, G. A.—Pres., Mgr., Designer and Supt. Schacht Mfg. Co., 2727-31 Spring Grove Ave., Cincinnati, O.

Schacht Mfg. Co.—2727-31 Spring Grove Ave., Cincinnati, O. Makers of the Schacht runabout (buggy type); first marketed in 1902. Three models made since. Cap. \$100,000. G. A. Schacht, Pres., Gen. Mgr., Designer and Supt.; Louis J. Day, Pur. Agent; Walter Ilg, Sales and Advt. Mgr. New London, Conn.

Schade, Henry.—323 Central Ave., Albany, N. Y. Garage.

Schaeffer & Budenburg Mfg. Co.—Foxboro, Mass. Mfrs. pressure gauges for water circulation, feed pressure, air, gasoline, etc., for motor cars, patent anti-vibration pressure gauges, glycerine filled tachometers for power boats, indicators for gas engines. Cap. \$100,000. Est. 1878. Officers, R. E. Frommeyer, E. Bultmann, C. E. Georgi.

Schaefer & Co.—11 E. 2nd St., Dayton, O. (Indian)

Schaeffer et Budenburg, Société Anonyme.—105 bvd. Richard-Lenoir, Paris, France. Mfrs. gauges.

Schaeffer and Budenburg.—Buckau, Magdeburg, Germany. Mfrs. gauges.

Schaeffer und Co.—Schweinfürth, Germany. Mfrs. ball bearings.

Schaeffer and Oehlmann.—Chaussee-strasse 46, Berlin, Germany. Mfrs. circulating pumps, lubricators.

Schaeffer, Geo. B.—Sec. Reading Metal

Body Co., Reading and Fleetwood, Pa.

Schafer, R.—Albany, N. Y. Garage.

Schaffer Machine Mfg. Co., The.—211 N. Calvert St., Baltimore, Md. Mfrs. body irons.

Schaffer Mfg. Co.—308 N. Calvert St., Baltimore, Md. (Rapid, Jackson, Pullman.)

Schalow, Frank.—Foreman Royal Battery Co., 108-10 Duane St., New York City.

Scharlach, Otto.—Nürnberg, Germany. Mfr. acetylene lamps, oil lamps.

Scheele, Heinrich.—Lindentahl, Köln, Germany. Mfr. electric automobiles.

Scheidig & Co., John.—50 Maiden Lane, New York City. Mfrs. eye shields, hydrometers, lamp reflectors.

Scheffentrager, E. J.—Cleveland, O., and 41 Leader Bldg., Pittsburg, Pa. (Matheson.)

Schemmel, Geo. C.—Wapakoneta, O. (Maxwell.)

Schenck, M.—Supt. Miami Cycle & Mfg. Co., Grand Ave., Middletown, O.

Schenectady Automobile Exchange & Supply Co.—Schenectady, N. Y. (Maxwell.)

Schenley Automobile Co.—3994 Forbes St., Pittsburg, Pa. (Knox.)

Scherer & Co., H.—Detroit, Mich. Mfrs. bow sockets, top fixtures, metal trimmings.

Scherer, Williams Co.—30 Lewis Wharf, Boston, Mass. Mfrs. hampers.

Schiemer, Jacob.—Gen. Supt. Puritan Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

Schild et Cie., B.—Bienne-Madretsch, Switzerland. Mfrs. motorcycles (Cosmos).

Schilder, Jos. L.—Pres. Logan Construction Co., 2nd and Carroll St., Chillicothe, O.

Schifge, E.—20 rue Ste-Croix-de-la-Bretonnerie, Paris, France. Mfr. horns.

Schilling, —.—Santa Rosa, Cal. (Maxwell.)

Schirck, E.—22 Spring St., Rochester, N. Y. Garage.

Schlegel, C. G.—Kennesaw, Neb. (Waltham.)

Schley, Grant B.—1st Vice-Pres. Electric Storage Battery Co., Allegheny Ave., and 19th St., Philadelphia, Pa.

Schlig & Moore Auto Wks.—Evans-town, Ill. Garage.

Schlosser Mfg. Co.—151 E. 126th St., New York City. Mfrs. gasoline automobile motors, gasoline marine motors.

Schlosser, R. J.—25 E. Pennsylvania Ave., Warren, Pa. (Cadillac, Winton.)

Schmelz, C.—40 ave. Parmentier, Paris, France. Mfr. transmission and differential gears.

Schmid-Roost, J.—Oerlikon, Switzerland. Mfrs. high-tension magnetos, ball bearings.

Schmid, Wm.—Gen. Foreman Muncie Auto Parts Co., Elliott St., and L. E. and W. Yards, Muncie, Ind.

Schmidt, A. G.—1404 Michigan Ave., Chicago, Ill. (Clement-Bayard.)

Schmidt Auto Co.—327 S. Gilbert St., Iowa City, Ia. (Mitchell.) Garage, 6 cars. Repairing.

Schmidt Motor Car Agencies, C. E.—445 Golden Gate Ave., San Francisco, Cal. (Moon.)

Schmidt, Charles.—Chief engineer and designer Peerless Motor Car Co. since

1905. B. France, 1869. Ed. graduate the Ecole des Arts and Metiers, Angers, France (school of Arts and Crafts). Came to America in 1901. Joined the Packard Motor Car Co. in April, 1902. Designed and built the first 4-cylinder



Packard Patented the first bevel gear drive in France in 1898.

Schmidt, Ed.—Mineola, L. I., N. Y. (National, Rambler.)

Schmidt, Société Anonyme des Accumulateurs.—10 rue Fournier, Clichy, Seine, France. Mfrs. storage batteries.

Schmitt Bros.—Dowagiac, Mich. (Jackson.)

Schmitt, Louis H.—Vice-Pres. and Sec. H. D. Smith & Co., Plantsville, Conn.

Schmitz und Co., J.—Höchst-am-Main, Germany. Mfrs. carbureters, circulating pumps.

Schnaufferl, Daa.—Pub. at Armullstrasse, Munich, Germany.

Schneer, Jos. J.—1009 N. J. St., Sacramento, Cal. Garage.

Schneider et Cie.—16 rue de la Chaussée d'Antin, Paris, France. Mfrs. wearing apparel, coats.

Schneider, F.—Supt. The Van Dorn & Dutton Co., 2714 E. 79th St., Cleveland, O.

Schneider, Jac.—Hd. of Tool Room, Globe Machine & Stamping Co., 3868 Hamilton Ave. N. E., Cleveland, O.

Schneider, P. J.—187 Jefferson Ave., Detroit, Mich. (Columbia, Pierce-Arrow, Pope-Toledo, Franklin, Stevens-Duryea.)

Schnitzler, Paul C.—Vice-Pres. The Buene Steel Wool Co., 93 Nassau St., New York City.

Schoeffel Auto & Livery Co.—26 Plymouth Ave. Rochester, N. Y. (Royal.)

Schoelkopf Mfg. Co.—Madison, Wis. Mfrs. lubricators.

Schoening, M. E.—369 Broadway, New York City. Importers, horns, exhaust horns.

Schofield, Mason & Co.—Fairhill, Reese and Cumberland Sts., Philadelphia, Pa. Mfrs. carriage carpets, wool and jute. Est. 1837. Howard S. Anderson, Mgr. of above dept.

Schönlein, P.—32 Frankfurterstrasse, Wiesbaden, Germany. Mfrs. automobile motors.

Schoonfeldt, J. L.—Hd. of Machine Shop, Puritan Machine Co., 12-16 Gratiot Ave., Detroit, Mich.

Schoonmaker, A. O.—221 Fulton St., New York City. Mfrs. mica, washers.

Schopflochen, Ludwig.—Fürth, Germany. Mfr. goggles.

Schrack & Co., C.—152 N. 4th St., Philadelphia, Pa. Mfrs. packing, varnishes.

Schrader's Sons, A.—32 Rose St., New York City. Mfrs. pressed steel products.

Schraeder, George.—Sec. J. S. Kirk & Co., 360 N. Water St., Chicago, Ill.

Schram, J. C.—Marietta, O. (Jackson.)

Schreiber, W.—132 W. 49th St., New York City. Garage; repairing.

Schröder und Co., H.—Berlin, N. W., Germany. Mfrs. motorcycles. (Nikor.)

Schroeder, A. F.—Sec., Treas. and Gen. Mgr. Globe Machine & Stamping Co., 3868 Hamilton Ave., N. E., Cleveland, O.

Schroeder, G. H.—Stroudsburg, Pa. Garage.

Schroeder, H.—229-231 W. Market St., York, Pa.; Railroad, York Co.; Shrewsbury, Pa. (Premier, Reo, Pullman.) Est. 1903. H. Schroeder, Prop. Garage, 20 cars. Repairing.

Schroeder, J.—Sec. Pierce Engine Co., 2200 Clark St., Racine, Wis.

Schubert Bros. Gear Co.—42-44 Cedar St., Oneida, N. Y. Mfrs. automobile bodies, trunk racks, tire holders, extra seats, tops, slip covers, fenders. Cap. \$75,000. Est. 1888. Geo. Schubert, Pres. Mgr. and Hd. coach and carriage dept.; A. A. Woodruff, Mgr. automobile dept.; C. A. McMeikin, Chief Draftsman; A. Bristol, Treas.; C. A. Halliday, Sec.

Schubert, Geo.—Pres., Mgr. and head coach and carriage dept., Schubert Bros. Gear Co., 42-44 Cedar St., Oneida, N. Y.

Schubert, Max.—Chemnitz, Germany. Mfr. gauges.

Schuett & Schaaf.—Woodstock, Ill. (International.)

Schug Bros.—Berne, Ind. (Mitchell.)

Schug Electric Co., The.—326 Jefferson Ave., Detroit, Mich. Mfrs. storage batteries, electric controllers, spark coils, spark plugs, electric switches.

Schuh & Co.—Kentland, Ind. (Waltham.)

Schulte, B. W.—2 Lyceum Ave., Scranton, Pa. (Rambler.)

Schulte, G. W.—Wyoming and W. Market Sts., Wilkesbarre, Pa. Garage.

Schultz, Chas. C.—New Orleans, La. (Waltham.)

Schultz, J. H.—Blacksburg, Va. (Ford, Rambler, Logan.)

Schultz, Paul.—Ogersheim, Germany. Mfr. electric commercial automobiles. (Trucks).

Schultz und Hesse.—Rummelsburg-Berlin, Germany. Mfrs. springs.

Schuman Carriage Co.—Honolulu, Hawaiian Is. (Ford.)

Schurmeier Wagon Co.—29 Western Ave., Minneapolis, Minn. Mfrs. wood and metallic bodies.

Schusser, Franz.—Fürth, Germany. Mfr. goggles.

Schuster, P. F.—Sec. and Mgr. Rockford-Kalamazoo Fire Extinguisher Co., 277 W. State St., Rockford, Ill.

Schutter, C. F.—Purch. Agt. Lansden Co., 54-56 Lackawanna Ave., Newark, N. J.

Schwalbach, Alex.—Show press agent, publicity promoter Darracq Co. Born Brooklyn, N. Y., Sept. 10, 1855. Ed. public schools, private tutor. Mechanical text writer, music show, motor boat, sportsman's show, mining show. Editor Automobile Topics March 15, 1904, to Feb. 1, 1905, staff contributor 1903. Editor Motor June, 1905, to April, 1906. Staff N. Y. American May 1 to Oct. 15, 1906. Editor "Man in the Auto," Leslie's Weekly, 1905 to July 1, 1907. Address 2168 85th St., Bensonhurst, Brooklyn, N. Y.

Schwartz, Harry D.—Crown Point, Ind. (Waltham.)

Schwartz, J. I.—Bridgeton, N. J. (Rapid.)

Schwarz e Cia.—Genoa, Italy. Mfrs. jacks.

Schwarz Wheel Co.—Glenwood Ave. and 20th St., Philadelphia, Pa. Mfrs. wood wheels.

Schwarzkopf, Emile E.—Publisher International Motor Cyclopaedia, Automobile Topics since 1900. B. Austria, Dec. 17, 1852. Came to America in early eighties. Managing editor Automobile Magazine 1899-1900. Built in 1897 and patented in 1898 a four-cyl. motor, pat. No. 280,431. Office, Times Bldg., Times Sq., New York City.

Schwender Bros.—Mankato, Minn. (Pierce Racine.)

Schwerin, J. A.—Sumter, S. C. (Northern.)

Scientific American.—361 Broadway, New York City. Pub. weekly by Munn & Co.

Scientific Shop, The.—1230 Monon Bldg., Chicago, Ill. Mfrs. hydrometers.

Sclaverand, E. (Morin, Successor).—48 rue d' l'Aqueduc, Paris, France. Mfr. tire pumps, lubricators.

Scofield, A. E.—Hd. of Launch Dept. D. M. Tuttle Co., Canastota, N. Y.

Scofield, H. C.—Sec. and Treas. Sturgeon Bay Boat Mfg. Co., Sturgeon Bay, Wis.

Scott, A. D.—3916 Washington Ave., St. Louis, Mo. (Mitchell.)

Scott, A. J.—Rugby, N. D. (Northern.)

Scott, Chas. B.—119 Franklin Ave., Scranton, Pa. Garage.

Scott, D. C.—Anaconda, Mont. (Pope-Hartford.)

Scott, Geo. J.—Sec. and Treas. Geo. J. Scott Motor Co., 1720-22 Broadway, New York City.

Scott, G. N.—Vice-Pres. and Director Hercules Auto Specialty Mfg. Co., 115 Dearborn St., Chicago, Ill., and 936 Denver Ave., Los Angeles, Cal.

Scott, J. Arthur.—Pres., Director and Pacific Coast Rep. Hercules Auto Specialty Mfg. Co., 115 Dearborn St., Chicago, Ill., and 936 Denver Ave., Los Angeles, Cal.

Scott Motor Co., Geo. J.—1720-22 Broadway, New York City. (Glide, Jackson.) Est. 1901. Cap. \$25,000. J. Michaels, Pres.; Geo. J. Scott, Sec. and Treas. Garage, 30 cars. Repairing.

Scott Mfg. Co.—Adele, Ia. (Holsman.)

Scott Muffler Co., The.—71 Gallia St., Portsmouth, O. Mfrs. wearing apparel; mufflers.

Scott, R. H.—Vice-Pres. The Hildreth Mfg. Co. and Gen. Mgr. Reo Motor Car Co., Lansing, Mich.

Scott, Robert Pittis.—Mfr. canning machinery and automobiles. B. Lisbon, O., Oct. 1, 1851. Ed. public schools,

John's Hopkins University. Director Sinclair-Scott Co., Baltimore, Md.; W. R. Roach & Co., Hart, Mich.; Chisholm - Scott Co., Cadiz, O.; Harrison National Bank, Cadiz, O. Mem. A. C. A., A. C. Maryland. Res. Cadiz, O., and Baltimore, Md. Office Cadiz, O. In the



trade since 1895. Experimented 1892 with airship. Experimented off and on for 15 years on aerial locomotion; since 1896 on automobiles. Recreations, automobiling, hunting.

Scott, George Isham.—Broker. B. New York, Dec. 27, 1871. Ed. St. Paul's (Concord), Columbia University. Mem. clubs: A. C. A., Union, Racquet, Tuxedo, Rock-away Hunt, N. Y. Yacht. Res. 28 W. 57th St.; office, 24 Broad St., New York City. Used first car, 1½ hp. De Dion tricycle. 1897.

Scottdale Automobile Co.—Scottdale, Pa. (Stearns, Franklin.)

Scotte Société des Chaudières et Voit-

ures a Vapeur.—56 rue de Provence, Paris, France. Mfrs. steam commercial automobiles (Scotte trains, omnibus, trucks).

Scouring.—The operation of cleaning the surface of metals in order to free them from the oxides, sulphides, carbonates, etc., which foul them. The operation is performed by means of chemical products, such as acids or reagents, more or less diluted with water, and the nature of which varies with the metal to be scoured.

Scovill & Peck.—15 Wooster St., New Haven, Conn. Mfrs. electric, oil and gas automobile lamps, gas generators. Est. 1893. H. J. Gartland, Pres.; E. E. Peck, Treas. and Mgr.

Scoville Mfg. Co.—Waterbury, Conn. Mfrs. sheet and rod brass and copper, oil cans, tire valves.

Scranton Forging Co.—Scranton, Pa. Mfrs. drop forgings.

Scranton Garage & Motor Co.—Merchants' & Mechanics' Bank, 419 Spruce St., Scranton, Pa. (Buick, Cadillac, Franklin, Pope-Toledo, Pope-Hartford, Matheson.)

Scraper.—A tool used in scraping and surfacing metal. There are many forms of it, the shape of the blade depending on where it is to be used, curved scrapers being employed for curved surfaces, and triangular for broad, flat surfaces. An old file ground to a sharp edge may be used as a substitute.

Scratch-brush.—See Brush (2).

Screen, Magnetic.—A massive iron cylinder, placed in the interior of a magnetic field for absorbing its lines of force and for protecting the apparatus that contains it from the influence of such field. Magnetic screens are used for protecting the magnetized needles of galvanometers against the disturbances due to surrounding magnetic masses.

Screen, Wind.—See Wind-screen.

Screw.—A cylinder, usually of metal or wood, on which is cut a helical groove, by means of a stock and die or a lathe. The portion of the original material which remains between the parts cut away is termed the "thread." The distance between the consecutive turns of the thread is termed the "pitch," which may be either "coarse" or "fine." The "depth of the thread" is the depth of the groove. The top of the screw, which may be flat, round, hexagonal, etc., is called the "head" and may be provided with a slit, nick, or square; the cylindrical portion is termed the "barrel" or "stem," and the lower extremity the "point." According to the direction of its thread, the screw is called a "right-hand" or "left-hand" screw.

The screw should not be confounded with the "bolt," which is a screw ending

with a nut. The screw is never provided with a nut. See Nut. A screw may be square-threaded or V-threaded. Square-threaded screws, the groove of which is rectangular in form, are used especially for the production of great stresses, as in presses and testing-machines.

Screws are classified by the forms of their thread, as (1) V-thread; (2) English standard; (3) U. S. standard; (4) bastard; (5) ratchet; (6) square; and (7) wood.

The V-threaded screw has rather the form of a trapezium, the top of the thread being flat in some systems and round in others. If two or more grooves be cut round the same cylinder, parallel with each other, a "two-threaded," or "multiple-threaded," screw is produced.

Screws with a round head and a slit are sometimes difficult to loosen. It is especially important not to manipulate them with too small a screw-driver, which can have no other effect than to make the edges of the slit jagged and to gradually widen the slit itself to such an extent as to render it impossible for the blade of the tool to obtain a purchase.

If the screw has a projecting and cylindrical head it may, if the screw-driver fails to move it, be started by a pipe-wrench, but with merely one turn of the latter, so as not to injure it. If the head of the screw does not project, the blade of a screw-driver as wide as the slit should be inserted in the latter and held as upright as possible while it is being turned; and, if the screw is a strong one, the blade of the tool should be fitted to a hand brace in order to obtain greater power, while a little kerosene should be applied to the parts surrounding the screw. If the slit has become worn it may be renovated by means of a hammer and a fine chisel.

Screw, Adjusting.—A fine-threaded screw for regulating the position or taking up wear of some part of a machine or piece of apparatus.

Screw-band.—A clip or band for binding together the leaves of an elliptic spring.

Screw-barrel.—See Screw.

Screw, Binding.—A screw called also a "terminal," provided with a knurled-headed nut to which a wire inside an electrical apparatus is brought for the purpose of enabling the outside wires to be easily connected.

Screw-blade.—One of the blades of a screw propeller.

Screw-bolt.—An ordinary bolt. See Bolt.

Screw, Cap.—A screw-bolt with a cubic head used in screwing the ends of a steam cylinder.

Screw-clamp.—See Clamp, Screw.

Screw-contact.—A screw for making

adjustments in a contact-breaker. Its extremity is provided with a small piece of platinum, a metal that withstands the oxidation produced by the extra-current spark better than any other. See Trembler.

Screw-die.—See Die.

Screw-driver.—A tool for inserting and withdrawing screws. A very short screw-driver, as well as one about ten inches in length, will prove useful to the automobilist; the smaller one for use with the screws on the carburetter, coil, etc., and the longer one for various purposes aside from that for which the tool is designed, such as grinding in a valve, pressing an exhaust-spring out of the way, while a cotter-pin is being introduced, etc.

Screw, Finger.—The same as Set-screw.

Screw-gear.—A gearing in which the teeth are parts of a screw-thread of long pitch. See Worm-gear.

Screw, Grub.—A small headless set screw is so called when flush with the surface.

Screw, Interrupted.—A screw in which sections of the threads are cut away by longitudinal grooves, and which may be inserted in a hole with corresponding grooves and screwed accurately into place.

Screw-joint.—See Joint, Screw.

Screw, Lag.—A heavy round-shanked screw having usually a square head. Called also a "lag-bolt."

Screw-machine.—A machine usually resembling a lathe in form, and by means of which a succession of screw-threads can be rapidly cut on the ends of bolts, rods, etc. The rod may pass through a hollow mandrel, and the dies be fixed; or the dies may rotate in jaws fixed on the mandrel and be held in a slide-rest. Various tools for cutting and finishing the screw, as well as the screw dies, are fixed in a turret, and can be made to act on the work in succession.

Screw, Machine.—A screw for insertion in a threaded hole in metals, into which it does not force its own way as do wood-screws.

Screw-pitch.—See Pitch.

Screw-plate.—A hard steel plate forming a number of dies for cutting small screws.

Screw-propeller.—See Propeller.

Screw, Set.—A screw used for adjusting some part of a mechanism, or for holding it in place after adjustment.

Screw-sleeve.—A screw cut on the surface of a hollow shaft or sleeve.

Screw, Spindle.—The same as Grub-screw, q. v.



Screw, Sunk.—Same as Countersunk Screw.

Screw-tap.—See Tap.

Screw-thread.—See Screw.

Screw, Thumb.—A screw provided with a milled or winged or flat head, by means of which it can be turned with the fingers.

Screw, Twin.—A vessel fitted with two screw propellers normally turning in opposite directions.

Screw, Typhonoid.—A type of propeller screw invented by Mr. H. Gambin, and consisting of a number of blades symmetrically arranged around an axis and terminating in a cylinder tube. The screw is placed at the bow instead of at the stern of the boat.

Screw, Wood.—A screw having a V-thread of coarse pitch and a point by which it is enabled to penetrate wood.

Scriber.—A sharp-pointed tool used for marking lines on metal or wood.

Scribner, F. P.—Supt. Royal Equipment Co., 165 Housatonic Ave., Bridgeport, Conn.

Scriven's New Garage, C. L.—13 Spring St., Ashtabula, O. (Buick, Cadillac.) Est. 1892. Garage, 20 cars. Repairing.

Scroll-spring.—See Spring, Scroll.

Scudder, F. E.—Sec Northwestern Storage Battery Co., 448 Milwaukee St., Milwaukee, Wis.

Scull, John L.—Partner Scull-Morris Motor Co., 258 N. Broad St., Philadelphia, Pa.

Scull-Morris Motor Co.—258 N. Broad St., Philadelphia, Pa. (Aerocar.) Est. Feb., 1907. John L. Scull and Francis B. Morris, Partners. Repairing.

Scupper.—One of the holes in a vessel's side, at the level of the deck, to let water run off the latter.

Seabrook & Smith Carriage Co.—126 Park St., New Haven, Conn. Mfrs. wood and metallic bodies.

Seabrook Automobile Club.—Seabrook, Tex. Col. C. W. Rutgers, Pres.

Seabury Co., Chas. L.—Morris Heights, New York City. Mfrs. body irons.

Sea Cock.—See Cock, Sea.

Sea-skunk.—A type of small motorboat, 20 feet in length, and of 18 inches draught, designed for cruising and racing.

Seadale, A. H.—1932 Washington Ave., New York City. Garage.

Seagate Automobile Equipment Co.—1218 Bedford Ave., Brooklyn, N. Y. Supplies.

Sea Gate Garage.—Sea Gate, Coney Island, N. Y. Garage.

Seager, Geo. B. M.—Pres. Adrian Steel Casting Co., Beecher St., Adrian, Mich.

Seaman & Merkel.—Fleetwood, Pa. (Rambler, Reo.)

Seaman, Sam'l J., Jr.—Glen St., Glen Falls, N. Y. (Ford.)

Seaman, Wm. A.—Branchport, N. J. Mfr. motorboats.

Seaman's Auto Water Heaters.—448 Niagara St., Buffalo, N. Y. Supplies.

Seamless Tube Co. of America.—Frick Bldg., Pittsburgh, Pa. Mfrs. steel tubing.

Search-light.—A powerful lamp, usually lighted with acetylene or electricity, and the rays of which are concentrated into one beam and projected to a distance by a reflector.

Sears & Burgess.—1229 Michigan Ave., Chicago, Ill. (Pullman Flyer.)

Sears Bros. Co.—750-2 Massachusetts Ave., Indianapolis, Ind. Garage.

Sears-Nattinger Co.—Des Moines, Ia. (Stoddard-Dayton, Ford, Reo, Columbus.)

Seat.—The surface against which a valve rests. (2) The plate upon which a motor-vehicle spring rests.

Seattle Automobile Co.—1423 10th Ave., Seattle, Wash. (Columbia, Locomobile, Franklin.)

Seattle Automobile Association.—Seattle, Wash. M. Mason, Sec.

Seavey Bros.—50 Emerson St., Haverhill, Mass. (Lambert.)

Seavy, Wm. G.—616 Blue Hill Ave., Boston, Mass. Garage.

Sector.—Part of a circle bounded by two radii, and the arc subtended by them.

Sector, Grid.—The same as gridiron-quadrant. See Quadrant.

Sedalia Automobile Club.—M. T. Slane, Sec., 303 Ohio St., St. Louis, Mo.

Segment.—That part of a circle included between an arc and its chord. (2) A gear-wheel, cam, or other machine element the outline of which is the segment of a circle.

Segment-valve.—See Valve, Segment.

Seheu, Ch.—1 Blvd. d'Alsace-Lorraine Le Perreux, Seine, France. Mfr. oil and acetylene lamps.

Schrack, E.—22 Spring St., Rochester, N. Y. Garage.

Seiberling, A. G.—Asst. Gen. Mgr. and Purch. Agt. Apperson Bros. Automobile Co., Kokomo, Ind.

Seiberling, C. W.—Treas. Goodyear Tire & Rubber Co., Akron, O.

Seiberling, Frank A.—Pres. and Gen. Mgr. Goodyear Tire & Rubber Co., Akron, O.

Seibert, Frank A.—Sec. Manhattan Brass Co., 332 E. 28th St., New York City.

Seidemann und Co.—Ritterstrasse 9, Berlin, Germany. Mfrs. storage batteries.

Seidler, B. F.—Pres. Seidler-Miner Electric Co., 207 Jefferson Ave., Detroit, Mich.

Seidler-Miner Auto Co.—244 Jefferson Ave., Detroit, Mich. (Jackson.)

Seidler-Miner Electric Co.—207 Jefferson Ave., Detroit, Mich. Mfrs. spark plugs, battery switches, full line of electrical and ignition supplies. Cap. \$30,000. Est. 1891, Inc. 1903. F. J. Miner, Sec., Treas. and Mgr.; B. F. Seidler, Pres.

Seifert & Co., E. W.—Shelbyville, Ind. (Maxwell, National.)

Seiler Co., The.—Jamestown, N. D. (Cadillac.)

Seitz, C.—207 E. 35th St., New York City. Mfr. tire cases.

Seitz Co., F. A.—141 Frelinghuysen Ave., Newark, N. J. Mfrs. gasoline marine motors, motorboats.

Seizing.—The gripping or binding of a bearing, of the faces of a clutch, or of the piston in the cylinder, owing to heat or insufficient lubrication

Self-contained.—Complete within itself; containing its own actuating mechanism, or all in one frame or on one base.

Self-ignition.—See Ignition, Self.

Self-induction.—See Induction, Self.

Seldon, George B.—Inventor. Born Rochester, N. Y. Ed. Yale. Practiced



law as patent solicitor in Rochester. Patentee of the Seldon gasoline automobile, upon which the Seldon patent was applied for in 1879 and granted in 1895. Is now at the head of the Seldon Motor Vehicle Co. of Rochester, N.

Y., which is marketing a 4-cylinder gasoline car. Res., Rochester, N. Y.

Selden Motor Vehicle Co.—Rochester, N. Y. Makers of the Seldon car. First marketed in July, 1907. Two models. 50 hp., 28 hp. Cap. \$500,000. George B. Selden, Pres.; J. H. Stedman, Treas.; R. H. Salmons, Sec. and Gen. Mgr.; E. T. Birdsall, M. E., Designer.

Selective.—A term applied to a type of sliding-gear-transmission in which the sliding member or members do not pass through the gears in which they are engaged. Thus a change may be made from high to low gear or opposite without passing through the intermediate gears.

Seligman, A. F.—Troy, Ill. (Jewel.)

Seligman, Jefferson.—Banker. B. Nov. 26, 1858. Ed. Columbia Grammar school; Columbia 1878; studied medicine in Germany. Became a member of the banking

firm of J. & W. Seligman & Co. One of the earliest users of automobiles in America. Res., 11 East 69th St., address, 21 Broad St., New York City.

Selleck, John L.—South St. and Union Ave., Peekskill, N. Y. (Rambler, Marion.)

Selma Gun & Key Co.—917 Water St. Selma, Ala. (Wayne, Pope-Hartford, Waltham, Mitchell.) Est. Sept. 1, 1901. W. D. Batton, Gen. Mgr. Garage. 25 cars. Repairing.

Selwynite.—An Australian mineral affording one of the sources of chromium.

Semi-Dry Battery Co., The.—5th and Essex Sts., Harrison, N. J. Mfrs. semi-dry cells and batteries. Cap. \$125,000. Est. 3 years. Jay E. Dunn, Pres. and Mfg. Mgr.; Arthur F. Jackson, Vice-Pres., Gen. Mgr. and Treas.; L. B. Jackson, Sec.

Semmler, C.—58 rue de Paradis, Paris, France. Mfr. radiators.

Sendelbach Wheel Co.—E. St. Louis, Ill. Mfrs. wood wheels.

Seneca Auto Supply Co.—13 Plymouth St., Chicago, Ill. Supplies.

Seneca Iron & Steel Co.—53 Erie Co. Bank Bldg., Buffalo, N. Y. Mfrs. sheet and bar iron and steel.

Senn, E.—31 rue des Tanneurs, Bale, Switzerland. Mfr. speed indicators.

Series, In.—Battery-cells are said to be connected "in series" when the positive and negative poles are alternately



connected; the positive wire running to one side of the switch. Another set of cells similarly wired is attached to the other side of the switch.

The negative poles of both sets are grounded. A series connection is shown in Fig. 1, where each carbon (center) post is connected to the zinc (outside) post of the next cell, leaving the carbon post of one end cell and the zinc post of the other end cell for terminals of the battery.



This results in multiplying the pressure to the aggregate voltage of the cells in the battery but not changing the current strength from that of a single cell. A "multiple-series" connection (Fig. 2), is a combination connection of both series and multiple (see Multiple). It results in increasing the pressure to the voltage of the series-unit and the current to the amperage of the number of units in parallel.

Serize et Cie., E.—6 rue Abel, Paris, France. Mfrs. leather tires.

Serpollet, Leon Emmanuel.—Born at Culoz, Oct. 4th, 1858. Chevalier of the

Legion of Honor. Serpollet was one of



the first partisans of mechanical locomotion upon common roads. From the outset he showed a preference for steam and always remained faithful to it. Establishing himself first at 27 Rue des Cloys in 1899, he took as his associate M. Gardner, and, with him, brought out the well-known

Gardner-Serpollet car. In 1906 he became a partner of M. Darracq in the firm of Darracq & Serpollet, manufacturers of heavy weights.

Service Co., Ltd.—292 High Holborn, London, W. C. England. Mfrs. motorcycles. (Service.)

Service, W. E.—Bridgeton, N. J. Garage.

Sessions Foundry Co.—Bristol, Conn. Mfrs. gray iron castings.

Sessions, J. B.—Bristol, Conn. (Locomotive.)

Set.—A deformation or deflection of an object due to stresses. See Elastic Limit. (2) The inclination of the teeth of a saw at the angle known to be the best to facilitate the exit of the sawdust. (3) A tool for setting saw-teeth. (4) A rivet-set. (5) A form of chisel used in cutting iron bars.

Set-bolt.—See Bolt, Set.

Set, Cup.—See Set, Rivet.

Set-nut.—See Nut, Set.

Set-off.—Same as Offset, q. v.

Set, Rivet.—A punch called also a "snap," with a hollow face for forming second heads on rivets.

Set, Saw.—See Set (3).

Set-screw.—See Screw, Set.

Setzer Co., Chas.—561-63 Pelham Ave., New York City. Garage.

Severson, Geo. W.—Hd. of Sales Dept. Bowen Mfg. Co., Canal St., Auburn, N. Y.

Seward & Son Co., The M.—New Haven, Conn. Mfrs. carriage hardware, spring clips for automobiles and general drop forgings. Cap. \$100,000. Est. 1844. Frank Seward, Pres.; C. E. Prince, Sec. and Treas.; S. C. Reilly, Supt.

Seward, Frank.—Pres. The M. Seward & Son Co., New Haven, Conn.

Sexton, C. A.—Perth Amboy, N. J. (Maxwell.)

Seyler, Wm.—Goodland, Kan. Garage.

Seymour-Benn Co.—104 Jefferson Ave., Brooklyn, N. Y. Garage.

Seymour Mfg. Co.—Seymour, Conn. Mfrs. sheet and rod brass and copper.

Seymour, Walter F.—536 Atwells Ave., Providence, R. I. Garage.

Shackle.—A form of link which connects one end of a spring to the hanger or dumb-iron. See Spring.

Shackle-joint.—See Joint, Shackle.

Shackelford & Lefford Co.—Westboro, Mo. (Jackson.)

Shafer, G. F.—Supt. Modern Tool Co., 4th and State Sts., Erie, Pa.

Shafer, Henry.—436 Lion St., Dunkirk, N. Y. Garage.

Shaffer Carriage Co.—938 N. Illinois St., Indianapolis, Ind. Mfrs. automobile tops, glass wind shields.

Shaffer Machine & Mfg. Co., The.—211 N. Calvert St., Baltimore, Md. Mfrs. fuel and air pumps.

Shaffer, R. G.—203 Bridge St., Phoenixville, Pa. Garage.

Shaft.—An axle, arbor, or other long and usually cylindrical bar arranged for rotating with or carrying a wheel, etc. Shafts are named from some feature of mechanism or the part to which they are attached, or from the function which they perform.

Shaft-block.—A block placed in the stern of a motor-boat and bored for the reception of the propeller-shaft.

Shaft, Cam.—See Cam-shaft.

Shaft, Cardan.—A shaft provided with universal joints at each end.

Shaft, Counter.—See Jack-shaft.

Shaft, Crank.—See Crank-shaft.

Shaft, Cross.—Same as Jack-shaft.

Shaft, Drive.—The same as propeller-shaft, q. v.

Shaft, Flexible.—See Coupling, Flexible.

Shaft, Gear.—A shaft carrying gear-wheels or pinions that mesh with gear or pinion-wheels on another shaft.

Shaft, Half-speed.—The same as Cam-shaft.

Shaft, Half-time.—The same as Cam-shaft.

Shaft, Intermediate.—Any shaft that transmits power from one shaft to another by means of either gears or belts.

Shaft, Jack.—An intermediate shaft, called also a "countershaft" and "cross-shaft," taking power from one shaft and transmitting it to another by means of chains, gearing or belts. In automobile work, it is the shaft which crosses the car and carries sprockets on its outer ends, and is driven by a bevel-gear from the gear-box. This shaft is usually made in two parts, the inner ends being in the differential-gear. It actuates the rear wheels through chains running over sprockets at its outer ends. See Differential gear.

Shaft, Lay.—The shaft used in gas-motors to transmit motion from the main shaft to the valve-gear.

Shaft-log.—A log in the stern of a motor-boat through which the propeller-shaft runs.

Shaft, Motor.—See Crank-shaft.

Shaft, Primary.—The shaft in the gear-case which, receiving power from the motor, transmits it to the secondary shaft.

Shaft, Propeller.—A shaft bearing the propeller or screw in a marine motor. (2) On a motor-car, the shaft that transmits power from the gear-box to the back live axle.

Shaft, Reversing.—A small shaft in the gear-case which carries the reversing gear-wheel.

Shaft, Secondary.—The shaft in the gear-case that transmits power from the primary shaft to either the propeller or jack-shaft, or back to the primary shaft.

Shaft, Square.—In a sliding gear, a shaft of square section, A, on which one or more gear-wheels, R, having the same rotary speed as the shaft may be slidden by a fork so as to bring them into engagement with one or another gear-wheel on a parallel shaft, and thus produce changes of speed. See Gear, Sliding.



Shaft, Torsion.—The shaft that runs through a center of a live axle transmitting the drive from the differential to the road-wheels.

Shaft, Transverse.—A shaft, such as the jack-shaft, set at an angle with another shaft.

Shaft, Two-to-One.—The same as Cam-shaft.

Shailer, F. S.—Chester, Conn. Garage.

Shain, Chas. D.—70 Murray St., New York City Est. 1901. Supply house handling everything in automobile and motorboat supplies. Mfrs. terminals, battery connectors, spark plugs, cables, carburettors, inspection lamps.

Shaler Co., C. A.—Waupun, Wis. (Elmore.) Mfrs. portable vulcanizers, vulcanizing materials. Est. July, 1906. Partnership. Cap. \$150,000.

Shambaugh, Chas.—South Raub, Ind. (Pope-Toledo, Buick, White.)

Shamlaugh Auto Inn, Chas.—Lafayette, Ind. (Cadillac, Pope-Toledo, White.)

Shamokin Novelty Co.—Shamokin, Pa. Garage.

Shanklin, W. J.—Marion, Kan. (Waltham.)

Shanks, Charles Bernard.—Gen. Sales

and Adv. Mgr. Winton Motor Carriage

Co. B. Pennsylvania, March 19, 1873. Director Lake Shore Navigation Co., Eastland Steamship Co. Mem. Century, Clifton, Lakewood Yacht, Dover Bay, Cleveland A. C. Res. Lakewood, O. Office, Berea Road, N. W., Cleveland, O. In



the trade since May 24, 1899. Recreations: Fishing, golf, lawn tennis, etc.

Shannahan & Wriggins Hardware Co.—N. Washington St., Easton, Md. (Rambler.)

Shannon, T. K.—Mgr. Behen-Faught Motor Car Equipment Co., 3961 Olive St., St. Louis, Mo.

Sharman Automobile Co.—109-111 W. S. Temple St., Salt Lake City, Utah. (American Mors, Reo, Moline, National, Woods, Mitchell.)

Sharp, I. H.—Main St., Bernardsville, N. J. Garage.

Sharp, W. H. B.—Indian Head, Sask., Canada. (Holsman.)

Sharp's Garage.—Bakersfield, Cal. (Maxwell.)

Shattuck, Albert Richardson.—Director. B. Cincinnati, O., Jan. 31, 1853. Ed. College of the City of New York. Director British & American Mortgage Co. Ltd., Realty Co. Mem. clubs: Metropolitan, Lotos, Lawyers, Union League, Ardsley, N. Y. Yacht, A. C. A. Res. 19 N.



Washington Sq., Office 11 Broadway, New York City. User of car for about ten years.

Shattuck Co., W. P.—2125 Grand Ave., S. Minneapolis, Minn. Mfrs. transmission gears

Shaver, P. F.—Sales Mgr. Ketchum & Co., Bank and Sparks Sts., Ottawa, Can.

Shaw-Brown Motor Co.—897 Main St., Buffalo, N. Y. Garage.

Shaw, B. W.—Rep. Dept. Park Sq. Auto Station, 43 Columbus Ave., Boston, Mass

Shaw Co., Walden W.—1532-1534 Michigan Ave., Chicago, Ill. (Berliet.) Est. 1906. Walden W. Shaw, Pres.; Bronson C. Buxton, Sec. and Treas. Garage, 20 cars. Repairing.

Shaw Engineering & Mfg. Co.—216 High St., Newark, N. J. Mfrs. jacks.

Shaw, Frank.—260 N. Broad St., Philadelphia, Pa. Vulcanizing.

Shaw, L. B.—Riddlesburg, Pa. (Cadillac.)

Shaw, Louis E.—Chief Engineer Willoughby Appliance Co., Ludlow Station, Yonkers, N. Y.

Shaw Motor Tyre Tread Co.—135 Steelhouse Lane, Birmingham, England. Mfrs. non-skids.

Shaw, Ora D.—109 Kingston St., Boston, Mass. Mfr. wearing apparel, caps.

Shaw, Walden Willard.—Automobile dealer. B. Chicago, Ill., Jan. 12, 1879. Ed. Andover. Director and Pres. Walden W. Shaw Co. Mem. South Shore Country, Calmut, Chicago A. C., A. C. de Nice, Touring Club de France. Res. 174 E. 51st St., Hyde Park, Chicago, Ill.; Office N. E. cor. 21st and Michigan Ave., Chicago, Ill. In the trade since 1906. Used first car (Hanriot) 1901.

Shawmut Motor Co.—1091 Boylston St., Stoneham, Mass. Garage. Mfrs. gasoline automobiles.

Shawmut Tire Co.—97 Bedford St., Bedford, Mass. Mfrs. pneumatic tires.

Shawver Co.—Springfield, O. Mfrs. jacks, tire-pumps, tire tools.

Shean Auto Co.—640 Main St., Springfield, Mass. (Oldsmobile, American Mercedes.)

Shear, T. F.—Vice-Pres. The Spaulding Engine Co., St. Joseph, Mich.

Shear Steel.—See Steel, Shear.

Shearer Auto Co., S. C.—1650 Glenarm St., op. Denver Club, Denver, Colo. (Haynes.)

Shearing.—A transient or continuous stress, through which a piece of mechanism has a chisel-like action upon another piece. Thus, in a motor-car, when two iron plates are secured to each other by rivets, which have a slight play in the holes in which they are inserted, the plates will continually slide upon each other after the manner of the blades of a pair of shears, and eventually cut or "shear" the rivets.

Shearing Stress, or Strain.—A stress resulting from or of a character to produce a strain.

Shears.—A tool for cutting sheet metal, etc., and having an action resembling that of scissors.

Sheave.—A small wheel with a groove on its periphery in which a rope or belt may be run. Specifically, the grooved wheel of a pulley block. See Pulley.

Sheehan's Garage.—12 Stockbridge St., Springfield, Mass. Garage.

Sheer.—The upward curvature of the lines of a vessel toward bow and stern. (2) The position of a boat riding at single anchor with the anchor ahead.

Sheer-line.—The line of the deck at the side of a vessel.

Sheering.—The act of deviating from the line of course, so as to form a crooked or triangular path through the water.

Sheerman, E. D.—Treas. Salisbury Wheel & Mfg. Co., Jamestown, N. Y.

Sheet-metal.—Metal made into sheets by rolling, as sheet brass, sheet iron, etc.

Sheets & Knoble.—De Kalb, Ill. (Pope-Waverley.)

Sheffield Car Co.—Three Rivers, Mich. Mfrs. gasoline commercial automobiles.

Shelby Steel Tube Co.—Pittsburg, Pa. Mfrs. axles, steel tubing.

Sheldon Axle Co.—Wilkesbarre, Pa. Mfrs. springs and axles. Est. 1870. Edw. H. Jones, Pres.; Thos. H. Ather-ton, Vice-Pres.; Chas. H. Guilain, Sec. and Treas.; William H. Son, Supt. spring dept.; J. B. Decker, supt. axle dept.

Sheldon, J. H.—Sales Mgr. Continental Caoutchouc Co., 43 Warren St., 2100 Broadway, New York City.

Shell.—The outer part of various objects, e. g., of a boiler considered apart from its fittings, or of a vessel, apart from the internal work, etc.; a pulley-block case.

Shellac.—A brittle, resinous substance in plates, made from "stick lac," which consists of twigs incrustated with a reddish mammalated resin produced by the puncture of an insect upon the branches of several plants. Shellac treated by chlorine gives "bleached shellac." Shellac is largely used in the manufacture of wood polishes and varnishes. In combination with powdered mica it forms "micanite," q. v. Dissolved in alcohol and with the addition of silver bronze powder it gives the silver paint employed for painting motors.

Shelingsburg, Richard.—Foreman J. E. Lonergan & Co., 211-15 Race St., Philadelphia, Pa.

Shenandoah Auto Garage.—1610 Briar Place, Chicago, Ill. Garage.

Shenango Valley Auto Co.—Sharon, Pa. (Mitchell, Maxwell.)

Shelter Top Co.—1240 N. 1st St., St. Louis, Mo. Mfrs. automobile tops.

Shepard & Sons.—New Haven, Conn. Mfrs. bent seat panels, body stock, frames and bows.

Shepard Co.—Providence, R. I. (Columbia.)

Shepard, Perry.—Purch. Agt. Cassady Fairbank Mfg. Co., 6106-30 LaSalle St., Chicago, Ill.

Shepard, Walter L.—364 Franklin St., Melrose Highlands, Mass. (Winton. Stanley.)

Sheppard, W. S.—22 Lawrence St., Newark, N. J. Mfr. grease, oil, semi-solid oils, automobile body polishes, metal polishes.

Sheppier, H. L.—2nd Asst. Supt. Pope Motor Car Co., Toledo, O.

Sherburne & Co., A. H.—70 Middle St., Lowell, Mass. Garage.

Sheridan Auto Station.—3210 N. Clark St., Chicago, Ill. Garage.

Sherill & Morgan, Drs.—Camp Crook, S. D. (Cadillac, Waltham.)

Sherman-Lemke Coil & Supply Co.—106 Wisconsin St., Milwaukee, Wis. Mfrs. spark plugs, spark coils.

Sherrer, F. A., Dr.—Easton, Pa. (Mitchell.)

Sherwin-Williams Co., The.—601 Canal Road, N. W., Cleveland, O. Mfrs. paints, varnishes, stains and finishing materials for every purpose. Est. 1866. W. J. Sohlinger, Mgr. Carriage and Mfg. Trades Sales Dept. Factories: Chicago, Newark, Montreal, London, England. Sales offices and warehouses in 23 cities.

Sherwood Brass Works.—1167 Jefferson Ave., Detroit, Mich. Mfrs. brass, bronze, aluminum and copper castings.

Sherwood, H.—Mgr. San Francisco, Cal. Branch of Monarch Motor Car Co., 16th and Arnold Sts., Chicago Heights, Ill.

Sherwood Mfg. Co.—Elmwood Ave. and Belt Line, Buffalo, N. Y. Mfrs. carburettors, brass, bronze, aluminum and copper castings, ejectors, grease cups, lubricators, oil cups, oil pumps.

Shetter, A. B.—Middletown, O. (Cadillac.)

Shettler, L. T.—633 S. Grand St., Los Angeles, Cal. (Reo.)

Shettler, Reuben.—Vice-Pres. Reo Motor Car Co., Lansing, Mich.

Shields Carriage Co., The.—Amesbury, Mass. Mfrs. wood and metallic bodies, body irons, automobile tops.

Shiland, H. E.—Sales Mgr. Buick Motor Co., Flint, Mich.

Shillinglaw, H. L.—20 N. 4th St., Grand Forks, N. D. (Mitchell.)

Shim.—A piece of sheet metal of varying thickness, called also a "shim liner" or "distance-washer," designed for filling the space between loose or separated parts, such as a divided bushing, joint, etc.

Shinolser & Co., J. W.—217 3rd St., Macon, Ga. (Franklin, Cadillac.)

Shinn, F. R.—Treas. Okey Motor Car Co., W. Broad and Kimball Sts., Columbus, O.

Shipman, Ralph.—Sunbury, Pa. (Maxwell.)

Shippey Bros.—Cheapside, 13-14 King St., London, England. Garage.

Shippey, Geo. E.—Pittsfield, Mass. Mfr. shock absorbers.

Shiveley, Geo. W.—Sec. Pennsylvania Rubber Co., Jeannette, Pa.

Shoch, Henry R.—Treas. Quaker City Auto Co., 138-146 N. Broad St., Philadelphia, Pa.

Shoch, James R.—Sec. Quaker City Auto Co., 138-146 N. Broad St., Philadelphia, Pa.

Shock.—A sudden stress, whether produced by a blow or otherwise.

Shock-absorbers.—Devices known also as "shock-eliminators," "shock-brakes," "dampers," "anti-bouncers," etc., designed to check the excessive rebound of car-springs after they have been compressed in passing over a road obstruction, and to stop the disagreeable vibration of the vehicle-body and prevent the breakage of the springs. The first and most successful device of this kind was applied to racing cars in France half a dozen years ago. Since then many devices for a similar purpose have been invented and are now in the market. These are of various types and may be divided into the following categories: (1) Friction checks (friction between metal plates and washers); (2), hydraulic checks (glycerine, oil or other liquid contained in a "dash-pot"); (3), pneumatic checks (cylinder in which air is compressed by a piston); (4), and supplementary springs. All are constructed so as to be attached at one end to the spring or rear axle near the middle of the spring, and at the other end to the side of the frame above the axle, in order that the resistance which they offer will act directly between the spring and the frame. One of the best known devices of the first, or friction, category is the Truffault-Hartford shock-absorber (Fig. 1), which, in general form, is like the stop of a trunk-lid.



Fig. 1

The end of one arm is held by a stud on a plate that is bolted to the side of the car-frame, and the small ends of a pair of other arms are attached by a bolt to a plate that is held by the spring-clamps. The other ends of the arms are enlarged into circular friction-plates, the end of the upper arm being placed between the disks of the pair of lower arms. The arms are joined together firmly by a center stud fitted with a hardened steel bushing. Under the nut of the stud on one side is a star-shaped spring-

steel washer, that maintains constant pressure on the friction-plates and compensates for wear. An absorbent friction material is interposed between the faces of the disks, increasing the friction and, at the same time, providing a receptacle for retaining lubricant, enough of which is held in the material to last indefinitely.

This form of shock-absorber is simple, strong, unobtrusive, and durable. It acts in both directions, that is, against the compression and against the rebound of the car-springs, acting as a brake to vibration. The principle and general form of the Hartford shock-absorber have been extensively copied, and a number of devices have been patented and offered for sale during the last two years that differ from it only in detail, such as the mechanical means for developing the friction.

An example of the second category is offered by the Foster shock-brake (Fig. 2). This consists of a small light chamber of cold-drawn steel, with piston or plunger, which is attached to the frame



Fig. 2

and which operates as follows: The lower portion of the cylinder contains oil. The sudden compression of the spring forces the plunger down against the oil, and the plunger head is so constructed that when it comes in contact with the oil in the lower part of the cylinder, it forces it through eight small holes in the valve-disk into the upper chamber; then when the recoil occurs, the oil acts as a cushion and the plunger retards with a slow, steady pull, which prevents the jar and shock always occasioned by a sudden bump. The oil flows back into the lower chamber, a small portion at a time and thus relieves all strain and jar from the spring as well as eliminates all possibilities of a broken spring.

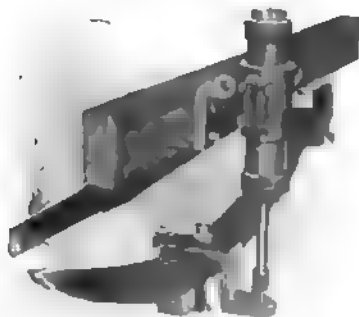


Fig. 3

In Fig. 3 is shown an example of the third, or pneumatic category, the "Perfection Air-cushion." This consists simply of an air-chamber and a piston-rod with a double acting piston-head. The air-chamber can be attached to any part of the body of a vehicle or to the upper half of a full elliptic spring, and the piston-rod to any part of the axle or any fixed point below or to the lower half of the full elliptic spring.

When the car drops into a rut or gutter, in place of its going down with a sudden jolt it is eased down by the air-chamber being forced down on the piston, and when the car comes up out of the rut or gutter or on to an obstruction like a railroad track it is eased up on an air-cushion by the reverse action of the piston in the air-chamber; thus the car gets no jolts, and there is no strain on the car by either the sudden upward or downward stroke, as both movements are completely eased up by the compression in the air-chamber because air is the most elastic substance known to science.

The fourth category, supplementary springs (See Spring, Supplementary), includes all devices that tend to supplement or relieve the work of the leaf-spring in carrying the load, and are usually so placed that the initial weight of the car is carried by them wholly or in part. There are many types of such springs on the market, of which the Rueckert shock-absorber may be mentioned as an example. This is a supplementary spring placed over the car-spring. It consists, as shown in Fig. 4, of two helical springs placed side by side, and provided with common spring blocks for the upper and lower ends of the springs so that they will compress

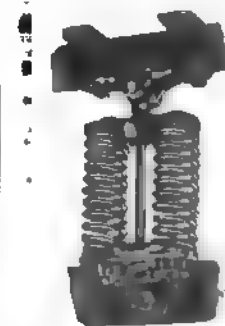


Fig. 4

together and each take its share of the load. A rod fastened to the lower part of the car-spring carries the upper block, and two rods, each passing through one of the springs carry the bottom block. These rods cannot move separately without moving the blocks and thereby compressing the springs.

When an obstacle in the road is encountered which tends to throw the wheels up toward the bottom of the car, the middle rod moves through the upper spring block and carries with it the lower block which compresses the springs and offers a resistance to this sudden jolt. On the recoil, when there is a tendency of the car body to spring too far away

from the wheels, the outer rods passing through the helical springs slide through the upper block and carry with them the lower block, which also compresses the helical springs and offers a resistance to this rebound. It will be seen that the springs, when acting, are always under compression whether the body and axle of the car be approaching each other or whether the distance between them is becoming greater.

Shoe.—A strip fastened to the bottom of a keel as a protection thereto. (2) That part of a brake which presses against the tire of a wheel. (3) The casing which confines the inner tube of a pneumatic tire.

Shoe, Brake.—See Brake-shoe.

Shoe, Tire.—See Shoe (3).

Shoedinger, F. O.—Treas. Direct Drive Axle Co., 575 N. Fourth St., Columbus, O.

Shoemaker Automobile Co.—Freeport, Ill. Makers of the Shoemaker car; first marketed in 1906. Three models made since. Cap. \$250,000. C. C. Shoemaker, Pres., Gen. Mgr. and Pur. Agent; Dr. J. T. White, Vice-Pres.; W. Ernest Johnson, Sec.; H. C. Shoemaker, Designer; Scott Van Etten, Supt.; W. E. Clark, Sales Mgr. Branches: Cincinnati, O. C. J. Wirthlin, Mgr. Denver, Colo., E. L. Shires, Mgr. Des Moines, Ia., W. H. Long, Mgr. Fort Wayne, Ind., Kenneth Larwill, Mgr. Grand Rapids, Mich., J. H. Arbogast, Mgr. Kansas City, Mo., O. G. Sellers, Mgr. Minneapolis, Minn., C. B. Catlin, Mgr. Pittsburgh, Pa., D. B. Sober, Mgr. Saint Paul, Minn., M. L. Feckler, Mgr. Seattle, Wash., R. C. Dahlhjehn, Mgr.

Shoemaker, H. C.—Pres., Gen. Mgr. and Purch. Agt. Shoemaker Automobile Co., Freeport, Ill.

Sholes, C. B.—Sec. Holsman Automobile Co., 662 Monadnock Block, Chicago, Ill.

Shonberg, I.—363 Hudson Ave., Brooklyn, N. Y. Mfr. Babbitt and bronze metals.

Shookman & Son.—Goshen, Ind. (Waltham.)

Shop of Siebert, The.—Toledo, O. Mfrs. gasoline commercial automobiles (on contract only).

Shore & Beach.—Lincoln, Neb. (Glide, Lambert.)

Shore, Frank.—1211 New York Ave., Washington, D. C. Garage.

Short.—Brittleness in metals, especially iron and steel, due to the presence of certain impurities. (2) An abbreviation of short-circuit.

Short & Bros., John J.—2028 Sansom St., Philadelphia, Pa. Garage.

Shoulder.—The boss on the end of a rod or shaft, forming a seat for the point of application of another piece of mechanism.

Shove, John W.—Vice-Pres. American Oil Co., 170-78 S. Water St., Jackson, Mich.

Shreve, E. G.—Atlantic City, N. J. (Waltham.)

Shreveport Auto & Gas Engine Co.—319 Spring St., Shreveport, La. (Pope-Toledo.)

Shrewsbury & Chailiner Tyre Co.—Kay St., Ardwick Green, Manchester, England. Mfrs. solid tires.

Shrive, William.—64 Warburton Ave., Yonkers, N. Y. (Cadillac.)

Shroyer & Co., G. W.—Dayton, O. Garage.

Shuey, M. A.—110 W. Wayne St., South Bend, Ind. (Atlas, Monarch, Ford.)

Shugars, Frank.—Supt. Auburn Auto Co., Auburn, Ind.

Shugart, Geo. E.—Sec. Chicago Tire Club, 81 Michigan Ave., Chicago, Ill.

Shugars, George.—Auburn, Ind. (Maxwell.)

Shugert, G. S.—247 Adams St., Rochester, Pa. (Northern, Rambler, Haynes.) Garage, 8 cars. Repairing.

Shuler & Son, Davis W.—Amsterdam, N. Y. Mfrs. leaf springs.

Shuler, W. P.—1002 Morton St., Baltimore, Md. (Pungs-Finch, Maxwell.)

Shulz, A. C.—Asst. Designer Locomobile Co. of America, Main St., Bridgeport, Conn.

Shuman & Co., A.—Boston, Mass. Mfrs. miscellaneous wearing apparel.

Shunt.—A branch conductor or circuit connected in parallel with another or main circuit between two given points. The current divides itself between the two branches in proportion to their conductivity. A shunt may be used to draw off a portion of the main current for some specific purpose, as in the "shunt dynamo," or merely to reduce the current in a part of the main circuit, as in the case of a galvanometer.

Shurmer, Daniel.—Vice-Pres. Royal Motor Car Co., Gordon Park Blvd. and Lake Shore Tracks, Cleveland, O.

Shurmer, E. D.—Pres. and Gen. Mgr. Royal Motor Car Co., Gordon Park Blvd. and Lake Shore Tracks, Cleveland, O.

Shut.—The line of junction of two pieces of metal united by welding.

Shutter.—A device in some carbureters by means of which the opening through which the air is drawn may be increased or diminished.

Shuttle Armature.—See Armature.

Siamesed.—Joined together, doubled, united; as a siamesed coupling, siamesed ports, etc.

Sibley Journal of Engineering.—Pub. at Ithaca, N. Y.

Sicilia Sportiva.—Pub. at Palermo, Sicily.

Sid Black Auto Co.—630 Walnut St., Cincinnati, O. (Babcock, Lozier, Thomas, Buick, Franklin.) Garage, repairing, supplies, renting.

Siddall, G. B.—Sec. Peerless Motor Car Co., 93rd St. and Quincy Ave., Cleveland, O.

Siddard, Wm. A.—10 Bellevue Ave., Philadelphia, Pa. Mfr. motorcycles.

Side-chains.—See Chain, Side.

Side-joint.—See Joint, Side.

Side-lever.—See Lever, Side.

Side-light.—A lamp at the side of a motor-car, generally placed on each side of the dashboard and used as a reserve in the event of a failure of the headlights, and for city driving.

Side-member.—One of the two longitudinal pieces, called also a "girder," "bar," "rail," "reach-member," etc., which, along with the cross-members, forms the frame of a motor-vehicle.

Side-slip.—See Skidding.

Sider, Société Anonyme des Bandages Souples.—66 rue de la Mission-Marchand, Courbevoie, Seine, France. Mfrs. solid tires.

Sidles Automobile Co., H. E.—13th and P Sts., Lincoln, Neb. (Buick, Cadillac, Woods.)

Sidney Mfg. Co.—5300 Armour Ave., Chicago, Ill. Mfrs. stampings.

Sidow, Chas.—Aberdeen, S. D. Garage.

Siecke und Schultz.—Berlin, S. W., Germany. Mfrs. storage batteries.

Siegfried, J. B.—Cambridge, O. (Jewel.)

Siegel-Cooper Co.—Automobile Supply Dept., 6th Ave., 18th to 19th Sts., New York City. Est. 1896. Handling motorcycles and motorboats, apparel, accessories and supplies. (Griffon motorcycles and Pierce motorboats.) J. B. Greenhut, Pres.; J. C. Tanty, Hd. automobile dept.

Siegle, Feodor.—Schoenebeck am Elbe, Germany. Mfr. gasoline commercial automobiles (Waren trucks).

Siegrist, Jacob.—Supt. Foundry Dept. The Hildreth Mfg. Co., Lansing, Mich.

Siemens und Halske Actiengesellschaft.—94 Markgrafenstrasse, Berlin, Germany. Mfrs. primary batteries, coils.

Siems, Peter.—Summit Ave. and Grotto St., St. Paul, Minn. Garage.

Sier Bath Co.—143 W. 54th St., New York City. Mfrs. metal gear wheels.

Siersaack, G.—95 bvd. du Hainaut, Brussels, Belgium. Mfr. coils.

Siewerdt, Loewen.—Elberfeld, Germany. Mfr. non-skids.

Sigler & Pettenger.—Sutherland Bldg., Santa Maria, Cal. Garage.

Sigler, C. C.—Pres. American Auto Co., Cleveland, O.

Silencer.—Same as Muffler.

Silicate, Wool.—A substance called also "silicate cotton" and "slag wool," used as a lagging. See Wool, Slag.

Silicium, Ferro.—See Ferro-silicium.

Silicon.—An element, sometimes called "silicium," belonging to the same group as carbon in the periodic system. It does not occur native, but, in combination as the oxide, "silica," it is very abundant and of great importance. Common quartz, agate, chalcedony, flint, opal, amethyst, carnelian, sand, etc., are largely composed of this substance. Carborundum, largely used as an abrasive, is a silicide of carbon (CSi). Silica in iron produces effects analogous to those of carbon. If the silica exceeds a very small amount, the iron become brittle and unreliable. See Carborundum, Iron and Sand.

Sill.—One of the two side-bars of a motor-vehicle frame. See Side-member.

Sills-Eddy Mica Co.—Newark, N. J. Mfrs. mica.

Silver.—A white and lustrous metal; harder than gold and softer than copper, and melting at 1835° F. It is the best conductor of heat and electricity known, and is sometimes used for soldering. See Solder, Silver.

Silverberg, F.—Copenhagen, Denmark. Mfr. primary batteries.

Silver Lake House Garage.—Madison, N. H. Garage.

Silverman, Julius.—Officer Royal Battery Co., 108-10 Duane St., New York City.

Simm, Arthur M.—Sec. The London Auto Supply Co., 1229-31 Michigan Ave., Chicago, Ill.

Simm, Jas. C., Jr.—Pres. Treas. and Gen. Mgr. The London Auto Supply Co., 1229-1231 Michigan Ave., Chicago, Ill.

Simmons & Francis.—Flandreau, S. D. (Atlas, Moline.)

Simmons, Burt R.—310 Connolly St., Paris, Ill. (Waltham, Buick, Pope-Toledo.) Est. 1904. Garage, 10 cars; repairing.

Simmons Co., John.—104-110 Centre St., New York City. Mfrs. gasoline tank gauges, brass and copper tubing, safety valves, stampings.

Simmons, H. D.—332 Broadway, New York City. Eastern Buyer Geo. P. Moore Co., Inc.

Simms Mfg. Co., Ltd.—Welbeck Wks., Kimberley Rd., Willesden Lane, Kilburn, London W., England. Mfrs. high and low tension magnetos, automobile and motorcycle motors.

Simon, S. H.—Treas. and Gen. Mgr. The Carlyle Johnson Machine Co., Hartford, Conn.

Simonon, Foundries et Ateliers.—Herstal, Belgium. Mfrs. motorcycles.

Simons, Carl J.—Gen. Mgr. Palace Auto Co., 1408-1410 Walnut St., Kansas City, Mo.

Simons, G. O.—Shelby, O. (Winton.)

Simonson, Wm.—Mineola, L. I., N. Y. (Mitchell.)

Simplex Automobile Co.—614 E. 83d St., New York City. Makers of Simplex cars and motors. First marketed in 1904. Two different models of chassis made since. Herman and Carl Broesel, Mgrs.; Edward Franquist, Supt. and Designer; C. M. Hamilton, Advt. and Sales Mgr.; Palmer & Singer Mfg. Co., 1620-24 Broadway, New York City, Selling Agents. Dealers: Hamilton Auto, Chicago, Ill.; H. T. Kutzhaus, Tonopah, Neb.; Ransom Auto Co., Albany, N. Y.; T. D. Riggs, 10 Clinton St., Hartford, Conn.; Geo. West, Jr., Ballston Spa, N. Y.; Fuller & Thornton, 2028 Sansom St., Philadelphia, Pa.

Simplex Auto Co.—336 N. Broad St., Philadelphia, Pa. (Renault, Panhard, Isotta-Fraschini.)

Simplex Electrical Co.—110 State St., Boston, Mass. Mfrs. high and low tension ignition wires.

Simplex Motor Car Co.—Mishawaka, Ind. Mfrs. gasoline automobiles.

Simplicity Auto Co.—15th St. and Cleveland Pl., Denver, Colo. (Simplicity.)

Simpson & Price.—45 John Dalton St., Manchester, England. Mfrs. wearing apparel; fur coats.

Simpson, A.—24 W. Mound St., Columbus, O. Repairing.

Simpson, J. J.—Carbondale, Pa. Garage.

Simpson, Wm. G.—80 Broadway, Detroit, Mich. Mfr. gasoline commercial automobiles.

Sims & Co., H. W.—Inkster, N. D. (Buick.)

Sims, W. P.—Bisbee, Ariz. (Waltham.)

Sinclair, Chas. W.—Mechanic Parkway Garage Co., Central Park W. and 110th St., New York City.

Sinclair-Scott Co., The.—Baltimore, Md. Mfrs. gasoline automobiles.

Singer Automobile Co.—3939 Olive St., St. Louis, Mo. (Premier.)

Singer Automobile Co.—573 Farwell Ave., Milwaukee, Wis. (Franklin, Maxwell.)

Singer, C. A.—Pres. Palmer & Singer Mfg. Co., 1620-24 Broadway, New York City.

Singer, C. A., Jr.—Sec. Palmer & Singer Mfg. Co., 1620-24 Broadway, New York City.

Singer Co., Ltd.—Coventry, England. Mfrs. motorcycles, gasoline automobiles and tricars. (Singer.)

Single-acting Engine.—An engine, such as the gas and gasoline-motor and a number of high-speed steam-engines, in which the impulse is given to one side of the piston only.

Single-chain Drive.—A type of transmission in which the power is trans-

mitted directly from the motor to the rear axle by means of a single chain.

Single Center Buggy Co.—Evansville, Ind. Mfrs. gasoline automobiles and commercial vehicles.

Sintz, Guy L.—Fulton and Front Sts., Grand Rapids, Mich. Mfr. carburetters, transmission gears, gasoline automobile motors, timers.

Sintz-Wallin Co., The.—285 S. Front St., Grand Rapids, Mich. Mfrs. gray iron castings, gasoline marine motors.

Sioux Falls Auto & Supply Co.—112-14 N. Main Ave., Sioux Falls, S. D. (Jackson, Rambler, Ford.) Est. 1904. Cap. \$10,000. Frank Carey, Pres.; Clyde A. Gates, Sec. and Mgr. Garage, 50 cars. Repairing.

Sinson Garage Co., The.—Sinson, Cal. Directors: William T. Pierce, T. T. McGregory and Leonard E. Wood. Cap. \$10,000. Garage.

Sirdar Rubber Co., Ltd.—Shirland Rd., Paddington, London W., England. Mfrs. pneumatic tires.

Siren.—An apparatus on motor-cars and motor-boats for producing a loud sound as a warning or signal.

Sireno Co., The.—41 Cortlandt St., New York City. Mfrs. automobile and motor-boat horns, electric switches and specialties. Est. Oct. 23, 1907. John Gorden, Sr., Vice-Pres. and Prop., State Trust Co., 4th and Olive Sts., St. Louis, Mo. John Gorden, Jr., Gen. Mgr.

Sitton, Albert.—Fullerton, Cal. (Tourist.)

Sivan & Co., S.—172 Pentonville Rd., London N., England. Mfrs. radiators.

Siver Carriage Co.—52 Cedar St., Oneida, N. Y. (Maxwell, Ford.)

Sizaire et Naudin, Société des Automobiles.—79 rue de Lourme, Paris, France. Mfrs. gasoline automobiles. (Sizaire-Naudin.)

Skat Mfg. Co.—791 Park St., Hartford, Conn. Mfrs. hand soaps.

Skag.—A knee which unites and braces the stern-post and keel of a boat.

Skene & Co., W. J.—325 Water St., Augusta, Me. (Franklin, Elmore.)

Skene, J. W.—88-90 Bates St., Lewiston, Me. Est. 1900. J. W. Skene, Prop. (Rambler, Ford.) Garage, 50 cars; repairing.

Skew.—Oblique; at an angle; twisted to one side.

Skew-gear.—See Gear, Skew.

Skidding.—A movement, called also "side-slip," due to centrifugal force, and which suddenly slews a vehicle out of the desired direction when taking a curve at a speed which is out of proportion to the radius of the curve and to adhesion to the ground. The side-slip takes place so quickly that the driver hardly knows that it has begun before the car is turned

half way around, or is even headed in a direction opposite that in which it was going. In order to avoid skidding, the transition from one curve to another of different curvature should never be made too abruptly, for the attempt to do this has been the real cause of serious accidents that have been ascribed to defects in the steering-gear. The tendency of motor-cars to side-slip can be reduced by so distributing the weight of the vehicle and its contents as to make the swing-radius about the vertical through the center of gravity as small as possible, and it is also of advantage that the weight be symmetrically disposed with regard to it.

Skilhorn, L. G.—Supt. J. E. Lonergan & Co., 211-13 Race St., Philadelphia, Pa.

Skilton, R. J.—Mgr. Quaker City Auto Co., 138-146 N. Broad St., Philadelphia, Pa.

Skin.—The external planking or sheathing of a boat. (2) The hard outer layer of a casting, etc., due to the cooling of the surface more rapidly than that of the interior.

Skinner & Co.—2d St., between Main and Bush Sts., Santa Ana, Cal. (Reo.)

Skinner & Skinner.—1337 Michigan Ave., Chicago, Ill. Mfrs. tire pumps, power-driven tire inflators.

Skinner, J. M.—Pres. Toledo Storage Battery Co., 102 Oliver St., Toledo, O.

Skinner, L. H.—Colorado Springs, Colo. (Indian.)

Skinner, O. M.—Anaheim, Cal. (Reo.)

Slack.—The loose part of a belt (see Idle-side), or of a fixed rope.

Slack, Morris B.—West Chester, Pa. (Ford.)

Slade, W. W.—Sec. and Supt. Globe Optical Co., 403 Washington St., Boston, Mass.

Slag.—The masses of fused and often vitreous or glassy silicates resulting from a large number of metallurgical operations.

Slag-wool.—See Wool, Slag.

Slagle, W. F.—Bloomsburg, Pa. (Holsman.)

Slama Tire Protector Co.—Humboldt, Neb. Mfrs. anti-skid devices, tire chains, tire treads.

Slater & Co., E. J.—78 Holman St., Attleboro, Mass. (Dragon, Jackson.)

Slater & Sons, S.—47 Worth St., New York City. Mfrs. cloth and carpet trimmings.

Slater, S. S.—Vice-Pres. The Crescent Parts Co., 1743 Broadway, New York City.

Slaughter, R. L.—Midland, Tex. (Buick.)

Slavin, Wm.—Suffern, N. Y. (Maxwell.)

Slee, N. Tip.—Mgr. Auto Motor Co., Baltimore, Md.

Sleeve.—A general name for a hollow cylinder or tube into which a rod or shaft is inserted.

Sleeve-coupling.—A hollow cylinder serving to couple temporarily or permanently two shafts of a machine.

Sleeve-joint.—See Joint, Sleeve.

Sleeve-nut.—See Nut, Sleeve.

Sleeve, Screw.—See Screw-sleeve.

Sleeve, Tire.—A device called also a "gaiter," for making a temporary repair to a pneumatic tire, accidentally cut or bruised. It consists of a leather or rubber covering provided with lacings or eyelets like a shoe, and is placed over the damaged part and laced up. It is necessary to partially deflate the tire before lacing on the sleeve, and then to inflate otherwise dirt may creep in between the sleeve and the envelope and enter through the rent, perhaps injuring the inner tube.

A fair substitute for a sleeve, when none is to be had, is a wrapping of electrician's tape.

Sleight, E. H.—Pres., Gen. Mgr., Purch., Sales and Advt. Mgr. Moline Pump Co., Moline, Ill.

Slew.—To swing around out of a direct course; a term used of a motor-vehicle when it slides sideways in making a turn.

Slide.—A general term for a piece of mechanism which has a fully controlled rectilinear motion.

Slide-bars.—The bars that cause the cross-head of a steam-engine to move in a straight line.

Slide-blocks.—The blocks on the end of an engine cross-head which move along the slide-bars.

Slide-rod.—The rod which operates a slide-valve.

Slide-valve.—See Valve, Slide.

Slide-valve Ignition.—See Ignition.

Sliding-contact.—See Timer.

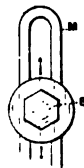
Sliding-feather.—See Feather, Sliding.

Sliding Friction.—See Friction.

Sliding-gear.—See Gear, Sliding.

Slip-joint.—See Joint, Slip.

Slosson, E. P.—1788 Fell St., San Francisco, Cal. (Premier, Crawford.)



Slot.—A general term for a long, narrow cavity, M (see figure), especially a rectangular one, cut to receive some corresponding part, B, in a mechanism.

Slotted Armature.—See Armature.

Slutter & Gamble.—Burlington, Ia. (Maxwell.)

Small, L. P.—Sec., Treas. and Office

Mgr. Consolidated Bicycle & Motor Co., 185 Notre Dame E., Winnipeg, Canada.

Smalley Motor Co., Ltd.—Bay City, Mich. Mfrs. gasoline marine motors.

Smart & Son, Eugene.—459 Central Ave., Dover, N. H. (Stanley.)

Smealie Bros.—10 Division St., Amsterdam, N. Y. (Franklin.)

Smelser, Leslie A.—New Windsor, Md. (Cadillac.)

Smelzer, W. M.—Rockville, Nev. (Waltham.)

Smillie & Co., Harry.—Mill and Market Aves., Rhinebeck, N. Y. Garage.

Smith, A. E.—Treas. Knox Automobile Co., Springfield, Mass.

Smith, A. E.—Sandy Hill, N. Y. (Maxwell.)

Smith, A. I.—213-219 Wisconsin St., Wauwatosa, Wis. (Cameron.)

Smith, A. J.—Gen. Sales Agt., 1228 S. Figueroa St., Los Angeles, Cal. (Elmore.)

Smith, A. L.—Elmira, N. Y. (Studebaker.)

Smith, Alex.—35 Mulberry St., Hartford, Conn. (Indian.)

Smith & Co., Albanus L.—1305 Arch St., Philadelphia, Pa. Mfrs. flexible tubing.

Smith & Co., D. B.—Utica, N. Y. Mfrs. mufflers, muffler cut-out valves.

Smith & Co., Edward.—45 Broadway, New York City. Mfrs. varnishes.

Smith & Co., H. D.—Plantsville, Conn. Mfrs. screwdrivers, hammers and drop forgings. Cap. \$200,000. Est. 1850. L. V. Walkley, Pres.; Louis H. Schmitt, Vice-Pres. and Sec.; Wm. S. Ward, Supt. Geo. R. Bond, Treas.

Smith & Co., Jos. N.—4th and Porter Sts., Detroit, Mich. Mfrs. a general line of automobile mountings, locks, hinges, handles, coat and foot rails, heel-board catches, lamp brackets, moldings, loops, tire holders, prop rests. Cap. \$100,000. Paid up \$51,500. Est. 1875. Inc. 1899. Joseph N. Smith, Pres.; C. E. Chamberlin, Vice-Pres. and Supt.; E. L. Ackerman, Sec. and Treas.; John Streberger, Machine Dept.; N. Bossineau, Polishing Dept.; M. Ryan, Plating Dept.; H. Buehler, Shipping Dept.

Smith & Co., W. Cary.—98 W. Lincoln Ave., Mt. Vernon, N. Y. (Rapid.)

Smith & Co., W. R.—306 W. 52d St., New York City. Repairing.

Smith & Giavannetti.—814 14th St. N. W., Washington, D. C. Garage.

Smith & Hemmingway.—296 Broadway, New York City. Mfrs. jacks, tools, wrenches.

Smith & Jordan.—231 Flatbush Ave., 10 Clinton St.; Charging Station, 811 Union St., Brooklyn, N. Y. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Smith & Sander.—Akron, O. (Premier, Rambler.)

Smith & Son, Ltd., S.—9 Strand, London, England. Mfrs. speed indicators. U. S. Branch, 116 Broad St., New York City.

Smith & Zimmerman.—Raleigh and James Sts., Harrisburg, Pa. Garage.

Smith, Angus.—Sec. and Treas. Olds Motor Works, Lansing, Mich.

Smith, A. O.—Pres. A. O. Smith Co., Park and Clinton Sts., Milwaukee, Wis.

Smith, Arthur Parks.—Sec., Treas. and head of Mfg. Dept., Springfield Metal Body Co., Birney Ave., Springfield, Mass.

Smith, A. R.—809 E. Kearsley St., Flint, Mich. (Buick.)

Smith Auto Co.—61st St. and Broadway, New York City. (Smith.)

Smith Auto Co.—Topeka, Kan. Mfrs. gasoline automobiles.

Smith Auto Co.—1426 Court Pl., Denver, Colo. (Smith, Mora, American, Marvel, Logan.)

Smith Automobile Co.—Kansas City, Mo. (Smith.)

Smith, B. K.—Monticello, Ind. (Waltham.)

Smith Bros.—Los Angeles, Cal. (Rainier.)

Smith Bros.—Essex St., Melrose, Mass. Garage.

Smith, C. A.—Prop. Auto Tire Vulcanizing Co., factory, 689 Lawrence St.; office, Plain St., Lowell, Mass.

Smith Carriage Co., John M.—Atlanta, Ga. (Reo.)

Smith, C. F.—Treas. Logan Construction Co., 2d and Carrol Sts., Chillicothe, Ohio.

Smith, Charles.—Main St., Homer, Ill. Garage.

Smith, Chas. A.—Church Lane and P. & R. Ry., Germantown, Philadelphia, Pa. Mfr. interlocking automobile steering gears, baggage racks, contracting manufacturer of automobile engines, transmission and rear construction parts. Est. 1902.

Smith, Chas. Sydney.—Pres. United Wire & Supply Co., 109-119 Summer St., Providence, R. I.

Smith, Chas. U.—Vice-Pres. and Sec. Central Motor Car Co., Bloomfield, N. J.

Smith, C. K.—New London Auto Station, 94 Main St., New London, Conn.

Smith, Clawson.—420-22 Michigan Ave., Lansing, Mich. (Ford.)

Smith, Clyde H.—Skowhegan, Me. (Cadillac.)

Smith Co., A. O.—Park and Clinton Sts., Milwaukee, Wis. Mfrs. pressed steel frames, steering columns, steering wheels, transmissions, front and rear axles; wheels, control levers, pressed steel dashes, heavy pressed steel work for automobile construction. Mem. M. & A. M. Cap. \$250,000. Est. 1904. A. O. Smith, Pres.; C. G. Forster, Vice-Pres.; Chas. F. Hase, Sec. and Treas.

Smith Co., Ltd., C. H.—Sheffield, Ridgway and Warren, Pa. (Haynes.)

Smith Co., Wm. J.—New Haven, Conn. Mfrs. special automobile machinery.

Smith, C. R.—1230 Fulton St., 200 Bedford Ave., Brooklyn, N. Y. (Frayer-Miller.)

Smith, Crary & Davidge.—174 Water St., Binghamton, N. Y. Mfrs. miscellaneous wearing apparel.

Smith, D. R.—Vice-Pres. and Gen. Mgr. Smith-Haines, 1673 Broadway, New York City.

Smith, Dr. Ephraim.—103 W. Peachtree Ave., Atlanta, Ga. (Mitchell.)

Smith, E. L.—2339 S. Grand Ave., St. Louis, Mo. (Matheson.)

Smith, E. N.—Treas. Adrian Steel Casting Co., Beecher St., Adrian, Mich.

Smith, E. P.—Designer Coppock Motor Car Co., Decatur, Ind.

Smith, F. A. B.—Sec. C. P. Kimball & Co., 315-318 Michigan Ave., Chicago, Ill.

Smith, Frederick L.—Vice-Pres. and Gen. Mgr. Olds Motor Works, Lansing, Mich.

Smith, Fred L.—Treas. Davis Automobile Co., Inc., 7 Dorrance St., Providence, R. I.

Smith, Fred M.—218 2d Ave., Hibbing, Minn. (Rambler.)

Smith, F. N.—Treas. The Garford Co., Elyria, O.

Smith, Fred S.—38 Columbus Ave., Boston, Mass. (Walter, Autocar.)

Smith Garage & Repair Co., Geo.—257 N. Union St., Olean, N. Y. Supplies, garage and repairing.

Smith, G.—Head of Woodworking Dept., Fickling & Co., Inc., 154 E. 57th St., New York City.

Smith, G. Bennet.—Freeport, L. I., N. Y. (Logan.)

Smith, G. C.—Blackhawk, Ind. (Waltham.) Est. 1906. Repairing.

Smith, George E.—Purch. Agt. Reo Motor Car Co., Lansing, Mich.

Smith, G. H.—Mgr. Philadelphia Branch The White Co., 629 N. Broad St., Philadelphia, Pa.

Smith, Gilbert M.—Pres. and Treas. Manhattan Brass Co., 332 E. 28th St., New York City.

Smith, Geo. W.—Newport, R. I. (Maxwell.)

Smith, G. W.—Littleton, N. H. (Buick, Cadillac.)

Smith-Haines.—1673 Broadway, New York City. Est. Dec. 1, 1906. Supply house handling automobile accessories. Fred Ray, Pres.; F. A. Haines, Sec. and Treas.; D. R. Smith, Vice-Pres. and Gen. Mgr.

Smith, Harold O.—Pres. Premier Motor Mfg. Co., Indianapolis, Ind.

Smith, Harry.—Pine Grove, Pa. (Rambler.)

Smith, Henry E.—Treas. United Wire & Supply Co., 109-119 Summer St., Providence, R. I.

Smith, Henry H.—Pres. National Wheel Co., Jackson, Mich.

Smith, Henry T.—Gen. Mgr. United Wire & Supply Co., 109-119 Summer St., Providence, R. I.

Smith, Herbert W.—Treas. and Mgr. Solderene Co., 53 State St., Boston, Mass.

Smith, H. H.—Purch. Agt. The Turner Brass Works, Sycamore and Illinois Sts., Chicago, Ill.

Smith, Hinsdale.—Pres. and head of Design and Detail Dept., Springfield Metal Body Co., Birney Ave., Springfield, Mass.

Smith, H. S.—Supt. Crescent Auto & Machine Co., cor. E. 2d and Marr Sts., Fond-du-Lac, Wis.

Smith Improved Lock Nut Co.—Rockford, Ill. Mfrs. lock nuts and washers.

Smith, J. A.—Saratoga Springs, N. Y. (Thomas Flyer.)

Smith, John E.—Easton, Pa. (Maxwell.)

Smith, Jos. N.—Pres. Jos. N. Smith & Co., 4th and Porter Sts., Detroit, Mich.

Smith, L.—West Point, Ia. (Cartercar.)

Smith, L. H.—Gardner, Mass. Garage.

Smith, L. R.—Advt. Dept., The Automobile, Flatiron Bldg., New York City.

Smith Machine Co.—Van Rensselaer St., Cohoes, N. Y. (Maxwell.)

Smith Machine Co., H.—51 Godwin St., Paterson, N. J. Mfrs. trunk racks, turn tables.

Smith, M. F.—Pittsburg, Pa. (Walter.)

Smith Mfg. Co., The R. H.—Springfield, Mass. Mfrs. name plates, speedometers, steel stamps and stencils. R. H. Smith, Prop.

Smith, N. J. & F. C.—Ridgewood, N. J. (Maxwell.)

Smith, P.—West Plains, Mo. Garage.

Smith, Parfrey & Co., Ltd.—Rannoch St., Fulham Palace Rd., Hammersmith, London, England. Mfrs. wood wheels, springs.

Smith, S. A. & C. A.—Brattleboro, Vt. (Premier.)

Smith Steel Castings Co., Geo. H.—500 Clinton St., Milwaukee, Wis. Mfrs. steel castings.

Smith Storage Battery Co.—198 State St., Binghamton, N. Y. Mfrs. storage batteries.

Smith, T. E.—Treas. The Corbin Screw Corp., New Britain, Conn.

Smith, T. Guilford.—203 Ellicott Sq., Buffalo, N. Y. Mfr. sheet and bar iron and steel.

Smith, Vinal W.—Sec. T. Alton Be-

mus Co., Inc., 358 Atlantic Ave., Boston, Mass.

Smith, W. E.—Dalhart, Tex. (Wal-tham.)

Smith, Wm.—2395 Boulevard, Jersey City, N. J. (Logan, Reo, Premier, Ford, Wayne, Rapid.)

Smith, Wm. H.—Gen. Mgr. John R. Keim Mills, Kensington Ave. and Erie Tracks, Buffalo, N. Y.

Smith, Wm. A.—Associate Editor of Automobile Topics and member staff of International Motor Cyclopaedia.

Smith, W. U.—Vice-Pres. Bellefontaine Automobile Co., Bellefontaine, O.

Smith's Agency & Auto Garage.—Earlville, Ill. (Cadillac.)

Smith's Auto Garage.—83 Main St., Westerly, R. I. Garage.

Smith's Sons, H.—Manteno, Ill. (Cadillac.)

Smooth-on Mfg. Co.—572 Communipaw Ave., Jersey City, N. J. Mfrs. gaskets, packing, iron cement.

Smythe, F. W.—7th and H Sts., Eureka, Cal. Garage.

Smythe, Robert.—Rock Island, Ill. (Maxwell.)

Smythe, W.—Supt. of Shop Lakdel Automobile Co., 5143 Delmar Blvd., St. Louis, Mo.

Snap.—See Rivet-set.

Snap-cam.—See Cam, Snap.

Snap-spark.—See Ignition.

Snapping.—See Popping.

Snifting-valve.—See Valve, Snifting.

Snips.—Shears for cutting zinc, tinplate, etc.

Snodeal Auto Co., George R.—2552 Madison Ave., Baltimore, Md. (Marmion.)

Snow & Co., N. H.—Binghamton, N. Y. Mfrs. automobile tops.

Snow & Petreli Mfg. Co., The.—New Haven, Conn. Mfrs. reverse marine gears.

Snow Automobile Co.—86 Dorrance St., Providence, R. I. (Stevens-Duryea.) Est. 1903. Cap. \$10,000. C. D. Snow, Pres. and Mgr.; W. H. Draper, Treas.; W. A. Rayner, Sec.

Snow, B. W.—132 Bissell St., Syracuse, N. Y. Mfr. mufflers, stampings.

Snow, C. D.—Mgr. Snow Automobile Co., 86 Dorrance St., Providence, R. I.

Snow, E. L.—Brook St., Newton, Mass. Garage.

Snow Hardware Co.—36 Union St., Rockville, Conn. (Buick, Cadillac.)

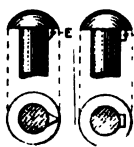
Snow, John L.—Vice-Pres. and Treas. Peerless Motor Car Co. of N. E., 178 Columbus Ave., Boston, Mass.

Snow, Norlan.—Sec. and Treas. Campbell Auto Co., 612 Mulberry St., Des Moines, Ia.; 508 Central Ave., Fort Dodge, Ia.

Snowden, John W.—Peekskill, N. Y. (Winton.)

Snowden, W. T.—786 Bedford Ave., Brooklyn, N. Y. Vulvanizing.

Snug.—A projection, flange, lug, pin, or like device serving to limit the motion of a piece or as a catch for transmitting motion. The snug E of a bolt (see figure) is usually fixed in the body near the head



and enters a recess in the piece in which the head rests and thus prevents the bolt from turning.

Snug-bolt.—See Bolt, Snug.

Snutzel Frères.—9 rue de l'Activité, Brussels, Belgium. Mfrs. bodies.

Snyder & Co.—20 Railroad Pl., E. Orange, N. J., and Orange, N. J. Garage.

Snyder & Kerr.—Attica, Ind. (Jackson, Reo, Wayne, Overland.)

Snyder, A. H.—Sec. and Treas Buffalo Gasolene Motor Co., 1280-90 Niagara St., Buffalo, N. Y.

Snyder Auto Cycle Co.—York, Pa. (Pullman.)

Snyder Automobile Co.—229 W. Market St., York, Pa. (Baker, Pope-Toledo, White.)

Snyder, Clark.—Mill St., Rhinebeck, N. Y. Garage.

Snyder, C. O.—Sec. Chelsea Auto Storage Co., 516-520 W. 37th St., New York City.

Snyder, O.—57 Broad St., Bethlehem, Pa. (Chadwick, Logan, Pierce Racine.)

Snyder, Robt. J.—Bethlehem, Pa. (Holsman.)

Soapstone.—See Steatite.

Soapsuds.—Used as a lubricant for the cutting tools employed in working wrought iron and steel. A good soap mixture for this purpose is made by pouring 1 pint of oil into 5 pounds of soft soap and 12 quarts of water and thoroughly blending the whole by stirring.

Societa Aeronautica Italiana.—(Italian Aero Club), Milan, Italy. Member F. A. I.

Societa Anonima Carrozzeria Locati e Torressa.—Barriera di Nizza, Turin, Italy. Mfrs. bodies.

Societa Anonima Carrazzeria Torinese, Rossi Russolotti.—Barriera Bornigheri, Turin, Italy. Mfrs. bodies.

Societa Anonima di Automobili Serpollet.—Milan, Italy. Mfrs. steam commercial automobiles. (Serpollet trucks.)

Societa Carrozzeria Automobili.—Alesio, Turin, Italy. Mfrs. bodies.

Societa Cierano Automobili Torino.—66 via Madama Christina, Turin, Italy. Mfrs. gasolene automobiles. (S. C. A. T. cars.)

Societa Fidis.—Rome, Italy. Mfrs. gasolene automobiles. (Italian Brasier cars.)

Societa Italiana Roma.—Rome, Italy. Mfrs. gasolene commercial automobiles.

Societa Italiana Siemens.—337 Corso Umberto, Rome, Italy. Mfrs. electric automobiles. (Siemens cars.)

Societa Italo-Svizzera di Costruzioni Meccaniche.—Bologna, Italy. Mfrs. gasoline automobiles.

Societa Luigi Bellona e Ca.—1 Via Sirtori, Milan, Italy. Mfrs. bodies.

Societa Milanese Industria Meccaniche.—San Cristoforo, Milan, Italy. Mfrs. gasoline automobiles.

Société Americain des Carburateurs Volcan.—Boulogne-sur-Seine, France. Mfrs. carburetters.

Société Anonyme de la Roue a Jante Flexible Lambert.—3 Place Daumesnil, Paris, France. Mfrs. elastic wheels.

Société Anonyme de Marcinelle et Couillet.—Couillet, Belgium. Mfrs. gasoline commercial automobiles.

Société Anonyme des Ateliers de Construction, Forges et Fonderies d'Hautmont.—Hautmont, Nord, France. Mfrs. pressed steel frames.

Société Anonyme des Automobiles et d'Electricité Mors.—48 rue du Theatre, Paris, France. Mfrs. automatic starters, low tension magnetos.

Société Anonyme des Automobiles Ruhl.—Dison, Verviers, Belgium. Mfrs. gasoline automobiles. (Ruhl cars.)

Société Anonyme des Brevets et Moteurs Létombe.—59 rue d'Amsterdam, Paris, France. Mfrs. automobile motors.

Société Anonyme des Caoutchoucs de Saint Denis.—1 rue Henri-Murger, St. Denis, France. Mfrs. solid tires.

Société Anonyme des Etablissements Coudert.—Mignot, Puy-de-Dome, France. Mfrs. elastic wheels.

Société Anonyme des Radiateurs Egloff.—Zürich, Switzerland. Mfrs. radiators.

Société Anonyme des Tubes et Chassis Cloisonnés.—225 rue du Vieux Pont-de-Sevres, Billancourt, France. Mfrs. tubular frames, metallic rims.

Société Anonyme d'Inventions Automobiles.—41 rue St. Ferdinand, Paris, France. Mfrs. shock absorbers.

Société Anonyme Electromotion.—54 Ave. Montaigne, Paris, France. Mfrs. electric automobiles. (S. A. E. cars.)

Société Anonyme La Mécanique de Precision.—Charleroi, Belgium. Mfrs. high tension magnetos.

Société Anonyme L'Acétylithe.—61 bvd. du Hainaut, Brussels, Belgium. Mfrs. acetylene lamps.

Société Anonyme l'Auto-Carrosserie.—Rue de Sans-Nom, Gand, Belgium. Mfrs. bodies.

Société Anonyme Le Carbone.—12 rue de Lorraine, Levallois, France. Mfrs. primary batteries.

Société Anonyme le Centaure.—208 Cours Gambetta, Lyons, France. Mfrs.

automatic starters, pneumatic tires, leather tires.

Société Anonyme L'Électrique.—116 rue de Gravel, Levallois-Perret, France. Mfrs. electric automobiles. (Gallia cars.)

Société Anonyme Muller-Vogel et Cie.—St. Aubin, Neufchatel, Switzerland. Mfrs. automobile motors.

Société d'Automobile Designers.—15 rue de Rome, Paris, France.

Société de Construction Automobile de Reims.—Witry-lez-Reims, France. Mfrs. gasoline commercial vehicles. (S. C. A. R. cars.)

Société de Constructions Mécaniques de la Loire.—Chemin du Rez, St. Étienne, France. Mfrs. motorcycles.

Société de Fabrication de Bandages Demountables.—23 bvd. Gouvion St. Cyr, Paris, France. Mfrs. solid tires.

Société d'Antiderapant, Le Bayard.—56 rue de la Roquette, Paris, France. Mfrs. non-skids.

Société de la Pompe Vadam.—366 rue St. Honoré, Paris, France. Mfrs. tire pumps.

Société d'Electricité Nilmelior.—47 rue Lacordaire, Paris, France. Mfrs. primary batteries, spark plugs.

Société de Publications Automobile.—Pub. at 27 rue Ballu, Paris, France.

Société des Jantes Amovils, M. L.—52 Ave. Daumesnil, Paris, France. Mfrs. detachable rims.

Société des Moteurs Gnome.—Petit-Gennevilliers, Seine, France. Mfrs. automobile motors.

Société des Rous a Jante Creuse et Flexible, L. F.—50 bvd. de la Villette, Paris, France. Mfrs. elastic wheels.

Société des Usines des Ressorts du Nord.—10 rue St. Vaast, Douai, France. Mfrs. springs.

Société d'Étude et d'Exploitation pour l'Industrie Automobile.—45 bvd. Haussmann, Paris, France. Mfrs. detachable rims.

Société du Carburateur Malzieux.—61 bvd. de Strasbourg, Paris, France. Mfrs. carburetters.

Société Électrique Hydra.—60 bvd. Clichy, Paris, France. Mfrs. primary batteries.

Société Française de la Roue, E. L.—26 rue de Sablonville, Neuilly-sur-Seine, France. Mfrs. elastic wheels.

Société Française de Petit Outillage.—71 bvd. National, Clichy, Seine, France. Mfrs. ball bearings.

Société Française des Jantes Amoviles Bonhivers.—128 rue du Bois, Levallois, Seine, France. Mfrs. detachable rims.

Société Française des Roulements a Billes.—70 rue Franklin, Ivry-Port, Seine, France. Mfrs. ball bearings.

Société Française de Travaux Métal-

liques.—Hautmont, Nord, France. Mfrs. pressed steel frames.

Société Indo-Chinoise, Industrielle.—20 rue Richer, Paris, France. Mfrs. primary batteries.

Société Industrielle d'Albert.—27 Ave. de la Grande Armée, Paris, France. Mfrs. Rochet motorcycles.

Société Industrielle des Téléphones.—25 rue du Quatre-Septembre, Paris, France. Mfr. pneumatic rubber tires.

Société Internationale des Electriciens, Bulletin of.—Pub. at Paris, France.

Société la Française.—11 rue Brunel, Paris, France. Mfrs. motorcycles, chains.

Société Levitas.—128 rue du Bois, Levallois, France. Mfrs. primary batteries, electric lamps.

Société L'Oléo.—38 rue de la Folie-Regnault, Paris, France. Mfrs. spark plugs.

Société Manufacturière d'Accessoires.—94 rue d'Angoulême, Paris, France. Mfrs. horns.

Société Neuchateloise d'Automobiles.—Boudry, Prés Neuchatel, Switzerland. Mfrs. gasoline automobiles (F. Henriod-Schweitzer cars), automobile motors.

Société Parisienne.—10 Ave. de la Grande Armée, Paris, France. Mfrs. gauges.

Société Suisse de Carrosserie en Automobiles.—26 rue de la Coulouvrenière. Mfrs. bodies.

Société Westinghouse.—45 rue de l'Arcade, Paris, France. Mfrs. shock absorbers.

Society of Automobile Engineers.—42 East Ave., Rochester, N. Y. E. T. Birdsell, Sec.

Socket.—A cavity adapted for receiving and holding a correspondingly shaped piece.

Socket-joint.—See Joint, Socket.

Socket, Reducing.—A coupling for connecting pipes of different diameters.

Socket-wrench.—See Wrench, Socket.

Soedertelge - Werkstaeder.—Soedertelge, Sweden. Mfrs. gasoline automobiles.

Soft Brass.—See Brass.

Soft Iron.—See Iron, Soft.

Soft Solder.—See Solder, Soft.

Sohlinger, W. J.—Mgr. Carriage & Mfg. Trades and Sales Dept., The Sherwin-Williams Co., 601 Canal Rd. N. W. Cleveland, O.

Sohnner, J. W.—Ironton, O. (Ford.)

Solder, Aluminum.—A solder which can be used for both aluminum and aluminum, and made by melting together tin, cadmium and zinc of each 10 parts, and lead 1 part. The pieces to be united should, after being thoroughly cleaned, be immersed for about two hours in a strong solution of hydrosulphate of soda.

Solder, Brazing.—An extra-hard sol-

der for brazing is composed of 3 parts of copper and 1 part of zinc; a hard solder, of 8 parts of brass and 1 of zinc; and a soft solder, of 6 parts of brass, 1 part of tin and 1 of zinc. See Brazing.

Solder, Hard.—A solder that requires a red heat to fuse it. Hard solders are employed for joining brass, iron and the more refractory metals. A good solder for brass is composed of two parts of brass and one part of tin, with the addition, sometimes, of a little lead; but when the solder must be very strong, as for brass tubes that are to undergo drawing, two-third of a part of zinc to 2 parts of brass are employed. A common solder for iron, copper and brass consists of nearly equal parts of copper and zinc.

Solder, Silver.—Solder generally employed for very fine work. Hard silver solder is composed of 1 part of copper and 4 parts of silver; and soft silver solder of 1 part of brass and 2 parts of silver.

Solder, Soft.—A solder composed of 2 parts lead and 1 part of tin, an alloy which has a low melting point and is easily worked with a soldering-iron.

Solderene Co.—53 State St., Boston, Mass. Mfrs. soldering stick and paste, flux stick and flux paste, aluminum soldering sticks. Cap. \$50,000. Herbert W. Smith, Treas. and Mgr.

Soldering.—The operation of joining the surfaces of two metals, such as tin plate, copper, zinc, lead, and their alloys by the interposition of an alloy, which must necessarily be more fusible than the metals to be united. The efficiency of soldering depends upon the intimate union of the surface of the metal operated upon with the alloy used as a solder. To effect this, the surfaces are carefully cleaned, and in most cases a flux is used during the operation, say rosin or a solution of zinc chloride in soft soldering, or borax in hard soldering. The flux assists in removing oxide, etc., from the metal while in the heated state. A suitable quantity of solder is applied to the joint, and fused by the application of a heated soldering-iron or the flame of a blow-pipe. As the joint becomes hot, the solder melts and runs, under the action of surface tension, along the portions which have been prepared and heated to the proper temperature. "Soft solder" is easily caused to follow the track of the soldering-iron as it is drawn along the joint; but "hard solder," which always requires the heat of a blow-pipe, is more difficult to manipulate, and the surfaces to be soldered require very careful preparation.

Soldering, Autogenous.—A method of soldering metals, so called by its invent-

or, M. de Richemont, because it is done by the fusion of the two edges of the metals themselves without interposing a metallic alloy as a bond of union. This is effected by directing upon the two surfaces to be soldered or welded together a flame furnished by a hydrogen-oxygen, an acetylene-oxygen, an illuminating-gas-oxygen, or a hydrogen-atmospheric air blowpipe. The metals thus joined are much less apt to crack asunder at the point of union by difference of temperature, flexure, etc., than when ordinary soldering is employed. The process is cleanly and can be carried out without special training or experience. It is now employed on a large scale for the soldering of various metals, such as iron, copper, nickel and aluminum.

Soldering Fluxes.—Some of the fluxes used for soldering are as follows: For tin-plate, zinc chloride or resin; for copper to iron, resin; for iron or steel, borax or sal ammoniac; for iron to zinc, zinc chloride; for copper or brass, zinc chloride or sal-ammoniac; for lead, mutton suet; for galvanized iron, resin or mutton suet.

Soldering Iron.—A tool whereby solder is melted and applied in the ordinary method of soldering. The "iron," so called, really consists of a block of copper called a "copper bit," at the end of an iron rod provided with a wooden handle.

Soldering Lamp.—A blow-torch in which gasoline is used as a fuel and which is very essential to complete the outfit of an automobile, for the repair of leaks, where the soldering-iron is used.

Solenoid.—A copper wire rolled helically. Ampere's solenoid consists in the uniting of small and closed circuits placed perpendicularly on the same line. It has been discovered by experiment that solenoids possess the same properties as magnets. A solenoid is frequently called an "electrodynamic cylinder."

Solheim's Launch Works.—Great Kills, Staten Island, N. Y. Mfrs. motorboats.

Solid with.—A phrase sometimes used in the sense of "integral with," and sometimes in that of "operatively connected with."

Solliday & Co.—4th and Prairie Sts., Milwaukee, Wis. (Wayne.)

Solos Motoren Gesellschaft.—Gottleutstrasse 94, Frankfort-am-Main, Germany. Mfrs. automobile motors.

Somerville Auto Co.—Bonton Ave. and Broadway, Somerville, Mass. (Rambler, Maxwell.)

Sommer Motor Co.—152 Congress St. E., Detroit, Mich. Mfrs. gasoline automobiles.

Son, William H.—Supt. Spring Dept., Sheldon Axle Co., Wilkesbarre, Pa.

Sontag, F. A.—Houston, Tex. (Thomas.)

Soot.—A black deposit of carbon that often forms in the interior of the cylinder walls of an internal combustion motor and also fouls the spark-plugs when the mixture is too rich for complete combustion.

Sorensen, S.—208 Paterson St., Paterson, N. J. Vulcanizing.

Sorg, S. J.—Pres. Miami Cycle & Mfg. Co., Grand Ave., Middletown, O.

Sorge und Sabeck.—Mauerstrasse 86, Berlin, Germany. Mfrs. carburetters, chains, goggles.

Sotomayor.—19 bvd. Bourdon, Paris, France. Mfrs. tricarcs (La Libellule).

Soules Welch Motor Car Co.—736 Woodward Ave., Detroit, Mich. (Welch, Soules, Baker.)

South Automobile Co.—105 S. Conception St., Mobile, Ala. (Pierce-Arrow.)

South Bend Automobile Club.—Horace E. Kizer, Sec. South Bend, Ind.

South British Trading Co., Ltd.—15 Wilson St., Finsbury, London, E. C., England. Mfrs. motorcycles (Vindec.)

South Broad Automobile Co.—729 South Broad St., Philadelphia, Pa. Mfrs. automobile tops, bodies. Garage, repairing, renting, electric charging, repairing (Dorris).

South Chester Tube Co.—Chester, Pa. Mfrs. wrought iron and steel pipe.

South End Automobile Co.—7 Wright St., Newark, N. J. (Walter.)

South Haven Auto Co.—South Haven, Mich. (Franklin, Thomas, Babcock, Elmore.)

South Park Auto Station.—312-16 E. 57th St., Chicago, Ill. Garage.

South Side Auto Co.—2339 S. Grand Ave., St. Louis, Mo. (Corbin, Mathe-son.)

South Side Auto Repository.—769 44th St., Chicago, Ill. Garage.

South Side Auto Station.—323 E. 35th St., Chicago, Ill. Garage.

South Side Steel & Malleable Casting Co.—Windlake and 14th Aves., Milwaukee, Wis. Mfrs. malleable iron castings.

South Tacoma Garage Co.—South Tacoma, Wash. P. Leonard, Mgr. Garage.

Southern Auto Co.—College St., Asheville, N. C. (Rambler, Ford.)

Southern Automobile Co.—1200 Mt. Royal Ave., Baltimore, Md. (Pierce-Arrow.) Est. 1905. D. A. Clark, Mgr. Repairing.

Southern Auto Co., Ltd.—930 Common St., New Orleans, La. (Rambler, Ford, Premier, Leader.)

Southern Auto Equipment Co.—Atlanta, Ga. Garage.

Southern Automobile & Cycle Club.—

Chas. Procasky, Sec. and Treas., Belleville, Ill.

Southern Automobile Co.—Mobile, Ala. (Wayne.)

Southern Automobile Co.—168 N. College St., Nashville, Tenn. (Buick, Cadillac, Oldsmobile, Stanley, Pope-Toledo, Pope-Hartford, White.)

Southern California Glove Co., Inc.—860 S. Los Angeles St., Los Angeles, Cal. Mfrs. wearing apparel, gloves and gauntlets.

Southern California Motor Car Co.—1811 S. Main St., Los Angeles, Cal. (American, Marion)

Southern Garage Co.—35-37 W. Mound St., Columbus, O. (Buick.) Est. June 17, 1907. Partnership: S. E. Hodge, C. R. Clough. Garage, 40 cars. Repairing.

Southwestern Automobile Co.—W. Adams St., Phoenix, Ariz. (Rambler)

Southworth, A. G.—Automobile Dealer B. La Cross, Wis., Feb. 3, 1870. Ed. high school, Holley, New York, class 1887; Brockport State Normal School, class 1890. Director, Treas. and Mgr. A. G. Southworth Co., Inc. Mem. clubs: Crescent Athletic. Union League, Montauk, L. I. A. C. Res. 389 Park Place, Brooklyn, N. Y. Office. 1733 Broadway, New York City. In the trade since 1898. Used first car (Trimoto) 1898. Recreations: Trap shooting, automobilism, billiards, golf.

Southworth Co., Inc., A. G.—1733 Broadway, New York City, and 342 Flatbush Ave., Brooklyn, N. Y. (Pope-Toledo, Pope-Hartford, Pope-Waverley.) Est. Nov. 1906. Cap. \$100,000. John W. Sutton, Pres.; A. G. Southworth, Treas. and Mgr. Repairing.

Souvestre, Pierre.—1 Rue Tardieu, Paris. B. at Kervat, Finistère, June 1, 1874. Officer of the Academy; Chevalier of the Mérite Agricole; officer of the Nichamltikar; licentiate of law; and editor of "Auto," of "Armes et Sports," "Lois et Sports" and of several political journals. Author of "Histoire de l'Automobile."



Soverhill, H. A.—Vice-Pres. Moline Auto Co. East Moline, Ill

Spacke Mach. Co., The F. W.—Indianapolis, Ind. Mfrs. air compressors, connecting rods, transmission gears, piston rings, sprockets, tire pumps.

Spalding, A. G.—Pres. A. G. Spalding & Bros., 29 W. 42nd St., New York City.

Spalding & Bros., A. G.—29 W. 42nd St., New York City. Garage, 144 W 50th

St. (Stevens-Duryea) Est. 1899. A. G. Spalding, Pres.; J. W. Spalding, Vice-Pres.; W. T. Brown, Treas.; Frank Eveland, Mgr. Garage, 60 cars. Repairing. Branch, 336 N. Broad St., Philadelphia, Pa. F. Winsor Eveland, Mgr.

Spalding Bros.—Abilene, Tex. (Queen.)

Spalding, C. G.—Treas. The F. E. Bowers Co. Inc., New Haven, Conn.

Spalding Cotton Mills.—Griffin, Ga. (Maxwell.)

Spalding, E. B.—Sec. The F. E. Bowers Co., Inc., New Haven, Conn.

Spalding, J. W.—Vice-Pres. A. G. Spalding & Bros., 29 W. 42nd St., New York City.

Spalding, W. E.—Sec. and Treas. Lawrence Motor Car Co., 13-17 W. Warren St., Lawrence, Kan.

Spalin, J. C.—Lyons, Ia. (Waltham.)

Spang, Chalfant & Co.—Pittsburg, Pa. Mfrs. wrought iron and steel pipe, steel tubing.

Spanier, C.—Sec. Geen Electrical Mfg. Co., 180 Lake St., Chicago, Ill.

Spanner.—A non-adjustable wrench used for turning nuts. The nut fits into a short slot, usually formed by two jaws open at one end.

Spanner, Box.—A non-adjustable form of wrench provided with a special socket to fit corresponding nuts.

Spanner, Plug.—A tool used for removing caps, such as those that cover the inlet and exhaust valves.

Spare Motor Wheel of America, Ltd., The.—Sales Dept., 234-6 Michigan Ave., Chicago, Ill. New York Sales Office, 2148 Broadway. Mfrs. spare wheels.

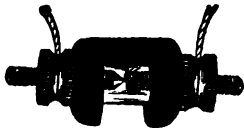
Spark.—A form of disruptive discharge between two conductors. In automobile usage, it is the "spark" that fires the explosive mixture in the motor. The spark is either "a jump spark" or "make-and-break." The first jumps between two electrodes fixed on a spark-plug, and necessitates a current of high tension (up to 5,000 volts), produced in the secondary winding of an induction-coil or a magneto. The second is drawn out between the hammer and anvil of an "igniter," and is a low-tension one (say of 80 volts).

Spark Advance.—Such an advance or "lead" given to the time of firing the charge in a gas-motor as shall cause the spark to occur before the piston has completed its compression stroke. Such advance should be so much the greater in proportion as the piston is moving with greater speed, since the combustion is never instantaneous, but always requires an appreciable time for its production.

Spark-coil.—See Coil. Spark.

Spark, Fat.—A term used to describe a short and thick electric spark due to intensity of the current that produces it.

Spark-gap.—The distance between the points of the spark-plug, say about 1-32 of an inch, through which the spark jumps. After long use, corrosion due to



heat increases such distance, and the points of the plug should then be bent together. (2) A device (see

figure) introduced into the secondary circuit of a spark-coil in such a position that it may be placed on the dash in full view of the driver, and show whether or not the spark is occurring.

Spark-gap, Safety.—In a high-tension magneto, a safety gap (French, "parafoudre") placed in the circuit to prevent the machine from being subjected to too high currents, when, for any reason, the connection between it and the spark-plug is interrupted while the machine is in motion. See Magneto.

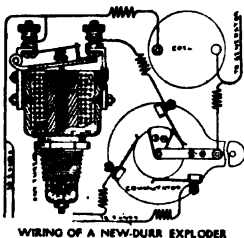
Spark Intensifier.—The same as Spark-gap, q. v

Spark-lever.—See Lever. Spark.

Spark Plug.—In an electric ignition, a plug provided with electrodes between which the spark jumps, and threaded at the end so that it can be screwed into the cylinder wall of a gas-motor with the electrodes projecting inside. It usually consists of porcelain, lava, steatite, tightly rolled mica, or of other heat-resisting materials. The gap between the electrodes is generally 1-32 inch, or slightly more.



Spark-plug, Magnetic.—A magnetic make-and-break device consisting of a circular magnet having an armature pivoted to one end, and which is raised by a spring and depressed by the current passing through the magnet-coil.



WIRING OF A NEW-DURR EXPLORER

Such depression brings the sparking-pin into contact and closes the electric circuit through the spark-coil. At the proper moment the commutator breaks the circuit through the magnet, and releases the armature, which, under the action of the spring, flies upward, knocking the pin out of contact, and produces a hot make-and-break spark at the point of the pin within the explosion-chamber.

Sparks Machine Co., C. F.—Alton, Ill. Mfrs. gasoline marine motors.

Sparks, O. W.—Vice-Pres. Galena Auto & Garage Co., cor. 9th and Main Sts., Galena, Kan.

Sparks, Wm.—Sec. and Treas. Geo. A. McKell Co., Jackson, Mich.

Spartansburg Automobile Co.—Spartansburg, S. C. Garage.

Spaulding, E. G.—Sec. John R. Keim Mills Inc., Kensington Ave. and Erie Tracks, Buffalo, N. Y.

Spaulding Engine Co., The.—St. Joseph, Mich. Mfrs. gasoline marine engines, reversible propeller wheels. Cap. \$25,000. Est. 1903. W. H. Hull, Pres.; T. F. Shear, Vice-Pres.; L. H. Rice, Sec.; Treas. and Gen. Mgr.

Spaulding, H. B.—Treas. John R. Keim Mills Inc., Kensington Ave. and Erie Tracks, Buffalo, N. Y.

Spaulding, S. S.—Vice-Pres. John R. Keim Mills Inc., Kensington Ave. and Erie Tracks, Buffalo, N. Y.

Speakman & Bousall.—105 Main St., Coatesville, Pa. Garage.

Speakman Supply & Pipe Co.—Wilmington, Del. Mfrs. brass pipe fittings.

Spear, C. A.—Oakfield, N. Y. (Walsham.) Est. 1906.

Spear, C. H.—Treas. and Gen. Mgr. Spear Martin Fur Co., 41 Church St., Burlington, Vt. Mfrs., dealers and jobbers, fur automobile coats, robes, caps, gloves, leather caps and gloves. Geo. P. Martin, Pres.; C. H. Spear, Treas. and Gen. Mgr.

Spear Martin Fur Co.—41 Church St., Burlington, Vt. Mfrs. fur automobile coats, robes, caps, gloves, leather caps and gloves. Geo. P. Martin, Pres.; C. H. Spear, Treas. and Gen. Mgr.

Speare, E. Ray.—Treas. and Gen. Mgr. The Alden Speare's Sons & Co., 369 Atlantic Ave., Boston, Mass.

Speare, Lewis R.—Pres. The Alden Speare's Sons & Co., 369 Atlantic Ave., Boston, Mass.

Speare's Sons & Co., The Alden.—369 Atlantic Ave., Boston, Mass. Mfrs. automobile oils, greases, soaps and metal polishes. Est. 1851, inc. 1898. Lewis R. Speare, Pres.; Henry I. Hall, Vice-Pres.; E. Ray Speare, Treas. and Gen. Mgr.; W. D. Stockbridge, Asst. Treas.; Clarence E. Stowe, Automobile Dept.

Special Motor Vehicle Co.—225 E. 4th St., Cincinnati, O. (Ford.)

Specialty Mfg. Co.—South Norwalk, Conn. Mfrs. electric switches.

Speed.—The space traversed by a body during a unit of time, or the ratio of the spaces traversed to the time taken to traverse them.

In the C. G. S. system the unit of speed is the centimetre per second.

When a body is impelled by a uniformly varied motion, the term "acceleration"

during a given time is applied to the ratio of the difference between the speeds at the beginning and the end, and the time considered, or, rather, the ratio between the variation of speed during the time and such time. The unit of acceleration is the centimetre per second per second. In practical units the metre per second is employed for speed, and in the traction of vehicles, kilometres per hour, whether it is a question of railway trains, street cars or automobiles.

"Commercial speed" is the ratio of the distance to be made to the time taken to make it, including in such time stoppages, slowing down, etc.

Speed is really the quotient of a length divided by a time, a definition that is extremely easy to comprehend. If there were 100 miles to be covered, and it took five hours to cover them, the speed would be 20 miles per hour. The speed here is therefore the quotient (100 divided by 5) of the length that had to be traveled (100 miles) by the time (5 hours) that it took to travel it.

It will be seen that the idea of speed must always include that of time.

Acquired speed is the speed of a movable body at the instant that the force moving it is abolished. According to the principle of inertia, the speed would afterward have to remain constant. In practice, the external resistant forces, progressively diminish it, and finally annul it by acting, after a manner, upon the movable body in such a way as to communicate a negative acceleration to it.

The term "acquired speed" is frequently used to designate the "live power" of a body in motion.

Speed, Angular.—The number of units of angular measurement through which an object turns in unit of time. Thus, if a wheel makes n revolutions per second, the angular speed is $360n$ degrees per second, or $2\pi n$ radians per second. See Radian.

Speed-indicator.—A device for indicating the speed of a vehicle or machine, actuated by gearing or other device from one of the moving parts. Those for automobiles are actuated from one of the steering wheels, and those for machines by a spindle or shaft. Different makers give different names to their product, as "speedometer," "tachometer," "tempometer," etc. Speed indicators for cars are graduated in miles or kilometres per hour, while those for machines (turbines, etc.) are graduated in revolutions per minute. See Motor-meter, Speed-indicator, Speedometer and Tachometer.

Speed, Linear.—The velocity or speed with which a body moves along a path whether straight or curved, as distinguished from angular velocity.

Speed, Piston.—The linear speed at which a piston reciprocates within a cylinder, equal to the stroke multiplied by twice the number of revolutions within a given period.

Speed-regulation.—See Governing.

Speedometer.—An apparatus to show the speed at which a motor-car is running.

Speed Changing Pulley Co.—750 E. Washington St., Indianapolis, Ind. Mfrs. carburettors, clutches, gasoline automobile motors.

Speedway Garage.—414 W. 155th St., New York City. Est. July 1, 1907. H. Ephraim and S. Silverburg, Proprietors. Garage, 50 cars. Repairing.

Speers, M. H.—Pine Bluff, Ark. (Thomas Flyer.)

Spelter.—An alloy of copper and zinc, in equal proportions for hard spelter, and of 1 part of tin, 4 parts of copper, and 3 of zinc for soft. It is used for brazing. (2) A commercial name for zinc.

Spence, E.—Sec. and Treas. Spence Mfg. Co., 279 Park St., Milwaukee, Wis.

Spence, J. H.—Pres. Spence Mfg. Co., 279 Park St., Milwaukee, Wis.

Spence Mfg. Co.—279 Park St., Milwaukee, Wis. Mfrs. oil cups, grease cups, brass water fittings, brass castings. Cap. \$25,000. Est. 1900. J. H. Spence, Pres.; E. Spence, Sec. and Treas.

Spencer & Parker.—121 E. Milwaukee St., Janesville, Wis. (Jackson.)

Spencer Bros.—Charleroi, Pa. Garage.

Spencer, C. H.—Phenix, R. I. (Waltham.) Est. 1906.

Spencer, C. W.—Special Representative R. M. Owen & Co., Lansing, Mich.

Spencer, Edwin C.—4 Mantic Ave., Providence, R. I. Garage.

Spencer, H. B.—Vice-Pres. Universal Electric Storage Battery Co., Offices 108 La Salle St., Factory, 36-38 Union Park Pl., Chicago, Ill.

Spencer, H. L.—5 N. Main St., Pawtucket, R. I. Garage.

Spencer Motor Co.—316 N. Broad St., Philadelphia, Pa. (Jackson.)

Spencer Optical Mfg. Co.—15 Maiden Lane, New York City. Mfrs. eye shields.

Spencer Regulator Co.—5-7 Front St., Salem, Mass. Supplies.

Spencer, Thos.—Hd. of Experimental and Originating depts., Helios Mfg. Co., Bridesburg, Philadelphia, Pa.

Spencer's Sons, I. S.—Guilford, Conn. Mfrs. brass, bronze, aluminum and copper castings, gray iron castings.

Sperry, Ira B.—Sec. The Auto Shop Co., 731 Vincent Ave. N. E., Cleveland, O.

Sperry, Wilbur.—Myrtle St., Leroy, N. Y. (Maxwell.) Garage.

Spewing-machine.—See Tubing-machine.

Spicer, C. W.—Pres. Spicer Universal

Joint Mfg. Co., 3rd St. and Madison Ave., Plainfield, N. J.

Spicer Universal Joint Mfg. Co.—3rd St. and Madison Ave., Plainfield, N. J. Mfrs. universal joints, high-tension magnetos. Member M. & A. M. Cap. \$100,000. Est. 1903. C. W. Spicer, Pres.; D. E. Titsworth, Vice-Pres.; Asa F. Randolph, Sec. and Treas.

Spider.—A skeleton of radiating spokes.

(2) The internal frame of a wheel, a gear-wheel or steering wheel (see figure, which shows the spider of a steering wheel), for example, on which a rim may be bolted, shrunk or cast. (3) The solid internal part of a piston to which the packing is attached and to the axis of which the piston-rod is attached. (4) A cross-shaped piece, on the ends of which are mounted wheels or bearings, as in the differential gear, for example.

Spider.—An open car, without top, provided in front with a single seat for two, and at the rear a seat reserved exclusively for a servant. This rear seat, carried by a wooden or iron frame, is usually detachable, and can be replaced by a trunk or case or a second seat similar to the first, in which event it is converted into a double-phaeton.

Spiegel.—A pig iron or white cast iron containing 3.5 to 6 per cent. of carbon and from 10 to 12 per cent. of manganese. If the manganese is much in excess of the latter amount, the name "ferro-manganese" (q. v.) is applied to the alloy. See Ferro-manganese.

Spigot-nut.—See Nut, Spigot.

Spindle.—The tapering end of a vehicle axle on which the wheels revolve. (2) A stationary shaft on which a pulley or wheel is mounted. Some spindles, such as those of magneto armatures, are revolvable. (3) The rod or stem of a valve.

Spindle-screw.—The same as Grub-screw. q. v.

Spindle-valve.—See Valve, Spindle.

Spinks, Lewis.—Treas. Standard Motor Construction Co., 180 Whiton St., Jersey City, N. J.

Spinney, H. I.—Farmington, Me. (Stanley.)

Spinning.—The formation of objects of a circular section, such as signal-horns, for example, from thin sheets of metal in a lathe. The sheet metal is placed in front of a mould attached to the mandrel and pressed by a suitable tool into the mould as it revolves.

Spinning, F. M.—1310 2nd Ave., Seattle, Wash. (Indian.)

Spiral Nut Lock Co.—432 E. 71st St., New York City. Mfrs. lock nuts and washers.

Spiral Spring.—See Spring, Spiral.

Spiral Spring & Auto Co.—1709 Broadway, New York City. Mfrs. supplementary spiral springs.

Spirits, Killed.—See Killed Spirits.

Spirits of Salts.—See Acid, Hydrochloric.

Splash-board.—Another name for fender and mud-guard, q. v.

Splash Lubrication.—See Lubrication.

Splatt, Wall & Co.—Perth, Australia. (Monarch.)

Spline.—A rectangular key fitted into a seat on a shaft, and occupying a groove in a hub, which slides longitudinally upon it, and rotates with it; a feather. (2) The slot to receive a feather. See Feather. (3) A thin strip of wood used as an aid in the drawing of curves through a number of points.

Splittorf, Chas. F.—261-5 Walton Ave., New York City. Mfr. spark coils, magnetos, commutators, spark plugs, switches. Member M. & A. M. Est. 1858. Chas. F. Splittorf, Prop. and Gen. Mgr.; John M. Splittorf, Mgr.

Splittorf, Chas. F.—Prop. and Gen. Mgr. Chas. F. Splittorf, 261-5 Walton Ave., New York City.

Splittorf, John M.—Mgr. Chas. F. Splittorf, 261-5 Walton Ave., New York City.

Spoerer's Sons.—400 S. Tremont Ave., Baltimore, Md. Vulcanizing.

Spoke.—One of the radial arms which connect the hub of a wheel with the rim. Spokes are of two kinds, tension and compression. The first are usually made of steel wire held in the hub by a shoulder and drawn tight in the rim by a nipple. The second are of wood and consist of the following parts: (1) a "foot," (2) a "tongue" or "tenon," which is inserted in the felloe; and (3) the "throat," or contracted part of the body near the hub. In motor-cars the wheels generally used are of the artillery type, in which the spokes lie in the same plane with the center of the hub; but sometimes the spokes are "staggered" (see Staggered), in order to provide against the lateral strains to which the wheel may be subjected. In suspension wheels the spokes are always staggered, since the lateral stiffness of a wire tension spoke is not adequate to maintain the wheel always in the same plane. In some cases where the wooden or compression spokes do not lie in the same plane as the periphery of the wheel, the latter is "dished" (see Dish), and in such a case the wheel is always "dipped" (see Dip), the amount of the dip being always such as to compensate for the dish. This arrangement is generally adopted for heavy vehicles,



but is little employed for motor-cars.
(2) One of the handles on the exterior of the rim of the steering-wheel of a boat.

Spoke, Compression.—See Spoke.

Spoke, Tangent.—A metal spoke which leaves the hub at a tangent to its rim instead of radially.

Spoke, Tension.—See Spoke.

Spoke, Tubular.—A hollow spoke, having externally the solid appearance of that of an artillery wheel. Wheels provided with such spokes are very light and strong and are much used for light cars and voituresses.

Sponge.—A porous sponge-like form assumed by finely divided metals, such as platinum and iron. See Platinum, Spongy. (2) A mass of iron from the puddling furnace not yet hammered into a homogeneous mass. (3) The network of elastic fibers that remains after the removal of the living matter from a ceratose sponge. Used for washing and cleaning motor cars, etc.

Sponge-cloth.—A cloth of loose texture used in place of cotton-waste for wiping oil off machinery.

Spontaneous Combustion.—See Combustion, Spontaneous.

Spool.—A socket-piece on the shaft of a cone-clutch between the transmission and universal joint.

Spooner, Frank Edward.—Photographer, Spooner & Wells, Inc. B. Batavia,



Photo by Spooner & Wells

Ill., Jan. 6, 1870. Ed. Lakeview High-school, Lakeview, Ill., finished first year. Publicity promoter Geo. N. Pierce Co., Adv. Mgr. Automobile Dept. A. W. Erickson Advt. Agency. Former automobile editor N. Y. Globe and special writer on automobile topics for different papers. Bicycle rider in 1878 and long-distance champion (amateur) in 1888; started nine times in long distance races and was never beaten. Became cycle correspondent in 1888 and represented over ninety papers, until 1901, when he entered the automobile field.

Sport, Le.—Pub. at 22 rue de la Braie, Brussels, Belgium.

Sport Universel Illustré, Le.—Pub. at 13 rue de Londres, Paris, France.

Sports, Les Modernes.—Pub. at 24 Blvd. des Capucines, Paris, France.

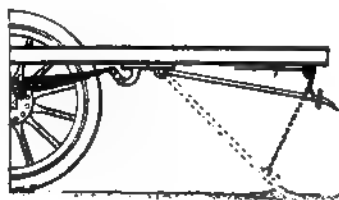
Sports, Ltd.—2049 Broadway, New York City. Est. May 1st, 1907. Supply house handling automobile supplies, motorcycles and sporting goods. Palen Nel-

son, Pres.; W. B. Hughes, Sec.; John G. Bogan, Mgr. and Treas.

Sportsman, Le.—Pub. at 14 rue d'Or-Brussels, Belgium.

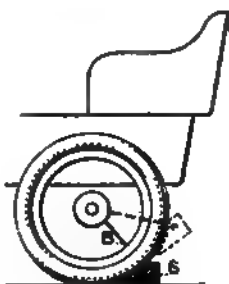
Sports, Les.—Pub. at 20 rue Saint-Marc, Paris, France.

Sprag.—A device, called also a "drop-brake" and "devil," generally consisting of a pointed rod fixed to the rear of a



vehicle and that penetrates the ground and prevents the vehicle from backing down a hill when the brakes fail to work.

Sprag, Block.—A ground-brake consisting of strong rods, B (see figure), to which are pivoted wedge-shaped blocks, S, and which, when released, drop and involve in their fall that of the blocks, which chock the road - wheels



when the vehicle begins to back.

Sprag, Ratchet.—A ratchet-wheel secured to a live axle, and into the teeth of which a pawl drops when the vehicle reverses its motion. An arrangement for preventing a vehicle from backing down hill. See Ratchet-wheel.

Sprague Bros.—113 5th Ave., Lorain, O. (Richmond.)

Sprague Electric Co.—527 W. 34th St., New York City. Mfrs. electric generators and motors.

Sprague Co., F. H.—Orange, Mass. Mfrs. miscellaneous wearing apparel.

Sprague, Col. Jas. H.—Pres. Sprague Umbrella Co., Norwalk, O.

Sprague Umbrella Co.—Norwalk, O. Mfrs. automobile tops and fronts. Member M. & A. M. Cap. \$40,000. Surplus, \$250,000. Est. 1879. Col. Jas. H. Sprague, Pres.; H. B. Conklin, Sec. and Treas.; A. E. Day, Supt.

Sprankle, W. Judson.—Reo Motor Car Co. of Philadelphia, 242 N. Broad St., Philadelphia, Pa. (Hotchkiss, Reo, Premier.) Est. 1906. Repairing.

Spratley, H. C.—Asst. Gen. Mgr. and Hd. Dept. of Equipments, Palmer and Singer Mfg. Co., 1620-24 Broadway, New York City.

Spray Carburetter.—See Carburetter.

Spray-deflector.—See Deflector, Spray.

Spray-hood.—See Hood, Spray.

Spring.—A piece of elastic material (tempered steel, hard brass, rubber, etc.) generally in the form of a thin rod or ribbon, employed to exert a force in a definite direction when bent or otherwise distorted.

Spring-buffer.—A cushioning device designed to prevent the bouncing action of the springs of a car when passing over inequalities of the road. See Shock-absorber.

Spring-clamp.—See Clamp, Spring.

Spring-clip.—See Jack.

Spring-clutch.—See Clutch, Spring.

Spring, Combination.—A spring in which the dumb-iron attached to the frame takes the place of the upper part of the ellipse.

Spring Commutator.—A small spring which holds together the arms of a commutator.



Spring, Conical.—A spring, called also a "cone spring," produced by winding a strip of metal on the surface of a cone, often used in buffers, etc.

Spring-cotter.—See Cotter, Spring.

Spring, Elliptic.—See Springs, Motor-car.



Spring, Equalizing.—A conical spring used to modify the action of the main spring of a motor-vehicle or to assist in carrying the load.

Spring, Grass-hopper.—A half-elliptic spring with linking plates for attachment to a shackle.

Spring-hangers.—The extreme ends (in some cases actual extensions of) a motor-car frame, usually provided with eyes to which the ends of the springs are attached.

Called also "dumb irons" and "frame hangers." Some forms of spring-hangers are of pressed steel construction, but the usual forms are hand or drop-forgings. The front, or what is generally termed the "pump-handle" form of hanger, is shown in Fig. 1, and the rear, or "fish-hook" form, in Fig. 2.

Spring, Helical.—A spring, sometimes called a "compression spring" and "ex-



tension spring," according as the spirals or open or close, made of a steel strip or wire wound into cylindrical form; often improperly called a spiral spring.

Spring-horn.—See Horn, Spring and Dumb-iron.

Spring-jack.—See Jack.

Spring, Leaf.—See Spring, Carriage.

Spring-pad.—Same as Spring-saddle.

Spring, Piston.—See Piston-spring.

Spring, Plate.—See Spring, Carriage.

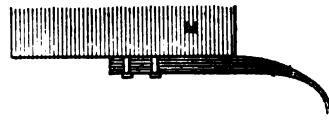
Spring, Platform.—A spring consisting of two longitudinal half-elliptic springs, each shackled at one end of the body of the vehicle and at the other to the two ends of an inverted elliptic spring, placed transversely and secured at the center to the vehicle body.

Spring, Reach.—A spring connecting the front and rear axles.

Spring-ring.—The same as piston-ring.

Spring-saddle.—The "seat" upon which a spring rests.

Spring, Scroll.—A half-spring, C (see figure), that takes the place of the dumb-



iron and, shackled to a half-elliptic, forms a three-quarter elliptic spring.



Spring-seat.—A plate, called also a "pad" or "saddle," through which a spring rests upon the axle of a motor-vehicle.

Spring, Side.—A type of leaf-spring usually placed at the side of a motor-car.



Spring, Spira.—A spring coiled in one plane, like the spring of a watch. The term is also often erroneously applied to a helical spring, q. v.

Spring, Twin.—A double half-elliptic spring so shackled that only half the



spring comes into play on good roads or under light loads, while both halves come into play on bad roads, or under heavy loads.

Spring, Valve.—See Valve-spring.



Spring, Volute.—A flat metallic spring coiled in conical form and compressible in the direction of its axis; sometimes used in the running gear of heavy commercial motor vehicles.

Spring Washer.—See Washer, Spring.

Spring, X.—A plate-spring like the letter X.

Springs, Motor-Car.—The object of car-springs is to absorb the vibrations and joltings caused by the passing of the wheels over the inequalities of the road. They should be flexible and as long as



Fig. 1.

possible, since the stiffness of a spring varies inversely with its length. They are constructed of several finely tempered curved steel plates called "leaves," so shaped and combined as to strengthen each other and, at the same time, permit of each of them successively bearing its proper share of the load as the deflection of the spring increases. Springs are made in a variety of shapes, such as the "half-elliptic" (Fig. 1), "full elliptic" (Fig. 2), "three-quarter elliptic" (Fig. 3), "C," etc. Of these, the first is the type most commonly used on automobiles. While the full elliptic, which is more used on light cars and horse-drawn car-

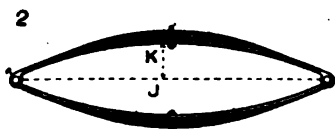


Fig. 2

riages, has always been regarded as a serviceable spring, it does not possess the rigidity sidewise that is secured by the half-elliptic. The full elliptic necessitates the use of radius-rods to maintain the axle in position, but the half-elliptic is usually attached to the frame at one end while the other end is connected by a shackle to the spring-horn and is secured to the axle by means of clips. The three-quarter elliptic is similar to the half-elliptic, except that a scroll spring takes the place of the spring-horn.



Fig. 3

The deflection of a spring is the height, JK (Fig. 2), which separates a horizontal line extending from the two points of suspension of the spring from the upper part of the latter most distant from the

said line. The deflection ought never to exceed one-tenth of the length of the spring. That it may be elastic and, at the same time, strong, a spring should possess numerous wide and not very thick leaves, and have as slight a deflection as possible; and the top of the leaves should be of a general parabolic form. The tapering of the ends and thickness of the leaves should be calculated with the greatest care.

Spring Perch Co.—232 John St., Bridgeport, Conn. Mfrs. automobile and carriage springs (to order), curtain rollers for limousines, etc. Est. 1843. Edward Sterling, Pres.; Edw. W. Marsh, Sec.; F. B. Hawley, Treas. and Mgr.

Springer & Eastrold.—Mayville, N. Dak. (Ford.)

Springfield Auto Co.—40 Liberty St., Springfield, Mass. (Locomobile, Franklin, Stevens-Duryea.) Garage.

Springfield Auto Top & Upholstering Co.—102-6 Dwight St., Springfield, Mass. Mfrs. bow separators, cushions, automobile tops.

Springfield Automobile Club.—R. M. Baker, Sec., Springfield, Ill.

Springfield Auto Mfg. Co.—Springfield, Ill. Garage.

Springfield Automobile Club.—G. E. Mentel, Sec., Springfield, O.

Springfield Hat & Cap Co.—27-35 Taylor St., Springfield, Mass. Mfrs. wearing apparel, caps.

Springfield Machine Tool Co., The.—Southern Ave., Springfield, O. Mfrs. turret, high speed and brass working lathes, shapers, bench straightening presses. Cap. \$50,000. Surplus, \$200,000. Est. 1887. P. E. Montanus, Pres.; Paul A. Montanus, Gen. Mgr. and Vice-Pres.; Edw. I. Montanus, Sec.

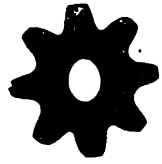
Springfield Metal Body Co.—Birney Ave., Springfield, Mass. Mfrs. aluminum bodies, hoods and fenders, automobile tops. Member M. & A. M. Est. 1902. Hinsdale Smith, Pres. and Hd. Design and Detail Dept.; Arthur Parks Smith, Sec. and Treas., Hd. Mfg. Dept.; Wm. T. Helfer, Sales Mgr.; F. B. Read, Hd. Automobile Top Dept.

Springfield Portable Const. Co.—Springfield, Mass. Mfrs. portable houses and garages.

Springsteen, Edward M.—Hd. of Sales Dept. The Auto Shop Co., 731 Vincent Ave., Cleveland, O.

Sprinting.—A momentary acceleration of speed of the motor beyond the normal, causing the car to jump ahead in a race, either at the finish or in order to pass a competitor; a racing of the motor in order to make faster time.

Sprocket.—A toothed wheel that drives or is driven by a chain. In a double-



chain-drive, a small toothed-wheel attached to each end of the jack-shaft and driving the road-wheels through chains which pass over larger sprockets forming part of the hub. In a single-chain drive, a toothed wheel placed on the transmission-shaft and driving, by a chain, a larger sprocket surrounding the differential-case on the rear axles.

Sprue.—See Gate.

Spun-cotton.—See Cotton, Spun.

Spur-gear.—See Gear, Spur.

Spurling, H. G. W.—Hamilton, Bermuda. (Rapid.)

Spyker, Usines.—Trompenburg, Amsterdam, Holland. Mfrs. gasoline automobiles (Spyker cars).

Square.—A projection on top of the plug of a cock made square to fit the square recess in the key that turns it.

Square Shaft.—See Shaft, Square.

Squat.—To sink somewhat at the stern when in rapid motion; said of a vessel.

Squeak.—A distinctive noise due to a dry bearing, or other part that needs oiling. If such "squeak" comes from a bearing, the latter should receive prompt attention, otherwise it may become abnormally hot and seize.

Squier, G. C.—141 Mass. Ave., Boston, Mass. (Premier.)

Squires, E. G.—Ottawa and Pearl Sts., Grand Rapids, Mich. (Gearless, Michigan.)

Squires, F. H.—Head of Motors and Automobile Dept., Albaugh Bros., Dover & Co., Marshall Blvd. and 21st St., Chicago, Ill.

Squires, H. G.—Southampton, N. Y. Garage.

Squires, H. L.—Morgan City, La. (Waltham.)

Staacke Bros.—133 W. Commerce St., San Antonio, Tex. (Buick, Haynes, Stevens-Duryea.)

Stackpole Battery Co.—St. Mary's, Pa. Mfrs. dry cells, carbons, patent connectors, testing instruments, voltmeters, ammeters. Cap. \$100,000. Est. June, 1907. Mem. M. & A. M. J. K. P. Hall, Pres.; B. E. Wellendorf, Vice-Pres.; H. C. Stackpole, Treas.; W. J. Mills, Mgr.; G. W. Mills, Asst. Sales Mgr.

Stackpole, H. C.—Treas. Stackpole Battery Co., St. Mary's, Pa.

Stadleman, Geo. M.—Sec. and Sales Mgr. Goodyear Tire & Rubber Co., Akron, O.

Stafford Co., N.—67 Fulton St., New York City. Mfrs. license numbers, monograms, name plates.

Stagg, Stephen.—1308 W. Broad St., Richmond, Va. (Holsman, Maxwell.)

Staggered.—An arrangement of a num-

ber of objects, so that they are not exactly in a line with each other, or so that they incline alternately to the right or left.

Stahl, T. Raymond.—Advt. Mgr. Racine Boat Mfg. Co., Riverside, Muskegon, Mich.

Stale.—Said of gasoline when its density has reached such a point as to interfere with its free evaporation and render it less inflammable.

Stall & Dean Mfg. Co.—Brockton, Mass. Mfrs. automobile robes, wearing apparel, caps.

Stambaugh, John.—Pres. The Carlyle Johnson Machine Co., Youngstown, O.

Stamford Motor Co., The.—Stamford, Conn. Mfrs. gasoline automobile motors, motor-boats.

Stamp, Jacon C.—1327 Market St., Wheeling, W. Va. (Winton.)

Stamped Steel Engine Mfg. Co.—475 E. 105th St., Cleveland, O. Garage.

Stamping.—The operation of producing objects of metal by means of dies actuated by a press or stamping machine. Some metals may be used in the cold, while others require heating. The steel frames of many automobiles are now manufactured in this way.

Stanard, I. D.—9 A. Casco St., Portland, Me. Vulcanizing.

Stand-pipe.—See Pipe, Stand.

Standard.—A fixed measure, weight, value, or quality, established by law or sanctioned by usage, and which serves as a definite unit for comparison; (2), a term applied in a very wide sense to various supports forming parts of a machine, etc.

Standard Auto & Cycle Works.—41 Woodlawn Ave., Buffalo, N. Y. Garage.

Standard Auto Co.—Woodward Ave., Cor. Alexandrine, Detroit, Mich. (Packard, Oldsmobile.) Supplies; repairing.

Standard Auto Co.—640 Main St., Cincinnati, O. Garage.

Standard Auto Co.—1206 Huron Rd., Cleveland, O. (Packard, Autocar.)

Standard Auto Garage Co.—234 N. Phelps St., Youngstown, O. (Franklin, Buick, Pope-Waverley.)

Standard Auto Garage Co.—257-59 E. Market St., Akron, O. Garage.

Standard Auto Renting Co.—186 E. 73d St., New York City. Automobile renting.

Standard Auto Supply & Mfg. Co.—20 Broad St., New York City. Mfrs. lock switches, plain switches, tire pressure indicators, waterproof switches for boats. Agents for the Skinner rotary triplex tire pumps. Cap. \$10,000. Est. Nov., 1906. Octavius Knight, Pres.; Harry A. Knight, Sec. and Treas.

Standard Automobile Co.—5917 Baum St., E. E., Pittsburg, Pa. (Packard, Franklin.)

Standard Automobile Works.—110 5th Ave., Clinton, Ia. (Moline.) Est. Oct., 1906. Not inc. Charles E. White, Pres.; Milton W. Bailey, Sr., Sec. and Treas.; Alfred M. Londe, Mechanical Director. Garage, 20 cars; repairing.

Standard Automobile Lubricator Co.—361-3 Ellicott St., Buffalo, N. Y. Mfrs. lubricators.

Standard Ball Axle Co.—Lancaster, Pa. Mfrs. axles.

Standard Battery Connection Co.—27 Copeland St., Roxbury, Mass. Mfrs. wire terminals.

Standard Brake Co., The.—101 W. 66th St., New York City. Mfrs. brakes, clutches, brake and clutch cork inserts.

Standard Brazing Co.—88 Broad St., Boston, Mass. Mfrs. brazing compound.

Standard Carbonic Co.—Cincinnati, O. Mfrs. tire inflating tanks.

Standard Carbureter Co., Inc.—Sabin and Mathewson Sts., Providence, R. I. Mfrs. carbureters.

Standard China Works.—Trenton, N. J. Mfrs. porcelain.

Standard Co.—Torrington, Conn. Mfrs. nipples, spark plugs, wire terminals.

Standard Connecting Rod Co.—Beaver Falls, Pa. Mfrs. connecting rods, crank shafts, valve stems.

Standard Foundry & Mfg. Co.—Cleveland, O. Mfrs. gray iron castings.

Standard Foundry Co.—Jersey St. and Lakeview Ave., Buffalo, N. Y. Mfrs. gray iron castings.

Standard Foundry Co.—Hartford, Conn. Mfrs. brass, bronze, aluminum and copper castings.

Standard Garage Co.—1114 Main St., Buffalo, N. Y. Garage.

Standard Gauge Mfg. Co.—Industrial Bldg., Syracuse, N. Y. Mfrs. pressure gauges, water line gauges, lubricators, stampings, safety valves.

Standard Gauge Steel Co.—Beaver Falls, Pa. Mfrs. steel.

Standard Investment Co.—4 Webosset St., Providence, R. I. (Pennsylvania.)

Standard Lamp Mfg. Co.—43 S. Canal St., Chicago, Ill., and Charlotte, Mich. Mfrs. brazing compound, acetylene generators, lamps.

Standard Leather Co.—296 Spring Garden Ave., Allegheny, Pa. Mfrs. enameled top and trimming leather. Cap. \$400,000. Est. 1891. Geo. J. Lappe, Pres. and Gen. Mgr. Chas. H. Lappe, Vice-Pres.; A. A. Lappe, Treas.; J. W. Edmundson, Sec.

Standard Metalwork Co.—Thompsonville, Conn. Mfrs. brass tubing, automobile fittings, gas intakes, exhaust headers, metalwork to specifications. Est. July, 1905. James A. Colvin and James Acton Miller, M. E., parties at interest; Mark Worth Bushnell, Mgr.; James Acton Miller, Mechanical Engineer.

Standard Motor Car Co.—118 E. 9th St., Los Angeles, Cal., and 503 Golden Gate Ave., San Francisco, Cal. (Ford, Acme, Babcock, Soules.)

Standard Motor Car Co.—419 Linden St., Scranton, Pa. (Autocar, Pierce Arrow.)

Standard Motor Construction Co.—180 Whiton St., Jersey City, N. J. Mfrs. standard engines, marine motors. Est. 1895. Cap. \$1,800,000. Lewis Nixon, Pres.; C. C. Riotte, Vice-Pres.; Lewis Spinks, Treas.; E. A. Riotte, Sec.

Standard Oil Co.—26 Broadway, New York City. Mfrs. grease, oils, semi-solid oils.

Standard Pattern Works.—Detroit, Mich. Patternmakers.

Standard Roller Bearing Co.—48th St. and Girard Ave., Philadelphia, Pa. Mfrs. axles, steel balls, ball and roller bearings, hubs.

Standard Rubber Tire Co.—830 N. Broad St., Philadelphia, Pa. Vulcanizing.

Standard Sanitary Mfg. Co.—Pittsburg, Pa. Mfrs. brass pipe fittings.

Standard Stamping Co.—Marysville, O. Mfrs. automobile heaters.

Standard Tool Co.—432 Harrison St., Kalamazoo, Mich. Mfrs. jacks, tools.

Standard Underground Cable Co.—Pittsburg, Pa. Mfrs. insulated wire.

Standard Valve Co.—163 Hawthorne Ave., Brooklyn, N. Y. Mfrs. tire valves.

Standard Varnish Works.—29 Broadway, New York City. Mfrs. enamel, varnishes.

Standard Welding Co., The.—70th St. S. E., and 76th St. N. W., Cleveland, O. Mfrs. clincher, plain, crescent, drop center and flat base vehicle rims, side ring detachable rims, steel tubing and tubular products. Mem. M. & A. M. Cap. \$100,000. Est. July 1, 1899.

Stanford Garage.—112 Alma St., Palo Alto, Cal. (Ford.)

Stanhope.—A single-seated vehicle, with very high seat-panels, originally used as a horse-drawn vehicle. There is usually no back boot, but simply a single panel. A top is never applied to a stanhope.

Stanhope Forge & Machine Works.—27 Stanhope St., Boston, Mass. Repairing.

Stanley & Patterson.—23 Murray and 27 Warren Sts., and 329 4th Ave., New York City. Mfrs. and dealers electric flashlights for automobile work, charging receptacles for electric vehicles, general electrical supplies. Cap. \$269,000. Est. 1881. George L. Patterson, Pres. and Treas.

Stanley Auto & Mfg. Co.—Moreland, Ind. Mfrs. gasoline automobiles.

Stanley Elec. Mfg. Co.—Pittsfield, Mass. Mfrs. ammeters and voltmeters.

Stanley, C. F.—Montreal, Can. (Stanley.)

Stanley, F. E.—Treas. Stanley Motor Carriage Co., Newton, Mass.

Stanley, F. O.—Pres. Stanley Motor Carriage Co., Newton, Mass.

Stanley, I. N.—Kingfield, Me. (Stanley.)

Stanley, John T.—650 W. 30th St., New York City. Mfr. automobile body soap, hand soap, brass polish. Est. 1865.

Stanley Motor Carriage Co.—Newton, Mass. Makers of the Stanley steam car; first marketed in 1898. Twelve different models made since. F. O. Stanley, Pres.; F. E. Stanley, Treas.; C. F. Stanley, Supt.; E. M. Hallett, Pur. Agt.; Prescott Warren, Sales Agent.

Staples & Hanford.—Newburg, N. Y. Mfrs. seat springs.

Stapleton, John.—Foreman of Press Room, Bay State Stamping Co., 380 Chandler St., Worcester, Mass.

Star Auto Garage.—2253 Cottage Grove Ave., Chicago, Ill. Garage.

Star Ball Bearing Axle Co.—Princeton, Ill. Mfrs. ball bearings.

Star Ball Retainer Co.—Lancaster, Pa. Mfrs. ball retainers.

Star Brass Mfg. Co.—108-114 E. Dedham St., Boston, Mass. Mfrs. oil cups, oil pumps, stampings, safety valves.

Star Electrical & Garage Co.—609-13 French St., Erie, Pa. Supplies; garage; repairing.

Star Engineering Co.—Wolverhampton, England. Mfrs. gasoline automobiles. (Star. Royal Starling cars.)

Star Lubricating Co.—232 W. 28th St., New York City. Mfrs. oils.

Star Motor Car Co.—226 Halsey St., Newark, N. J. (Pullman.)

Star Porcelain Co.—Trenton, N. J. Mfrs. porcelain.

Star-wheel.—A ratchet-wheel, with large pointed teeth. It is used in various mechanisms, such as cyclometers, self-acting lathes, etc.

Starboard.—The right-hand side of a boat looking toward the bow.

Stareys, Ltd.—Nottingham, England. Mfrs. bodies.

Staring, W. H.—Supt. Peerless Motor Car Co., 23d St. and Quincy Ave., Cleveland, O.

Stark-Summit Automobile Co.—512 Arch Ave., Alliance, O. (Mitchell, Cartecar, Ford, Marvel.) Est. Jan. 1, 1905. C. L. Morgan, Pres.; Fred L. Morgan, Mgr. Garage, 22 cars; repairing.

Starr & Son, J. G.—Decatur, Ill. (Northern.)

Starr, C. H.—Sec. and Treas. Sterling Mfg. Co., 416 American Trust Bldg., Cleveland, O.

Starr, W. H.—88 Green St., New London, Conn. Garage.

Starter, Automatic.—A steam or elec-

tric car starts as soon as the motor begins to revolve, but such is not the case with a car provided with an internal combustion motor, since the latter must be set in operation first, and the car be afterward thrown into gear therewith. Before an internal combustion motor can be started, it is necessary to draw a charge of the "mixture" of gases into the cylinder, to compress it and to ignite it; in other words, the motor cannot be started until the crank-shaft is rotated, so as to bring about the several initial operations. With a heavy motor-car this is impossible, and a "starting-handle" is therefore provided in front of the motor, and which operates through gear-wheels or chain-drive on the crank-shaft. By giving this handle a few quick turns, the first charges are taken in and the motor starts. To start an internal combustion motor by cranking is a disagreeable and often dangerous operation, and so efforts have long been made to find some system that would permit of starting a motor from the driver's seat through some such simple intermedium as the depression of a pedal or the pushing of a button, etc. In well regulated four-cylinder motors ignited by a trembler-coil it generally suffices, in order to have the motor start, to close the primary circuit by means of a trembler. Such a process, however, is efficacious only when the cylinders are filled with a well-proportioned mixture, something that rarely happens in cold motors. So the processes based upon this principle (of which the Mors self-starter is the prototype) include the use of a gasoline saturator actuated at the moment of starting by means of a small hand-pump within reach of the driver. Two taps are fitted to the cylinder-head, one of which is in connection with a vapor tank, called a "dynamogene," and the other with the compression relief-cock. The cocks are opened by a rod and lever common to both. When starting the motor, after a period of rest, the lever is first pulled back and a stroke or two given to the pump in order to cause air to enter the vapor tank, wherein it becomes charged with gasoline vapor, and while still under pressure, is passed to the combustion-chamber as a mixture ready to be ignited. The cocks are then closed and the current is switched on. Of the numerous other automatic starters that have been devised may be mentioned the Winton, which consists of a cylindrical tank under the frame filled from one of the working cylinders during operations of the motor. In the gas line to this tank is a check-valve with a spring equal to the compression so that the gas is taken in only under compression. Connecting with the tank is a pipe line that

leads to a distributor, which has pipes connecting with the combustion chambers of each cylinder, and within which is a revolving timed distributor which lets the pressure into each cylinder at its firing point. Should the first cylinder into which the pressure enters fail to fire, the pressure enters the cylinder next to fire and so on until the motor is in operation. To bring the self-starter into action it is but necessary to operate a valve on the dash. In the "Monarch" self-starter, air under pressure is stored in a tank until needed, and then relieved into an air-motor which is connected directly with the crank-shaft. The air motor has three cylinders, with flanges and trunk pistons. At the top of each cylinder is a pair of valves, one of which is an inlet poppet-valve, on a stem, which carries a collar, and is held up by a spring acting against the collar. These valves being open, air is drawn into the cylinder. Each cylinder has also an outlet valve, with guide extension.

The three cranks on the crank-shaft are set 120 degrees apart, so that there cannot be a dead set. The crank-shaft has a small pinion at one end, and a sprocket wheel at the other, and it engages the crank-shaft of the automobile by a chain. The air-motor is geared two to one of the gasoline motor, thereby not diminishing to any considerable degree the power from the latter. The motor being in operation and engaging the air-motor, air is pumped and stored in a small high pressure tank, and when the desired pressure is obtained the air-motor automatically stops. The pressure tank is tested to 800 pounds hydraulic pressure, but can be filled and adjusted to any required amount of pressure for each individual motor. The pressure can be stored in the tank indefinitely.

The main motor having stopped, if it is desired to start it, the operator, by means of a lever releases air from the pressure tank, through a pipe, to the cylinders of the air-motor, and the power is communicated to the automobile motor, thereby automatically starting it.

The Hobbs pneumatic starter consists of a cylinder and piston with rack, engaging a piston which rotates the crank-shaft by means of a one-way clutch. A three-way valve, opened by hand, feeds the motor fluid, and is automatically cut off and released. A spring returns the piston to the original position. At the end of the rack a space is left without teeth, to prevent trouble in case of a reversal of the engine. The compressed air used for operating the device is obtained from a pump driven by the engine; or compressed gas from the explosion-chamber, stored in a tank, may be

used instead. With this starter 60 to 80 pounds is the maximum needed to give good working pressure and sufficient reserve. With the above pressure a 12-gallon tank will give sixteen to twenty starts.

In the Auto Improvement Company's "Ever Ready Starter" a tightly wound spring, when released, supplies the force to start the engine. The apparatus consists of a powerful spring incased in a brass-covered steel shell. This spring, when wound, is tightly held by a clutch-band, which, in turn, is connected to a pedal release-lever. The release-lever is located in a position convenient to the operator's foot. By pressing the pedal with the foot, the clutch-band is released and the full power of the spring is thrown on to the engine-shaft, which impulse of the spring will revolve from five to eight complete turns, the revolutions varying according to the compression of the engine.

As soon as started, the speed of the engine automatically rewinds the starter spring until it is tight and the spring is caught and held securely by the clutch-band. The starter is then automatically disconnected from the engine and is again ready for starting.

Starting-box.—A device for starting an electric motor. It usually consists of a rheostat, with three or four points furnished with a handle and devices for releasing on "no load." See Rheostat.

Starting-crank.—See Crank, Starting.

Starting-lever.—See Lever, Starting.

Starting on Spark.—See Motor, Starting a.

State Automobile Co.—Mignonette and Randolph Sts., Pittsburg, Pa. (Logan, Pullman.)

State Novelty Works.—324 Fuller St., Helena, Mont. (Rambler.)

State Street Garage.—468 State St., Rochester, N. Y. Garage.

States, W. M.—Head of Accounting Dept., Helios Mfg. Co., Bridesburg, Philadelphia, Pa.

Stator.—The stationary part of an asynchronous alternating current motor and, in a general way, of all electrical generators.

Statoscope.—An extra-sensitive barometer used by aeronauts, and which at once shows the least variation in altitude.

Statter & Co.—Newhall St., Birmingham, England. Mfrs. jacks.

Staub und Co.—Mannedorf, Switzerland. Mfrs. non-skids.

Staver Carriage Co., The.—76th and Wallace Sts., Chicago, Ill. Mfrs. gasoline automobiles. (Staver motor-buggy.)

Stay.—A bar used to strengthen or stiffen a structure.

Stay-bolt.—See Bolt, Stay.

Stays.—Steel cables or tubes for firmly holding, through screws or bolts, long pieces that are subject to stresses, and for preventing flexion, as the stay on the rear axle of a shaft-driven car.

Steam.—The vapor of water; a term applied to the hot vapor given off at the boiling-point (212° F. or higher). See Ebullition, and, Steam, Superheated. The "total heat" of steam is the amount of heat required to raise 1 lb. of water from the freezing-point (32° F.) to its boiling-point, and then to evaporate it under constant pressure. If it be the temperature of evaporation (or boiling-point), then H , the total heat, will be given by the equation:

$$H = 1091.7 + .305 (t - 32^{\circ}).$$

Steam-boiler.—See Boiler.

Steam Cars.—Of the many types of pleasure steam cars formerly on the American market only a few remain, the chief one being the White; the Stanley and the Lane being the only others of more than local vogue. All of these differ materially, not only in the kind of generator employed, but also in the construction and arrangement of their engine.

The "flash-generator" is a type of water-tube boiler brought out in France by Serpollet in 1889 and improved in America by White in 1898. It consists of long piping, closely coiled, and maintained at a high temperature, so that water pumped into one end issues in the form of steam from the other. It is this form of generator which has met with the greatest success, especially in America, where the White has had a widespread sale. The Lane car employs a combination of flash and water-tube

The Stanley, which was brought out in 1898, uses a vertical fire-flue shell boiler, placed beneath the seat. Boilers of this type are of small dimensions, being frequently but little more than a foot in diameter and height, with flues that are generally of copper and admit a working pressure of from 150 to 180 pounds to the square inch.

All light steam cars use liquid fuel to produce heat for the generator, that most commonly employed being gasoline vaporized by heat in a burner varying in form, but based on the principle of the Bunsen as applied to gasoline stoves. See Burner.

Although many of the early types of American steam cars still use simple engines, the typical engine is the two-cylinder, double-acting, reversible with the Stephenson link-motion. Ordinarily, such engines work simple, but several up-to-

date types of American cars, such as the Lane, are equipped with compound engines which may be run simple when extra power is required.

One of the most efficient among the American compound engines is that operating the White car, all the recent models of which are constructed on the lines of gasoline touring cars, having the motor in front under the bonnet. The engine, which is vertical, is a double-acting compound; that is to say, the steam enters the high pressure cylinder, drives the piston from both ends, and exhausts to the low pressure cylinder, which is usually of twice the diameter. The exhaust from the low pressure cylinder is carried through a large condenser in front, in which the steam is condensed into water exactly in the same way as the temperature is reduced in the radiator of a gasoline-car. The drive from the engine to the road-wheels is by means of a cardan shaft and bevel gear, connected to a rear axle of the same type as that employed in a gasoline-car. There is no change-speed gear, and the speed is practically governed by the throttle, mounted above the steering-wheel. Of the two pumps which supply water to the flash generator, which is situated under the front seat, one is sufficient for ordinary conditions. When a greater amount of steam is necessary, the closing of a hand-valve on the dash sets the second pump in operation. The method by which the supply of water to the generator is automatically shut off when the pressure exceeds a certain fixed amount is wholly independent of the method of varying the amount that can be supplied by this two-pump arrangement. The car is fitted with bevel-gear drive and disconnecting clutch, for the purpose of allowing the engine to run idle for a few moments at the start. In connection with this clutch a secondary gear is provided, by which the car can be run at half speed when the engine is making its full number of revolutions. This lower gear can be used whenever the road conditions necessitate slow traveling and increased power. No reverse-gear is necessary, the valve-motion of the engine being so arranged that the engine will reverse itself.

In the Gardner-Serpollet car, which is widely known and used in France, the generator is placed at the back of the car, and the motor is horizontal and has single-acting cylinders of the same type as those used in internal combustion motors. The drive is by countershaft with a differential and side-chains to the rear wheel, the engine crankshaft driving the countershaft direct through the intermediate of gearings.

Steam-chest.—In a steam-engine, a box containing the slide-valve and seat and the inlet and outlet steam passages.

Steam-cock.—Any tap used for controlling a supply of steam, especially a tap opening into a boiler above the water-line.

Steam, Dry.—Steam unmixed with fine particles of water, but not superheated. See Steam, Superheating.

Steam-engine.—A mechanism for obtaining mechanical energy from the heat energy stored up in steam.

Steam-engine, Compound.—A compound steam-engine is one in which the steam is used several times over in as many separate cylinders, although the term is usually applied to engines operating with two cylinders.

Steam-engine, Cycle.—See Cycle, Steam-engine.

Steam-gauge.—See Gauge, Steam.

Steam-generator.—See Boiler.

Steam-jacket.—See Jacket, Steam.

Steam-lap.—See Lap.

Steam, Live.—Steam which has not yet been expanded, as distinguished from exhaust steam.

Steam-port.—See Port.

Steam-pump.—See Pump, Steam.

Steam, Superheating.—When water is vaporized in a closed vessel such as a steam boiler, there is always some water in contact with the vapor, and the space situated above the liquid contains the maximum quantity of steam that it is possible for it to hold at the temperature of the whole. In such a case the steam is said to be "saturated." Its pressure is called the "maximum elastic force" or "maximum tension" at the temperature considered.

It cannot become greater except by an elevation of temperature to which would correspond a new tension. But the saturant steam can be heated, independently of the water which has produced it, and acquire a high temperature, without an increase of its initial pressure, and this constitutes "superheated steam." Superheated steam may contain a great quantity of heat without on that account being at an enormous pressure, and may pass through a great length of piping without condensing therein. Before there is any condensation, in fact, the temperature must descend to that of the saturant steam of the same tension. Its application to steam-engines permits of a notable increase in the efficiency, and absence of condensation, the principal cause of loss in such engines. Superheated steam behaves almost like a gas at ordinary temperatures. It is produced in boilers provided with superheaters or in special superheaters.

Steam-valve.—See Valve, Steam.

Steam, Wet.—Steam in which partial condensation has occurred, or which has been mixed with water-spray in the boiler.

Steam-whistle.—See Whistle

Steam Carriage Boiler Co.—119 W. 1st St., Oswego, N. Y. Mfrs. body irons, gasoline and kerosene burners.

Stearns & Co., Walter H.—540-50 W. 58th St., New York City. Mfrs. bodies, tops.

Stearns & McKay.—Marblehead, Mass. Mfrs. motorboats.

Stearns Auto Agency.—14-29 Broadway, Seattle, Wash. (Stearns.)

Stearns Co.—The F. B.—Euclid and Lakeview Aves., Cleveland, O. Makers of the Stearns car; first marketed in 1898. Twenty different models made since. Cap. \$200,000. F. B. Stearns, Pres. and Gen. Manager; Roy F. York, Vice-Pres., Sales and Advt. Mgr.; Edwin McEwen, Sec. and Treas.; J. G. Sterling, Designer; Jas. F. Patton, Supt.; Wm. M. Blackburn, Pur. Agent. Agents and dealers: City Motor Car Co., 1363 Bush St., San Francisco, Cal. Hans Motor Car Co., 422 S. 4th St., Minneapolis, Minn. Hughes Automobile Co., 816 Main St., Cincinnati, O. Metropolitan Motor Car Co., Euclid and E. 19th St., Cleveland, O. Peterson, N. E., cor. Broadway and Union Sts., Seattle, Wash. Price, P. M., Johnstown, Pa. Scottsdale Auto Co., Scottsdale, Pa. Western Motor Car Co., 1412 Michigan Ave., Chicago, Ill. White-Savage Auto Co., 43 S. State St., Salt Lake City, Utah. Williams Auto Co., R. O., 621 Broad St., Columbus, O. Wilson, Thos. H., Detroit Club, Detroit, Mich. Wyck-off, Church & Partridge, Broadway and 56th St., New York City.

Stearns, F. B.—Pres. and Gen. Mgr. F. F. B. Stearns Co., Euclid Ave., Cleveland, O.

Stearns, Hardware Co.—Port Arthur, Tex. (Waltham.)

Steatite.—See Talc.

Stebbs Auto Co., H. D.—Chattanooga, Tenn. (Reo, Rambler.)

Stebbins, A. E.—Pres. and Sales Mgr. Waukesha Motor Co., 110 North St., Waukesha, Wis.

Stebbins, E. V.—Vice-Pres. and Gen. Mgr. Willard Storage Battery Co., 1279-81 Bank St., Cleveland, O.

Stebbins Mfg. Co., E.—Springfield, Mass. Mfrs. brass pipe fittings.

Stedman, J. H.—Treas. Selden Motor Vehicle Co., Rochester, N. Y.

Steel.—The result of the combination of iron and carbon in the proportion of about .005 to .015, that is to say, in a much smaller proportion than in cast-iron. Steel melts in the vicinity of 1,400° C. (2,550° F.) and is therefore "carburetted iron" or "decarburetted cast-iron."

This carburetted iron, which was formerly much employed in the form of nearly pure "mild steel," contains a very small proportion of carbon. Since its natural hardness was not sufficient, it was increased either by tempering, or by cementation or case-hardening, which, in spite of their numerous advantages, offered the drawback of giving in most cases a crystalline structure to the long fibers that form the principal character of iron. The hardness was increased, but to the detriment of resistance.

Long researches were undertaken, and trials were successfully made to alloy steel with small proportions of such metals as chromium, nickel, tungsten, etc. Such slight additions of foreign metals permit of obtaining new steels, or rather alloys that present, along with extreme hardness, a very great resistance to elongation, crushing, or torsion, etc., and that, too, so to speak, in the proportions desirable for such a use.

Steel, like iron, is very distinctly differentiated from cast iron, since the latter contains more elements foreign to pure iron and is much less malleable. But it is difficult to decide as to what must be called "iron" and what "steel." Of steel may be given the simple definition that it is a metallic substance which, sensibly hardening through the action of tempering, is composed of pure iron and carbon, the latter in exceedingly small quantity.

Steel may be obtained: (1), by removing from cast-iron a portion only of its carbon, and (2), by adding to iron a proper quantity of carbon.

The manufacture of steel is almost as ancient as that of iron. The processes of production are very numerous, but can be reduced at present to three types, viz., cementation, q. v., the Bessemer process, q. v., and the Martin-Siemens, or open-hearth process, q. v.

Steel, Angle.—A bar of steel, the cross-section of which has the form of the letter L.

Steel, Basic.—Steel produced by the "basic process," q. v.

Steel-belt.—See Steel, Belt.

Steel, Blister.—Steel produced by the cementation process, and the appearance of which is due to the escape of carbonic acid gas.

Steel, Chrome.—Chrome, mixed with steel in proper proportion, gives steel a marked superiority. But, since this simple body is not found in a pure state, ferro-chrome or chromated cast-iron is used for mixing with the steel.

Chrome steel, while exhibiting the resistance of a hard steel, is sensibly less brittle than a steel of the same hardness simply carburetted; its limit of elasticity is almost double that of other steels, and

its resistance to fracture or shock is considerable. Non-tempered chrome steel is, as a general thing, very difficult to break with a heavy hammer, even after it has been notched with a file. It presents a very streaky fracture. The chrome steel usually employed contains 1 to 1.5 per cent. of carbon and 1 to 2.5 of chromium, and, before use, is hardened once at 800° C. (1,472° F.) in oil and then at 850° C. (1,562° F.) in water, this treatment obviating the formation of cracks that occur when water alone is used.

Steel, Chrome-Nickel.—This steel, which is very largely used, possesses all the advantages of nickel steel, together with the increased hardness imparted by the chromium, a very important quality for parts exposed to much friction, such as pinions and axles. There are in use four grades of this steel and one other grade, sold on the market under the mark NY, the composition of which is not disclosed and which is generally used for making pinions.

It has become quite common now to use for crank-shafts, axle and steering arms a nickel steel which will show on test an ultimate tensile strength of 60 tons to the square inch and of the extraordinary elastic limit of 50 tons, on test pieces of 6 inches length and 0.6 inch diameter, the same steel showing elongation of 14 to 16 per cent. and contraction of area at fracture of as much as 65 per cent. The same steel hardened will have a tensile strength of 103 tons per square inch, an elastic limit of 98 tons and elongation of 6 per cent., and contraction of area of fracture of 40 per cent.

Steel, Copper.—This is a very hard and brittle alloy, as white as bismuth, containing 12 per cent. of silicium. It is obtained by melting together three parts of fluosilicate of potassa, one part of sodium and one part of copper turnings, at a temperature that causes the molten liquid to become covered with a very liquid scoria.

Another copper-steel containing 4.8 per cent. of silicium possesses a light bronze color. It is hard and behaves exactly like iron on the lathe and under the file and does not foul the latter like ordinary bronze. Its ductility is excellent, and wire made of it has a tenacity equal that of iron.

Steel, Crucible.—Steel made by melting a mixture of irons or alloys in graphite or clay pots. The mixture is accurately weighed so as to produce the chemical composition desired in the finished product. Pots are used in size varying from 50 to 150 pounds capacity. The size of pots is limited, since they have to be manipulated by hand.

Steel, Damask.—Damask steel is merely steel in which the carbon is not uniformly distributed. Dipped into sulphuric acid, vinegar, beer, lemon-juice or aluminous sulphate of iron, the carbon of its surface is exposed and takes on the characteristic aspect to which the steel owes its name.

Steel, Manganese.—Manganese introduced into steel gives it special qualities both from an electrical and mechanical viewpoint. Small quantities increase its tensile strength, but its proportion of carbon must diminish. With more than 1 per cent. of manganese, steel becomes hard and brittle, and with 4 or 5 per cent. such property is increased. On the contrary, with 8 to 15 per cent. steel behaves very differently. A manganese steel containing 12 per cent. of this metal and 1 per cent. of carbon acquires, according to the forge and tempering processes employed, a high mechanical resistance. Its breaking load varies from 80,000 to 150,000 pounds to the square inch. The same steel with 12 per cent. of manganese has a magnetic permeability almost equal to that of air. The presence of this metal in steel increases its specific resistance, which, in the case of 12 per cent. steel, reaches .000,067 to .000,009 or .000,010 of an ohm.

Steel, Mild.—Steel which contains a low percentage of carbon. It resembles wrought-iron very closely and can be welded.

Steel, Natural.—This kind of steel dates back several centuries. It is obtained in Catalan forges, or else by a partial decarburetion of cast-iron. This process, which gives only a steel wanting in homogeneity, is gradually becoming abandoned.

Steel, Nickel.—This, when combined with chrome, is the most valuable steel at present known. It forms a true alloy which is very homogeneous and very easy to combine. It is much harder than ordinary steel and hardens still further when it is tempered. It melts easily and is but slightly subject to oxidation. It is sometimes called "meteoric iron."

Although nickel-steel may be subdivided into three categories as the proportion of nickel is low, medium or high, the best method of classifying it is as follows, showing not merely the proportion of nickel alone, but also the sum of the nickel and carbon:

1. Low in nickel (1 to 6 per cent.) and very low in carbon (0.10 to 0.25 per cent.)
2. Low in nickel (1 to 6 per cent.) with medium carbon (0.25 to 0.40 per cent.)
3. Medium nickel (10 to 18 per cent.) and medium carbon (0.20 to 0.25 per cent.)
4. High in nickel (30 to 36 per cent.)

and low in carbon (0.12 to 0.20 per cent.)

5. High in nickel (20 to 30 per cent.) and high in carbon (0.60 to 0.80 per cent.)

Experiments have shown that nickel-steel with 2 per cent. of nickel has the minimum degree of fragility, while by a single hardening at 800° C. (1,472° F.) it gives results as good as those furnished by double hardening ordinary carbon steel.

Steel with low carbon and nickel content is now generally used in motor-car work, the usual proportion being: Carbon, 0.10 to 0.15 per cent., and nickel, 1.5 to 2 per cent.; but for axles, shafts and bearing-cups, valves, etc., various other proportions are used. The micro-structure of the steel is also an important feature in the selection of the most suitable materials for the different parts, according to the friction or strains that they have to stand.

Steel, Open-hearth.—Steel made by melting pig iron and steel croppings in a regenerative furnace and oxidizing out the excess of carbon, manganese and silicon; known as the "boiling out" process. Another process sometimes employed in this method is a bath of pig iron to which iron ore is added for the purpose of oxidizing.

Steel, Shear.—Blister Steel that has been formed into fagots (see Fagot) and drawn out.

Steel, Silicon.—A steel largely used for pinions and springs. The composition varies between the limits of 0.30 and 0.70 per cent. carbon, 2.5 and .080 per cent. silicon, and 0.35 to 0.50 per cent. manganese, the proportions of carbon and silicon varying inversely. Its extensive use for pinions is due to the fact that when properly treated the outer skin is rendered hard enough to prevent the metal from spreading and because the fragility cannot be very great in the case of forgings.

Steel, Titanic.—Steel containing a small amount of titanium. It is used to some extent for cutting-tools.

Steel, Tungsten.—By mixing steel with tungsten, a very hard metal, in the proportion of 3 per cent., there is obtained a product which possesses an exceptional resistance, is very tenacious and scratches ordinary tempered steel. Tungsten-steel may be advantageously employed for the manufacture of lathe and adjusting tools, especially for the working of hard metals. It has been tried as a substitute for silicon steel in the manufacture of springs, but without any great success, the greater strength crosswise of the fiber being hardly compensated by the loss in longitudinal strength and the higher price. The average composi-

tion is: Carbon, 0.47 per cent.; manganese, 0.22 per cent.; tungsten, 0.6 per cent.

Steel, Vanadium.—Vanadium steels may be divided into three classes: First, steels containing vanadium solely; second, steels containing vanadium and nickel, and third, steels containing vanadium and chrome.

The first class is ordinarily composed of 0.10 to 0.15 carbon and 0.15 to 0.25 vanadium. The vanadium has nearly as much effect as the carbon on the steel, and the fact of its increasing the tensile strength of pure iron (iron obtained electrolytically), for example, of 540 to 600 pounds per square inch, by the addition of a few parts of vanadium is certainly very remarkable.

This steel, vanadiumized at 1 per cent., is generally employed for parts subject to vibration, since it resists traction admirably and is very elastic.

The second class of vanadium-steel is that containing vanadium and nickel, generally in the proportion of 0.2 to 0.4 per cent. of vanadium and 2 to 6 per cent. of nickel. With these steels are obtained a tensile strength of 786 to 870 pounds per square inch, elasticities of 490 to 695 pounds per square inch, and an elongation varying between 30 and 35 per cent. After tempering, the tensile strength and the elastic limit reach 2,195 and 1,955 pounds, and the elongation is reduced from 10 to 8 per cent. The nickel has a peculiar action, in that up to 8 per cent. it renders the steel hard, and from 8 to 15 per cent. it makes it so brittle that it can be broken with a hammer. From 15 to 25 per cent. the extensibility rapidly increases, and then remains nearly stationary. The adjunction of vanadium makes nickel steel more homogeneous and diminishes the tendency to fragility given to steel by the adjunction of nickel, but it is rarely employed with a greater proportion of nickel than 8 per cent. These steels, because of nickel giving a great shock-resistance, are especially adapted for piston-rods, connecting-rods and small shafts.

In the third class of vanadiumized steels are found vanadium and chrome steels, of which the best proportions are as follows: Carbon, 0.20 to 0.40 per cent.; chrome, 1.00 per cent.; vanadium, 0.20 per cent.

Chrome increases the shock-resistance as well as the tensile strength, but it has a tendency to produce a very hard metal, difficult to work hot, and the welding can be effected with success only electrically, because of the tendency of chrome to oxidize and to become converted into scor-

ia. The addition of chrome to steel renders the metal hard to cut or to work cold. These steels are particularly well adapted for the making of starting cranks, propelling shafts, axles, axle ends, etc.

Steel, Wool.—An abrasive material consisting of a mass of steel shavings, resembling curled hair, and which, while, sharp, does not scratch deeply, but cuts as smoothly as the finest sand and garnet papers.

Steel Swallow Co., The.—Jackson, Mich. Mfrs. gasoline automobiles.

Steele, L. L.—Treas. Churchill Hardware Co., 238-240 Main St., Galesburg, Ill.

Steele Mfg. Co.—Gloversville, N. Y. Repairing.

Steele, Thomas.—Sec., Treas. and Gen. Mgr. The Maxwell & Fitch Co., 218 S. Washington St., Rome, N. Y.

Steele, W. D.—Vice-Pres. Benjamin Electric Mfg. Co., 42 W. Jackson Blvd., Chicago, Ill.

Steels, C. F.—Alpena, Mich. (Cadillac.)

Steen, Chas.—Sec. Charles Wing & Co., Amesbury, Mass.

Steering-arm.—An arm formed integral with a steering-pivot and connected by a drag-link to the arm of another steering-pivot.

Steering-gear.—See Gear. Steering.

Steering-head.—See Steering-kunckle.

Steering-hub.—A steering arrangement in which the steering-pivot and lever-arm attachments are placed within a hollow hub. The construction includes a hollow cylinder, which is penetrated by the end of the axle-shaft and pivot bolted to it, so as to turn in either direction under impulse from a steering-handle fixed to its inner end and running parallel with the main axle-shaft

Steering - knuckle. — "Steering-knuckles" or "steering-pivots" are of several varieties, but those mostly used at present consist of two types, the simpler form of which is known as the "Lemoine pivot." This is an L-shaped forging welded to the extremity of the front axle, the other member of the L projecting upward or downward, and being bored for the reception of the steering-spindle. In the other form, known as the "Elliott pivot," the axle is provided with a T head, the extremities of the T being turned at right angles, so as to form lugs through which the steering-pivot pin passes. This also passes through the steering-neck fitted between the lugs.

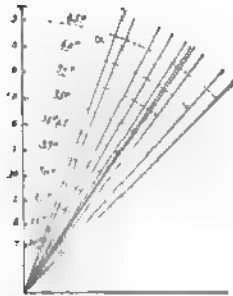
Steering-lever.—A tiller or rearwardly projecting lever mounted on the steering-post of some cars.

Steering-pivot.—See Steering-knuckle.

Steering-post.—The post, called also a "steering-pillar," "steering-column," and "steering-shaft," on which the steering-wheel, or in some cases, a steering-lever, is mounted.

The steering-post usually consists of a tube which incloses rods communicating from the ignition-lever to the commutator, and from the governor to the carburettor-valve. This tube serves merely to inclose these rods and has no other connection with them. When, therefore, the steering-post is turned, the rods remain stationary. To the lower end of the rod is keyed the steering-gear. (See Gear, Steering.)

The manufacturers of automobiles are not agreed as to the "rake" that should be given the steering-post. The angle made by the post with respect to the dashboard in some well-known cars is shown in the accompanying figure: 1, the Bollé car; 2, the C. G. V.; 3, the Delaunay-Belleville; 4, the De Dietrich; 5, the Fiat; 6, the Mercedes; 7, the Mors; 8, the Panhard; 9, the Brasier; 10, the Renault.



Steering, Reversible or Irreversible.—A mechanism or an apparatus transforming energy is "reversible" when it is capable of transforming motion or energy in inverse that for which it was normally established. When the contrary is the case it is "irreversible." An example of irreversible mechanism is afforded by the steering of an automobile by worm and sector or worm and nut. The steering wheel is capable of turning the control-rod, but the latter cannot turn the wheel. As an example of reversible apparatus may be mentioned the dynamo, which transforms mechanical into electric energy, and vice versa.

Steering-rod.—A rod extending from the base of the steering-post to a lever on the steering-pivot through which the steering is effected.

Steering, Side.—Steering by means of a side-lever.

Steering, Wheel.—In a motor vehicle, steering by hand-wheel instead of by lever or tiller.

Steering-wheel.—The "steering-wheel"

is a lever in the form of a rim which serves to move the steering-post of a motor-car. It usually consists of a steel or aluminum wheel faced with wood and connected with the center by metallic arms



cast integral with the rim and its center. On the wheel itself or underneath it are usually placed the gas-intake, spark-advance, and carburettor control-handles. (2) A wheel for steering a motor-boat.

Steering-wheel, Dish.—See Dish.

Steele, R. C.—Sec. The Carlyle Johnson Machine Co., Youngstown, O.

Steevens, N. A.—Temple St., nr. N. Ave., Owego, N. Y. Garage.

Steffes Launch & Automobile Co.—Winona, Minn. Garage.

Steffey Mfg. Co.—2722 Brown St., Philadelphia, Pa. Mfrs. motorcycles.

Steger, H. B.—1014 9th St., Douglas, Ariz. (Ford, Waltham. Est. 1906.

Stehley, M. Ray.—Sec. Banker Bros. Co., Baum and Beatty Sts., Pittsburg, Pa.

Stein, Charles.—Akron, O. Garage.

Stein Double Cushion Tire Co.—Akron, O. Mfrs. solid tires.

Stein, Leo.—Vice-Pres. National Casket Co., Hoboken, N. J.

Steinhart-Jensen Automobile Co.—Masonic Bldg., Joliet, Ill. Mfrs. gasoline automobiles. (Holsman.) Garage at 631 Jefferson St.

Steinmetz, E. G.—Supt. Electric Vehicle Co., 1 Laurel St., Hartford, Conn.

Steinmetz, Jos. A.—Sec. The Autolight & Motor Supply Co., Inc., 506-8 N. Broad St., Philadelphia, Pa.

Stem.—The bow of a boat, the fore part of the keel, and the upper part of which is called the "forefoot," and the lower part the "gripe." (2) The rod of a valve. (3) The cylindrical portion or "barrel" of a screw.

Stempel Fire Apparatus Mfg. Co.—4520 N. 20th St., St. Louis, Mo. Mfrs. fire extinguishers.

Stenger & Rohm.—Main St., Saville, N. Y. (Ford.)

Step.—A step-bearing. See Bearing, Step. (2) The difference between the radii of consecutive pulleys forming a stepped or cone pulley.

Step-bearing.—See Bearing, Step.

Stepanek, W. H.—116 10th St., Cedar Rapids, Ia. Garage.

Stephens, John E.—102 Congress St., Rumford Falls, Me. (Reo, Maxwell.)

Stephenson, C. A.—Mt. Vernon, N. Y. (Aerocar.)

Stephenson, W. W.—Box 24. Bakersfield, Cal. (Rambler, Maxwell.)

Stepney Auto Supply Sta.—Stepney, Conn. (Waltham.)

Stepney Spare Wheel, Ltd.—Llanelly, S. Wales. Mfrs. wood spare wheels.

Stepped.—Provided with a series of steps; as a stepped cone, or stepped gear.

Stepped-pulley.—See Pulley, Stepped.

Steptoe Shaper Co., The John.—2961 Colerain Ave., Cincinnati, O. Mfrs. iron working shapers used for repairing and manufacturing automobiles. Cap. \$125,000. Est. 1845. Geo. Otting, Pres.; O. H. Broateman, Sec. and Gen. Mgr.

Sterling Alternating Ignition Co.—184 Water St., Binghamton, N. Y. Mfrs. spark coils, timers, alternating current ignition devices.

Sterling, Edward.—Pres. Spring Perch Co., 232 John St., Bridgeport, Conn.

Sterling Electric Motor Co.—Dayton, O. Mfrs. charging apparatus, electric generators and motors.

Sterling Engine Co.—Fall River, Mass. Mfrs. gasoline automobile and marine motors.

Sterling Engine Co.—119-121 Grant St., Buffalo, N. Y. Mfrs. gasoline marine motors, gasoline automobiles.

Sterling Garage & Auto Co.—Prince St., Elizabeth, N. J. (Winton.)

Sterling, J. G.—Designer, F. B. Stearns Co., Euclid Ave., Cleveland, O.

Sterling Mfg. Co.—Fall River, Mass. (Locomobile.)

Sterling Mfg. Co.—416 American Trust Bldg., Cleveland, O. Mfrs. ammeters, voltmeters, voltammeters. Cap. \$10,000. Est. March, 1906. Wm. Anthony, Pres.; C. H. Starr, Sec. and Treas.

Sterling Motor Car Co.—180-184 Water St., Binghamton, N. Y. (Ford, Marmon, Jackson.) Est. 1904. Cap. \$25,000. Dudley T. Greene, Pres and Gen. Mgr.; Grover Camp, Vice-Pres.; Ward Decker, Sec. and Treas. and Supt. Garage, 40 to 50 cars. Repairing.

Sterling Oil Co.—Emlenton, Pa. Mfrs. oils.

Stern.—The hind part of a boat.

Stern-frame.—The stern-post, transoms and fashion-pieces of a boat's stern.

Stern-knee, or Sternson.—A timber forming a continuation of the keel, and bolted to the stern-post. See Keelson.

Stern-post.—The principal member of a boat's stern-frame, and usually having a rudder hinged to its after edge.

Stern-suction.—See Cavitation.

Stern, Torpedo.—In a motor-boat, a round and broad outwardly sloping stern; flattened at the bottom so as to reduce the "squatting" which occurs when boats are driven at a high speed. See Squat.

Sternson.—The same as stern-knee, q. v.

Sternbergh, H. M.—Pres. and Gen. Mgr. Acme Motor Car Co., 8th and Elm Sts., Reading, Pa.

Sterns, Chas.—Supt. Forest City Motor Car Co., 109-149 Walnut St., Massillon, O.

Steuben Automobile Co.—92 E. Market St., Corning, N. Y. Garage.

Steuerwald Machinery Co.—St. Ansgar, Ia. (Mitchell.)

Stevens & Co.—99 Chambers St., New York City. Mfrs. cycle and automobile horns, flexible tubes, screens, nuts, bolts, etc., and any small turned or stamped metal articles. Supply house.

Stevens, B. A.—Charles City, Ia. (Locomobile, Cadillac.)

Stevens, Benjamin R.—Gen. Mgr., Hd. of Garage and Repair Dept. The Auto Shop Co., 731 Vincent Ave., N. E., Cleveland, O.

Stevens, Chas. G.—Vice-Pres. General Mfg. Co., Elkhart, Ind.

Stevens Co., E. A.—Fitchburgh Hotel, Main St., Fitchburgh, Mass. (Glide.) Garage, repairing.

Stevens, Dr. F. E.—Bridgton, Me. (Cadillac.)

Stevens-Duryea Company.—Chicopee Falls, Mass. Makers of the Stevens-Duryea car; first marketed in 1901. Four different models made since. Cap. \$300,000. I. H. Page, Pres. and Treas.; J. Frank Duryea, Vice. Pres.

Stevens, J. F.—Pres. Keystone Electrical Instrument Co., 9th St., and Montgomery Ave., Philadelphia, Pa.

Stevens Motor Mfg. Co., Ltd.—Pelham St., Wolverhampton, England. Mfrs. automobile motors, motorcycles motors, carburetters.

Stevenson, B. E.—Sales Mgr. and Advt. Mgr. Logan Construction Co., 2nd and Carrol Sts., Chillicothe, O.

Stevenson, Oscar C.—Sec. York Motor Car Co., 240 N. George St., York, Pa.

Steward & Kennedy.—5208-12 Lake Ave., Chicago, Ill. Garage.

Steward, A. C.—St. Louis, Mo. (Dorris.)

Steward, H. C.—Riverside, Cal. (Rambler.)

Stewart & Clark Mfg. Co.—514 Diversey Blvd., Chicago, Ill. Mfrs. horns, speedometers.

Stewart & Co., Hugh.—414 Main St., Cambridgeport, Mass. Mfrs. wood and metallic bodies, automobile tops.

Stewart, B. F.—Mgr. Elect. Dep. Grip Nut Co., 150 Lake St., Chicago, Ill. 500 5th Ave., New York City.

Stewart Co., A. C.—10th and Santee Sts., Los Angeles, Cal. (Dorris.)

Stewart, C. T.—Council Bluffs, Ia. Garage.

Stewart Mfg. Co. of Canada, D. M.—151 King St. W., Toronto, Canada. Mfrs. gas lamp burners.

Stewart, D. W.—Traverse, Mich. Garage.

Stewart, H. T.—Vice-Pres. Okey Motor Car Co., West Broad and Kimball St., Columbus, O.

Stewart, J. W.—Sec. Lothrop Davis Co., 105 Main St., Tonopah, Nev.

Stewart-Mowhy Co.—3214 Shields Ave., Chicago, Ill. Mfrs. varnishes.

Stienhauer, F. C.—56 Edgewood Ave., Atlanta, Ga. (Rambler.)

Stier, L.—144 rue de Paris, Villiers-sur-Marne, Seine-et-Oise, France. Mfrs. wood and metallic wheels, detachable rims.

Stillman, A. J.—Asst. Treas. United Wire & Supply Co., 109-119 Summer St., Providence, R. I.

Stilson, Adelbert.—1018 Sprague Ave., Spokane, Wash. (Peerless.)

Stilson Motor Car Co.—Pittsfield, Mass. Mfrs. gasoline automobiles.

Stilwell, G. H.—Vice-Pres. H. H. Franklin Mfg. Co., 302 S. Geddes St., Syracuse, N. Y.

Stimpson & Son, E. B.—31 Spruce St., New York City. Mfrs. washers.

Stimula.—St. Chamond, Loire, France. Mfrs. automobile motors.

Stine & Parks.—Arch St., Freemont, O. (Reo.)

Stinemetz, Fred.—Port Chester, N. Y. (Maxwell.)

Stirrup.—A term for a piece of metal in the form of a loop resembling a stirrup, sometimes used in mechanism.

Stirrup-bolt.—Same as bridge and bolt, q. v.

Stitch in Time Vulcanizer Co.—Topeka, Kan. Mfrs. vulcanizers.

Stites, C. W.—Independence, Ia. (Haynes.)

Stivers, R. M.—19 W. 62nd St., New York City. Mfr. wood and metallic bodies.

Stiverson, Frank E.—Cleveland, O. (Atlas.)

St. Jock, Joseph.—St. Johnsbury, Vt. Garage.

St. John & Sons, S. H.—1420 Court Pl., Denver, Colo. Garage.

St. John Rubber Tire Co.—116 Broad St., New York City. Mfrs. cushion tires.

St. Joseph Automobile & Supply Co.—7th and Francis Sts., St. Joseph, Mo. (Oldsmobile.)

St. Louis Auto Station.—465 Colorado Ave., Chicago, Ill. Garage.

St. Louis Automobile Co.—453 N. Boyle Ave., St. Louis, Mo. (Jackson.)

St. Louis Buggy Top Co.—2117-19 N. 9th St., St. Louis, Mo. Mfrs. automobile tops, cloth and carpet trimmings.

St. Louis Car Co.—5200 N. 2d St., St. Louis, Mo. Makers of the American Mors, first marketed in 1905; four different models made since. Cap. \$3,000,000.

Geo. J. Kobusch, Pres.; W. S. McCall, Vice-Pres.; Theo. P. Bailey, Gen. Mgr., Purch. Agt., Sales and Adv. Mgr.; F. G. Kent, Supt. Branch, 1706 Broadway, New York City, L. A. Hopkins, Mgr.

St. Louis Car Co.—1706 Broadway, New York City. (American Mors.) L. A. Hopkins, Mgr.

St. Mars, J.—Mgr. Sales Dept., Consolidated Bicycle & Motor Co., 185 Notre Dame E., Winnipeg, Canada.

St. Nicholas Auto Depot.—55-69 W. 66th St., New York City. Est. 1894. Peter J. Fisher, Mgr. Garage, 65 cars; repairing.

St. Nicholas Ave. Garage.—649-51 St. Nicholas Ave., New York City. Rental service, repairing.

St. Paul Boat Co.—St. Paul, Minn. Mfrs. motorboats.

St. Paul Motor Co.—184 Western Ave., St. Paul, Minn. (Oldsmobile.)

Stock and Die.—Tools used for cutting male threads. The "stock" is a holder for the dies (See Die), commonly provided with a screw by means of which the distance apart of the two halves of the nut may be adjusted, and two straight handles by means of which it is turned to produce the thread.

Stock, Anvil.—See Anvil.

Stock, H. F.—Sec. Ladewig & Stock Co., 227 Madison St., Waukesha, Wis.

Stock Motor Co.—Saginaw, Mich. Mfrs. gasoline marine motors.

Stockbridge, W. D.—Asst. Treas. The Alden Speare's Sons & Co., 369 Atlantic Ave., Boston, Mass.

Stocker, August.—Salt Lake City, Utah. (Peerless, Autocar.)

Stocker, E. H.—Sec. Billings & Spencer Co., Russ and Lawrence Sts., Hartford, Conn.

Stöckicht, Cari.—Niederrad, bei Frankfurt, Germany. Mfr. solid tires.

Stocking.—A sleeve-shaped bag of coarse-woven material which surrounds the air intake-pipe in some carburettors and acts as a filter. See Strum.

Stoddard, A.—18 Main St., Jacksonville, Fla. Garage.

Stoddard, C. G.—Vice-Pres. and Gen. Mgr. Dayton Motor Car Co., Dayton, O.

Stoddard-Dayton Garage.—3959 Grand Blvd., Chicago, Ill. Garage.

Stoddard-Dayton Motor Car Co.—10th and Main St., Los Angeles, Cal. (Stoddard-Dayton.)

Stoddard, J. W.—Pres. Dayton Motor Car Co., Dayton, O.

Stoddard & Co., A. P.—Gloucester, Mass. (Mitchell.)

Stoewer, Gebrüder.—Stettin, Germany. Mfr. gasoline automobiles, gasoline commercial automobiles, electric automobiles. (Stoewer cars.)

Stokes, W. E.—Sales Mgr. Olds Motor Wks., Lansing, Mich.

Stolp Guaranteed Shock Absorber.—20-22 Fletcher St., New York City. Mfrs. shock absorbers.

Stoltz, C. C.—126-128 N. Prospect St., Marion, O. (Autocar, Buick.) Est. 1901. Garage, 75 cars. Repairing.

Stondall & Melaas.—309 E. Wilson St., Madison, Wis. (Rambler.)

Stone & Sons, C.—167 Ogden St., Chicago, Ill. Mfrs. wood and metallic bodies, automobile tops.

Stone Automobile Co., Inc.—1006 Main St., Stroudsburg, Pa. (Stevens-Duryea, Cadillac.) Est. 1905. Cap. \$5,000. C. Stone, Pres.; T. J. Kitson, Treas. Garage, 10 cars, repairing.

Stone, C.—Pres. Stone Automobile Co., Inc., 1006 Main St., Stroudsburg, Pa.

Stone, Geo. H. P.—Harter Block, Ilion, N. Y. (Pope Hartford.)

Stone, H. J.—Los Angeles, Cal. (Frayser-Miller.)

Stone, Julius F.—Sec. and Treas. Oscar Lear Auto Co., Springfield, O.

Stoops, James C.—Mgr. Crescent Auto Top Co., 58 W. 43rd St., New York City.

Stoops, Marie E.—Sole Owner Crescent Auto Top Co., 58 W. 43rd St., New York City.

Stop.—A general term for a device to limit or check the motion of some piece of mechanism.

Stop-cock.—See Cock, Stop.

Stoppage.—See Panne.

Storage Battery Supply Co., The.—239 E. 27th St., New York City. Mfrs. dealers and jobbers supplies, storage batteries, hydrometers, dome lamps. Cap. \$12,000. Est. 1891. T. D. Bunce, Pres. and Gen. Mgr.; A. E. Bunce, Sec. and Treas.

Storage-cell.—See Cell, Storage.

Storero, Luigi.—28 corso Massino d'Azeglio, Turin, Italy. Mfrs. motorcycles, cycles.

Storey Motor & Electric Co.—321 Sussex St., Harrison, N. J. Mfrs. electric motors.

Storm-apron.—See Apron, Storm.

Storm, H. G.—Treas. E. J. Jones Co., Inc., Arlington Heights, Mass.

Storm Mfg. Co.—Foot of Centre St., Newark, N. J. Mfrs. elevators for garages.

Storm, W. A.—Galena, Kan. (Model.)

Storms & Sherwood.—1421 Bedford Ave., Brooklyn, N. Y. (Aerocar.)

Storometer.—A gauge for determining the stage of charging of a storage battery.

Stoughtin, Folkins Co.—224 Commercial St. Portland, Me. (Maxwell.)

Stoutenborough, X.—277 Pearl St., New York City. Mfr. storage tanks.

Stover, H. L.—144 S. Main St., Chambersburg, Pa. (Reo, Rambler.)

Stover Mfg. Co.—Freeport, Ill. Mfrs. brass, bronze, aluminum and copper castings, gray iron castings.

Stover Motor Car Co.—Freeport, Ill. Mfrs. gasoline marine motors.

Stow Flexible Shaft Co.—Philadelphia, Pa. Mfrs. special automobile machinery, flexible shafting.

Stowe, Clarence G.—Hd. of Automobile Dept., The Alden Speares Sons & Co., 369 Atlantic Ave., Boston, Mass.

Stowe, Geo.—203 Commercial St., Worcester, Mass. Garage.

Stowell Mfg. & Fdry Co.—S. Milwaukee, Wis. Mfrs. gray iron and malleable iron castings.

Stowers, J. L.—Havana, Cuba. (Waltham.)

Straight-edge.—A flat rod of wood or metal, of which the edge is used for testing the accuracy of straight lines or plane surfaces.

Strain.—A change in the form or dimensions of a body, produced by the action of forces called "stresses." See Stress.

Strainer.—A filtering device consisting of a disk provided with very small apertures, or, what is better, of a piece of chamois or of very fine wire gauze. Strainers are particularly useful in automobiles for preventing particles of dirt from getting into the pump, into the atomizing tube, or under the needle-valve of the carburetter, etc.

Strait & Son, J. G.—Wainscott, N. Y. (Reo.)

Strake.—The same as "Streak," q. v.

Strake, Garboard.—See Garboard-strake.

Straker & Squire.—9 Bush Lane, London, E. C., England. Mfrs. gasoline commercial automobiles (Straker Squire trucks.)

Straker-Squire, Ltd.—75 Shaftesbury Ave., London W., England. Mfrs. gasoline, automobiles (Straker-Squire cars.)

Stranahan & Eldridge Co.—541 Tremont St., Boston, Mass. (Buick.)

Stranahan, Frank D.—Treas. Albert Champion Co., 541 Tremont St., Boston, Mass.

Stranahan, Robert.—Head Sales Dept., Albert Champion Co., 541 Tremont St., Boston, Mass.

Stranahan, Spencer.—Director Albert Champion Co., 541 Tremont St., Boston, Mass.

Strand.—A number of single threads of some material twisted together and forming one of the principal parts of a rope.

Strang, C. G.—10 N. Nevada Ave., Colorado Springs, Colo. Est. 1899. Garage, 30 cars. Repairing.

Strap.—A metal band placed around a piece of machinery.

Strap, Eccentric.—See Eccentric.

Strap-end.—The end of a steam-engine connecting-rod in which the brasses are held in place by a strap passed around them.

Strass, Lena.—Sec. Walter H. Draper Co., 120-126 S. Railroad Ave., Mount Vernon, N. Y.

Strathmann, Charles.—165 E. 120th St., New York City. Garage.

Stratta, F.—Villa Stratta Castiglione, Turin, Italy. Mfr. elastic wheels.

Stratton Carriage Body Co.—Muncie, Ind. Mfrs. folding automobile bodies. C. H. Stratton, Mgr.

Stratton Co., H. C., Inc.—173 Huntington Ave., Boston, Mass. (DeLuxe, Kisselkar, American Mercedes.)

Stratton, C. H.—Mgr. Stratton Carriage Body Co., Muncie, Ind.

Straub, Robt. M.—Treas. Fort Pitt Automobile Co., Baum and Euclid Ave., Pittsburg, Pa.

Straus Bros. & Co.—Ligonier, Ind. (Matheson.)

Strauss, John Mason.—3d and Chestnut Sts., Louisville, Ky. (Pierce Arrow, Waltham.)

Strauss & Son, J.—197 E. Genesee St., Buffalo, N. Y. Supplies.

Strauss, G. E.—Gen. Mgr. Sartus Ball Bearing Co., 155 Spring St., New York City.

Strauss, Mathew.—707 Main St., Buffalo, N. Y. Supplies.

Strauss, Sig. L.—159 La Salle St., Chicago, Ill. Automobile and general insurance agency. Fire, theft, collision, personal injury, liability of every sort.

Streak.—A strake or continuous line of planking from stem to stern of a boat.

Streak, Paint.—The strake next below the plank-shear.

Streak, Sheer.—The paint-strake of a boat's hull. See Streak, Paint.

Streator Motor Car Co.—Streator, Ill. Mfrs. gasoline automobiles.

Streberger, John.—Hd. of Machine Dept., Jos. N. Smith & Co., Fourth and Porter Sts., Detroit, Mich.

Strecker, H. W.—Treas. and Mgr. Mound City Oil and Supply Co., 204 N. Commercial St., St. Louis, Mo.

Streit Machine Co., A.—1108-10 Harrison Ave., Cincinnati, O. Mfrs. gasoline automobile motors.

Strelan, E. J.—Pres., Treas. and Mgr. Motor Equipment Co., 901 Pike St., Seattle, Wash.

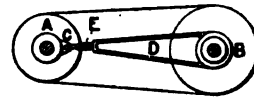
Stress.—Any force or combination of forces tending to produce a strain or pressure, or a change in the size and shape of a body, upon which it acts.

Stress, Negative.—See Negative Stress.

Stress, Torsional.—A twisting stress, or that produced by the application of a couple.

Stretchers, Belt and Chain.—The name applied to these apparatus sufficiently ex-

plains their use. The figure represents a Lorraine-Dietrich chain-stretcher for a motor-car. A and B are respectively the



axis of the chain-sprocket and the rear axle. The stretcher, D, is operatively connected with the axle, and supports the action of the brake. It is jointed at C to the hanger of the chain-sprocket, so that it may follow the motions of the axle with respect to the frame; and its length is regulated by a left-hand screw, E.

Striebe, Wm. F.—Asst. Supt. National Motor Vehicle Co., E. 22nd St., Indianapolis, Ind.

Strieby & Foote Co.—301 Ogden St., Newark, N. J. Mfrs. drop forgings, steps.

Striker.—In a make-and-break system of ignition, the lever attached to the rocker arm, which, when acted upon by the interrupter-catch, breaks the contact of the electrodes in the cylinder. See Igniter.

Stringer.—The highest course of planks in a vessel's ceiling.

Stringer, Bert A.—Calgary, Alberta, Canada. (Wayne.)

Stripping.—The tearing off of the threads of a screw, or of the teeth of a gear-wheel. (2) The permitting of pump-valves to allow water to pass by them.

Strohbeen, J. H.—Walcott, Ia. (Waltham.)

Stroke, Induction.—See Induction-stroke.

Stroke, Power.—See Power, Horse, Motor.

Ström.—16 chaussee d'Antin, Paris, France. Mfrs. wearing apparel, fur coats, hats and caps, hats, caps and coats.

Strong, G.—New Castle, Ind. (Holzman.)

Strong, P. W.—Mgr. Welch Motor Car Co., 1871-73 Broadway, New York City.

Strout, Geo. H.—Sales and Advt. Mgr. Apperson Bros. Automobile Co., Kokomo, Ind.

Strum.—On a locomotive, a feed-pipe strainer consisting of a perforated plate or "rose" placed over the open end of a feed-pipe. (2) On a motor-car, the air intake-pipe of a carburetter covered with a "stocking" to serve as a strainer.

Strut.—A compression member of a framework which fixes two other members at a definite distance apart.

Stuart et Stichter.—20 rue d'Armenonville, Neuilly, France. Mfrs. tricars (Mira).

Stuart, Hamilton.—St. Johnsbury, Vt. (Reo.)

Stuart, J. H.—McIndoe Falls, Vt. (Reo, Premier.) Est. 1903. Garage, 20 cars. Repairing.

Stubbe, F. H.—528 Morris Ave., New York City. Garage.

Stubbe, John H.—Vice-Pres., Fort Pitt Auto Co., Baum St. and Euclid Ave., Pittsburgh, Pa.

Stubbs, W. R.—Stockholder Lawrence Motor Car Co., 13-17 W. Warren St., Lawrence, Kan.

Stud.—A boss or projection designed to hold an attached object in place. (2)

A screw, having no fixed head, which is screwed into a tapped hole in some larger object, the other end being passed through a hole in the metal to be bolted up. A nut on the extremity of the stud screws it up tight.

Stud-bolt.—See Bolt, Stud.

Studebaker Automobile Co.—South Bend, Ind. Makers of the Studebaker car; first marketed in April, 1902. Twenty-nine electric and gasoline pleasure and commercial models marketed since. Geo. M. Studebaker, Pres.; N. J. Riley, Vice-Pres.; C. Studebaker, Jr., Treas.; J. M. Studebaker, Jr., Sec.; Hayden Eames, Gen. Mgr.; C. A. Carlisle, Pur. Agent. (See Chassis next pages.)

Studebaker Bros. Co., of California.—Market and 10th Sts., San Francisco, Cal. (Studebaker.)

Studebaker Bros. Co. of New York.—Broadway and 48th St., New York City. (Studebaker.) Garage, 731 7th Ave.

Studebaker Bros. Co., N. W.—330 E. Morrison St., Portland, Ore. (Studebaker.)

Studebaker Bros. Co. of Utah.—157 State St., Salt Lake City, Utah. (Studebaker.)

Studebaker Bros. Mfg. Co.—378 Wabash Ave., Chicago, Ill. Mfrs. wood and metallic bodies, automobile tops. (Studebaker.)

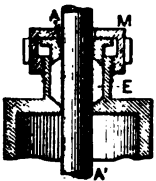
Studebaker Bros. Mfg. Co.—Cor. 15th and Blake Sts., Denver, Colo. (Studebaker.)

Studebaker Bros. Mfg. Co.—13th and Hickory Sts., Kansas City, Mo. (Studebaker.)

Studebaker Bros., Mfg. Co.—317 Elm St., Dallas, Tex. (Studebaker.)

Stuffing-box.—The device by which a steam-tight joint is obtained where a piston-rod enters a cylinder. The rod A (see figure) passes through a hole in the cylinder-cover and which widens out into a cylindrical chamber, E, of larger diameter than the rod, and soft

packing of asbestos or other material is placed in it so as to surround the rod.



The end of the recess is filled by a short tube, A, termed a "gland," which is held in place by a nut, M, or by bolts, and compresses the packing so as to fill the cavity around the rod and make a tight joint.

Sturges, Percy.—Norwalk, Conn. (Oldsmobile, Cadillac, Pope-Hartford.)

Sturgis, E. A.—179 Summer St., Boston, Mass. Mfr. monograms.

Sturmey Motors Ltd.—231 Widdington Rd., Coventry, England. Mfrs. gasoline automobiles (Lotis cars.)

Sturtevant Mill Co.—Harrison Sq., Boston, Mass. Mfrs. brakes, clutches, transmission gears, lubricators, gasoline automobile motors, gasoline automobiles.

Stutsman & Co., C. B.—Monte Vista, Colo. (Ford, Gale, Reliable, Dayton.) Est. 1893. Not inc. Garage, 15 cars. Repairing.

Stutzman, Clyde.—1061 Vine St., Williamsport, Pa. Garage.

Stuyvesant Heights Auto Co.—449 Madison St., Brooklyn, N. Y. Garage.

Styria Farradwerke, Jos. Buch und Co.—Graz, Austria. Mfrs. motorcycles.

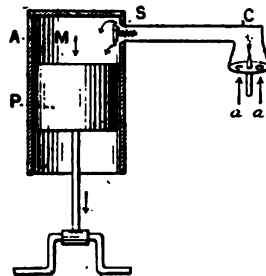
Suberine.—See Cork.

Suburban Auto & Garage Co.—2713-17 Woodburn Ave., Cincinnati, O. (Queen, Rauch and Lang.) Cap. \$10,000. Incorporators, Chas. Kruse, Jacob C. Flack, Chas. W. Schmidt, Carl B. Kruse, W. Witzendacher, Edgar A. Kruse.

Success Auto-Buggy Mfg. Co.—528 De Balliviere Ave., St. Louis, Mo. Mfrs. gasoline automobiles.

Success Automobile Co.—Pico and Hill Sts., Los Angeles, Cal. (Locomobile, Winton, Isotta Fraschini, Mercedes, Panhard, Renault, Simplex.)

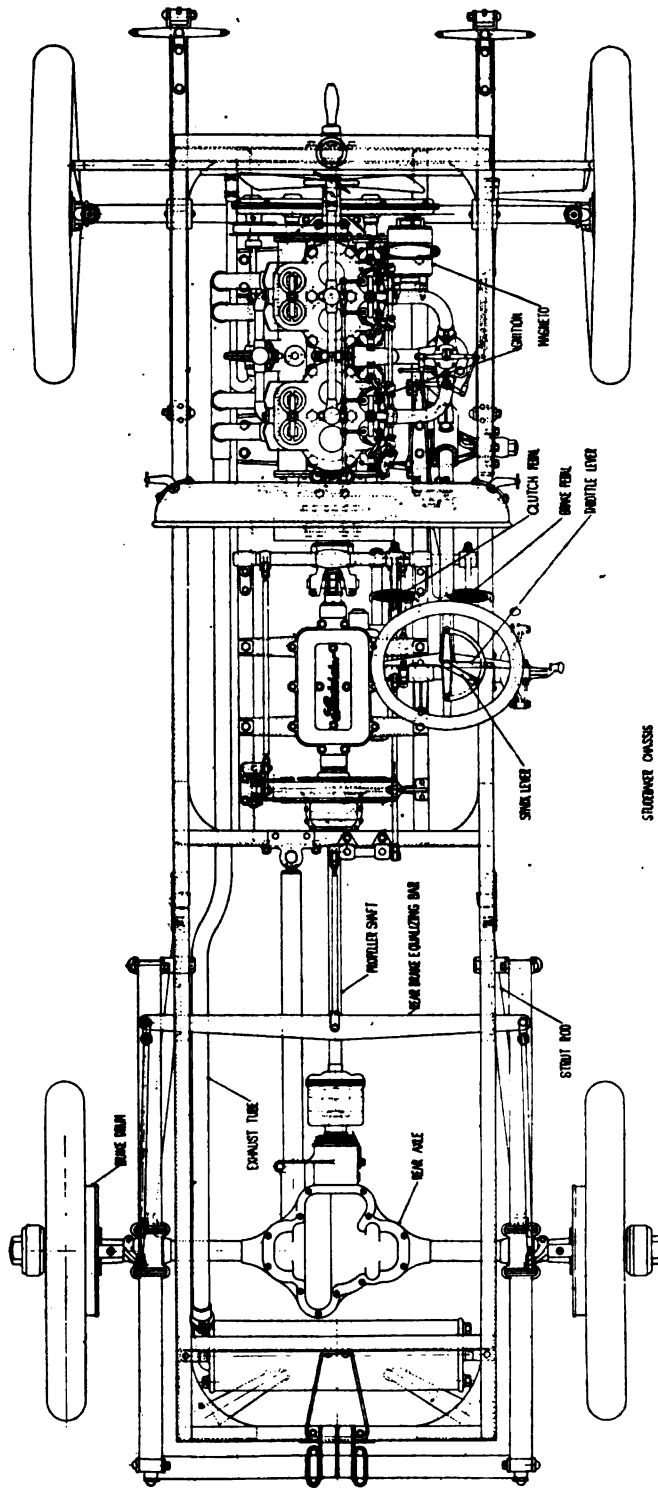
Suction.—"Suction" or "intake" is one of the periods of a 4-cycle motor. It is preceded by the period of expansion of the burned gases, and followed by



that of compression of the new gases. At this period of suction, the piston, P, (see figure), on descending, creates in its rear a vacuum in the cylinder,

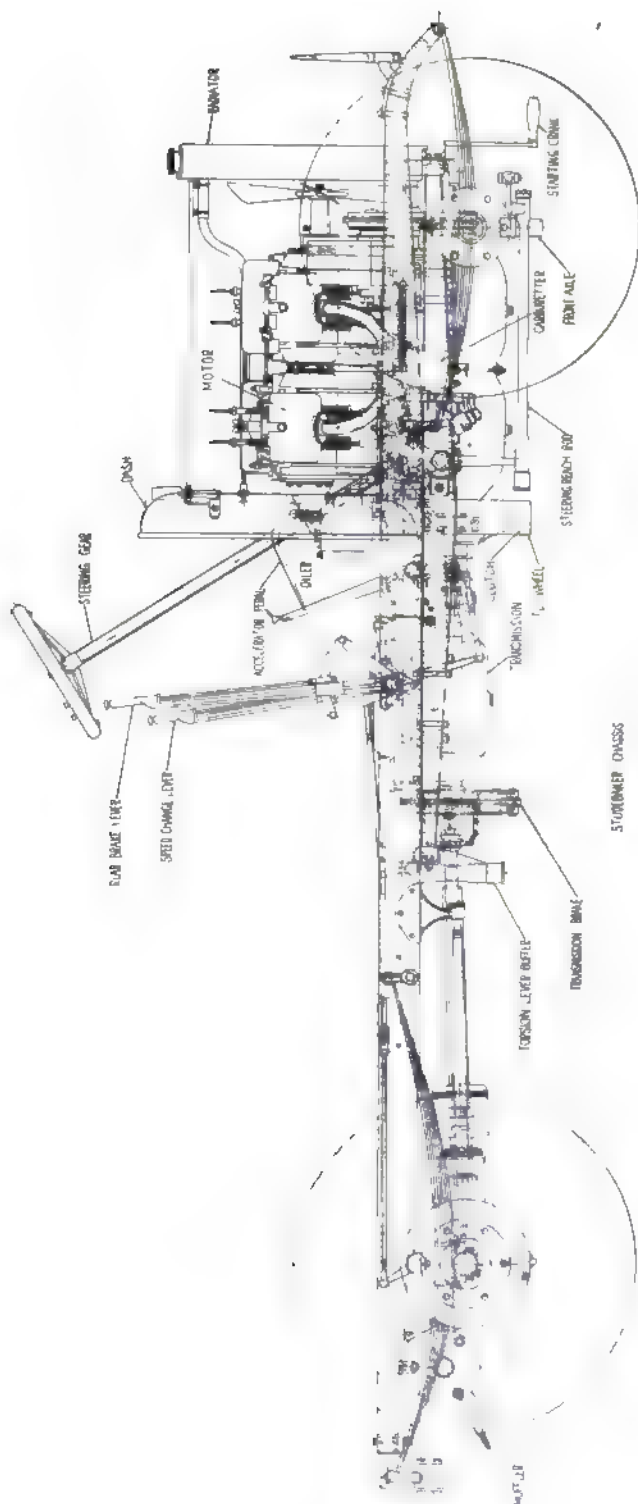
A. The inlet valve, S, is then opened automatically or mechanically. The atmospheric pressure forces the mixture of air and gasoline vapor from the carburetor, C, into the cylinder, M, in which there is a vacuum and in which it will be compressed at the next period by the ascent of the piston. The suction of water in a pump is produced by the same physical phenomenon.

STUDEBAKER CHASSIS



STUDEBAKER CHASSIS

AN ORTHODOX AMERICAN CHASSIS (STUDEBAKER)



STUDEBAKER CHASSIS

AN ORTHODOX AMERICAN CHASSIS (STUDEBAKER)

Suction, Stern.—See Cavitation.

Suddard Motor Cycle Co.—58 Warren St., Providence, R. I. Garage.

Suddard, Wm. A.—10¹/₂ Bellevue Ave., Providence, R. I. Mfr. motorcycles.

Süddeutsche Automobilfabrik Gaggenau.—Gaggenau, Germany. Mfrs. gasoline commercial automobiles. (S. A. G. trucks); tricars (S. A. G.)

Sudre Fils.—17 rue Clignancourt, Paris, France. Mfrs. horns.

Suère.—73 rue Claude Decean, Paris, France. Mfr. motorcycles, motorcycle motors, tricars.

Suffern, H. W.—Sec. J. M. Quinby & Co., 21-39 Division St., Newark, N. J.

Suison Garage Co., Inc.—Main St., Suisson, Solano Co., Cal. (Mitchell, Oldsmobile, Winton, Autocar, Maxwell, National.)

Suisse, La Sportive.—Pub. at 16 rue de Hesse, Geneva, Switzerland.

Sullage.—The dross which collects on the surface of molten metal.

Sullivan Auto Co., D. B.—27 N. Capitol Ave., Indianapolis, Ind. (Lambert.)

Sullivan, J. P.—Mgr. Monte Cristo Garage, New London, Conn.

Sullivan Oil Co.—Chicago, Ill. Mfrs. grease, oils, oil cans.

Sullivan's Auto Garage.—16-18 Myrtle St., Manchester, N. H. (Reo, Ford.)

Sulphating.—Sometimes, through want of proper attention, such as allowing a battery to stand in a discharged condition for a long period, the plates become "sulphated." This condition ("sulphating" as it is called) can be readily detected by a white color of the plates, and can be removed by a long continued charge with a small amount of current. If the sulphating has penetrated deeply into the active material a great deal of persistence will be required in this treatment. It must be understood that sulphating must be guarded against and prevented, as it will permanently injure the battery if allowed to go very far. The effect that it has on the active material is to render it non-conductive. Sulphated material occupies more space than before, and consequently has the effect of disrupting the whole plate and forcing it asunder by a bursting or expanding process. The sulphate itself may be removed, but the bursting it has caused cannot be repaired, except by a thorough overhauling by the manufacturer.

Sulphur.—A simple firm and yellow substance, a divalent metalloid. It is insoluble in water, and melts at about 230° F. or 111° C. In burning it emits the odor of sulphurous anhydride (H₂S), so well known to all who use sulphur matches. Its density is .32. It is met with in nature either in a simple state or combined with other substances (sul-

phate of iron, sulphate of soda, etc.). It is purified by volatilization in special receptacles. The principal source of sulphur is Sicily, which supplies four-fifths of all the material used.

Among the various industrial uses of sulphur is that of the vulcanization of rubber, which consists in mixing rubber with "flowers of sulphur," a process invented by Chas. Goodyear. Vulcanization has the advantage of augmenting the resistance of rubber to traction, and prevents it from becoming soft, and from its losing its elasticity above 80 per cent., or from becoming hard and brittle below 32° F. or 0° C. A small amount of sulphur renders iron "red short" or brittle when at a red heat, and also destroys its welding properties. The addition of manganese lessens the deleterious effects of the sulphur.

"Flowers of Sulphur" are obtained by mixing vapor of sulphur with cold air.

"Roll sulphur" or "brimstone" is prepared by pouring the melted substance into moulds, which are afterward cooled.

Sulphuric Acid.—See Acid, Sulphuric.

Sulson Garage Co.—Sacramento, Cal. Garage. Cap. \$10,000. Incorporators: William Pierce, T. C. Gregory and Leonard E. Wood.

Sultan Motor Co.—Springfield, Mass. Mfrs. gasoline automobiles.

Summer, S. J.—Main St., Valparaiso, Ind. Garage.

Summer, S. J.—Indianapolis, Ind. (Holsman.)

Summey, C. E.—52 Gill Pl., Buffalo, N. Y. Garage.

Summit Automobile Co.—Akron, O. (Cartercar.)

Summit Garage.—Union Pl., Summit, N. J. (Reo.)

Summit Motor Car Co.—Smithfield Ave., Summit, N. J. (Ford.)

Sun and Planet Gear.—The same as epicyclic gear, q. v.

Sunbeam Motor Car Co., Ltd.—Upper Villiers St., Wolverhampton, England. Mfrs. gasoline automobiles (Silent Sunbeam cars).

Sundberg Co., J. A.—271 W. Kenzie St., Chicago, Ill. Mfrs. drop forgings.

Sunbury Mfg. Co.—Sunbury, O. Mfrs. anti-skid devices.

Sunger, E. B.—Treas. S. L. Crosby & Co., 186 Exchange, Bangor, Me.

Sunset Automobile Co.—San Francisco, Cal. Mfrs. gasoline automobiles.

Superheater.—An apparatus for heating steam to a higher temperature than it has on leaving the boiler, and rendering it dry. See Steam, Superheated.

Superior Auto Co.—130 E. 9th St., Los Angeles, Cal. (Haynes.)

Superior Steel Co.—Carnegie, Pa. Mfrs. steel.

Supery, H.—13 rue Cuvier, Lyon, France. Mfr. elastic wheels.

Supplementary Spiral Spring Co.—4528-4530 Delmar Ave., St. Louis, Mo. Mfrs. shock absorbers.

Surface.—The surface of a body limited by plane or curved surfaces, or the surface of a plane figure is measured by its ratio to the unit of surface (square-centimetres in the C. G. S. system). It always contains the product of two dimensions and hence is of the second degree.

The term "area" (commonly employed for the word surface) is applied specially to the amount or measure of a surface, and not to the idea of a surface of any form and extent whatever limited by lines.

Surface Carburetter.—See Carburetter.

Surre, H. J.—Sec. The Corbin Screw Corp., New Britain, Conn.

Surrey.—A vehicle provided with two (sometimes three) seats arranged across the frame, and to which access is obtained from the sides. It differs from the double phaeton in having no framing from the front to the rear seat, and no side doors. "Surreys" are usually fitted with a standing or folding top.

Suspension.—In order that a car shall remain stable and be well suspended it is necessary that the springs shall be very long, shall not have too much deflection, and shall be placed as independently as possible of the car. It is indispensable also that the car shall be suspended between, and not above, the springs. Such an arrangement permits of lowering the center of gravity and remedying the inertia of the mass.

Suspension, Three-point.—A method of suspension, in which, as the name implies, the power-plant of a motor-car is hung at three points. By such an arrangement, absolute flexibility is secured, since no matter how much the car frame is racked and distorted on rough and uneven roads, the power-plant will remain unaffected, and perfect alignment of the motor and transmission bearings will be assured.

Sussfield, Lorsch & Co.—37 Maiden Lane, New York City. Mfrs. eye shields.

Sutherland, R. L.—115 W. Maryland St., Indianapolis, Ind. (Glide.)

Sutphen, H. R.—Gen. Mgr. The Electric Launch Co., Ave. A and North St., Bayonne, N. J.

Sutter & Gamble.—Burlington, Ia. (Maxwell.)

Sutton, John W.—Garages, 342-344 Glatbush Ave., 10-12 Clinton St., Brooklyn, N. Y. Electric Battery Station, 811-13 Union St. Supplies, garage, repairing.

Sutton, John W.—Pres. A. G. Southworth Co., Inc., 1733 Broadway, New York City.

Swage.—A tool, called also a "swedge," used for shaping wrought iron, sheet

metal, etc., through hammering or pressure. Swages are often in pairs, the upper tool being fitted with a handle, and the lower one with a spur or tail. The lower swage is fitted into the square hole in the face of the "swage-block" or anvil, and the piece to be worked is laid on it. The smith then places the upper swage on the work, while the helper strikes the back as directed.

Swager.—Utrecht, Holland. Mfr. motorcycles.

Swain Engine Co.—2239 State St., Chicago, Ill. Mfrs. gasoline automobile motors.

Swallow.—The channel or space between the pulley and the block in which it turns. See Pulley.

Swampscott Auto Co.—Lynn, Mass. (Pope-Hartford.) Garage.

Swan & Finch Co.—151 Maiden Lane, New York City. Mfrs. oils.

Swanbrough, E. W.—Gen. Mgr. Pacific Coast Auto Co., 1414-16 Broadway, Seattle, Wash.

Swanget, H. E.—Detroit, Kan. (Waltham.)

Swartwout, D. K.—Pres. and Treas. The Ohio Blower Co., 330 Prospect Ave. N. W., Cleveland, O.

Swartwout, J. D.—Vice-Pres. The Ohio Blower Co., 330 Prospect Ave. N. W., Cleveland, O.

Swartz & Co., J. I.—Bridgeton, N. J., care W. H. Garrison, 53½ E. Commerce St. (Rapid.)

Swartz, Chas.—Supt. York Motor Car Co., 240 N. George St., York, Pa.

Swedish Aeronautical Society.—Stockholm, Sweden. Capt. K. Amundsen, Sec.

Sweeney Sporting Goods Co.—Albany, N. Y. (Waltham.)

Sweep.—A term applied to that portion of the cylinder-length traversed by the piston from end to end of the stroke.

Sweet, Charles F.—61 Market St., Hartford, Conn. Mfr. grease, oils, automobile body polishes and soaps.

Sweet, Frank E.—Vice-Pres. Prest-o-Life Co., 20 South E St., Indianapolis, Ind.

Sweet, J. D.—Pres. American Gasolene Motor Co., Baldwinville, N. Y.

Sweet Tire and Rubber Co., The.—Batavia, N. Y. Mfrs. solid tires.

Sw eigert, Frank.—44 W. Mulberry St., Kokomo, Ind. (Ford.)

Swenson, Mrs. R. A.—185 Prairie Ave., Providence, R. I. (Indian and Merkel motorcycles.) Est. 1900. Garage, 150 motorcycles. Repairing.

Swetland, H. M.—Pres. and Bus. Mgr. The Automobile, Flatiron Bldg., New York City, and Motor Age, 1200 Michigan Ave., Chicago, Ill.

Swezy, C. L.—Middletown, N. Y. (Dragon.)

Swift, Chas. I.—Millbrook, N. Y. (Mitchell.)

Swift, E. G.—Pres. Michigan Bolt & Nut Works, Foot Mildrum Ave., Detroit, Mich.

Swift Motor Co., Ltd.—Coventry, England. Mfrs. gasoline automobiles. (Swift.)

Swinehart Clincher Tire & Rubber Co.—Akron, O. Mfrs. solid, pneumatic and cushion tires. Branches: 1843 Broadway, New York City; 1231 Michigan Ave., Chicago, Ill.; 239 Jefferson Ave., Detroit, Mich.; 893 Main St., Buffalo, N. Y.; 117-19 Long Acre, W. C., London, England.

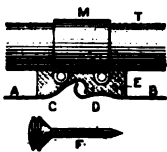
Switch.—An electrical device for making or breaking a circuit, or transferring a current from one conductor to another.

Switch, Chopper.—A switch used in magneto ignition for cutting out the cylinders for the purpose of testing.

Switch, Knife.—A switch in the form of one or more blade-like members, which form a contact by entering between pairs of springs.

Switch, Pin.—A switch in an electric circuit in which connection is made by inserting a pin between plates.

Switch, Plug.—A switch for interrupting the ignition circuit on an automobile or motorcycle. It consists of a copper plug of small diameter furnished with a



vulcanite or wooden head. Two flat strips, the ends of which are spaced so that when the plug is in place the current passes, and, when the plug is

removed, they do not touch, are each connected to the leading wire. The removal of the plug breaks the circuit, and acts as a measure of security against theft or mischief when the car is left unattended.

In the figure, A and B are the flat strips fastened to the insulating block, E, which is held to the tube, T, by a clip, M. The switch-plug, F, is placed between the curved ends of A B C and D, thus completing the circuit A C F D B. See Cut-off Plug.

Switch, Two-way.—A switch used with two ignition batteries, and by means of either of the two may be brought into instant use or the current be switched off.

Swivel.—A coupling device between two objects which permits either to rotate independently of the other.

Swivel-joint.—See Joint, Swivel.

Swoyer, A. P.—Treas. and Sec. Helios Mfg. Co., Bridesburg, Philadelphia, Pa.

Swronsky.—Litzeiskaia, St. Petersburg, Russia. Mfrs. gasoline automobiles.

Symonds, Paul.—Purch. Agt. Monarch Motor Car Co., Chicago Heights, Ill.

Synchronising.—The regulation of two or more machines or pieces of apparatus so that their movements or the effects produced by them shall occur simultaneously.

Synchronous Current.—See Current, Alternating.

Syndicat des Brevets Viratelle.—49 rue du Surmelin Paris, France. Mfrs. Viratelle motorcycles.

Synnestvedt Machine Co.—4117 Liberty Ave., Pittsburg, Pa. Mfrs. electric commercial automobiles, electric automobiles.

Syracuse Aluminum & Bronze Co.—530 Leavenworth Ave., Syracuse, N. Y. Mfrs. aluminum, manganese bronze, aluminum bronze, phosphor bronze and bronze castings. Member M. & A. M. Cap. \$25,000. Est. 1905. Willard C. Lipe, Pres.; Alexander T. Brown, Vice-Pres.; H. Winfield Chapin, Sec.; Chas. L. Ackerson, Mgr. and Treas.

Syracuse & Eldridge Glove Co.—924 S. Salina St., Syracuse, N. Y. Mfrs. gloves. Cap. \$15,000. Est. 1885. H. L. Northrop, Pres. and Treas., Gen. Mgr.; M. E. Northrop, Sec.; L. S. Chapman, Vice-Pres.

Syracuse Automobile Club.—Forman Wilkinson, Sec., S. A. and K. Bldg., Syracuse, N. Y.

Syracuse Auto Supply Co.—118-20 S. State St., Syracuse, N. Y. (Maxwell.) Mfrs. storage batteries.

Syracuse Gear Co.—Syracuse, N. Y. Mfrs. transmission gears.

Syracuse Malleable Iron Works.—Syracuse, N. Y. Mfrs. malleable iron castings.

Syracuse Motor Car Co.—511 S. Clinton St., Syracuse, N. Y. (Winton, Cadillac.)

Syracuse Rawhide Mfg. Co.—Niagara and Shonnard Sts., Syracuse, N. Y. Mfrs. rawhide gear wheels.

Syracuse Rubber Co.—212-14 S. Clinton St., Syracuse, N. Y. Successors to Frank C. Howlett. Automobile supplies. Est. Sept. 1, 1906. Cap. \$25,000. Frank C. Howlett, Pres., Treas. and Mgr.; B. R. Newhall, automobile dept.; H. G. Glismann, dry sundries and mechanical dept.; W. H. Clasen, footwear dept. Repairing automobile tires.

Syracuse Smelting Works.—36th St. and 10th Ave., New York City. Mfrs. Babbitt metals, solder.

Szisz, François.

—28 Rue de Meudon at Billancourt-sur-Seine. Born at Szeghalom, Hungary, Sept. 20, 1873. Foreman of the works of Renault Frères, for whom he has often raced with great success and for whom he won the Grand Prix of 1906.



T

T.—Symbol for "time."

T-bolt.—See Bolt, T.

T-iron.—See Iron, T.

T-joint.—See Joint, T.

Ta.—Symbol for "tantalum."

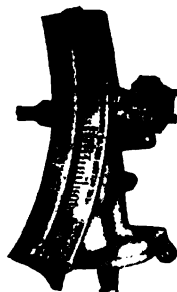
Ti.—Symbol for "titanium."

T-square.—An instrument having the form of a T used by draughtsmen for drawing, setting out or testing right angles.

Table.—That part of a machine or machine tool on which material is laid while being operated on.

Taber, J. U.—201 E. 7th St., Los Angeles, Cal. Repairing.

Tachodometer.—An instrument for measuring speed and distance, it being a speedometer and odometer combined. The instrument, which is actuated by a flexible shaft from a front wheel of the car, operates without springs, and its accuracy is unaffected by temperature changes, vibrations and ordinary wear. The standard registration is 40 miles an hour, but the instrument is supplied also with indicator maximums of from 60 to 80 miles an hour.



Tachometer or Tachymeter.—A device for measuring the number of revolutions per minute of some rotating part of a machine. A speed indicator.

Tachometric Watch.—See Watch.

Tacking.—Directing a vessel on to another tack when beating against the wind, so that the wind comes on the bow.

Tackle.—An apparatus, or that part of an apparatus, by which an object is grasped, moved or operated.

Tacoma Automobile Co.—743 S. Tacoma Ave., Tacoma, Wash. (Franklin.)

Taddeoli, E.—25, rue de L'Arquebuse, Geneva, Switzerland. Mfrs. motorcycle motors.

Taffrail.—A transverse rail constituting the uppermost member of a vessel's stern.

Taft & Co., W. E.—150 Broadway, Providence, R. I. (Glide.)

Taft, H. Fred'k.—Sec. National Auto Co., 957 S. Main St., Los Angeles, Cal.

Taft-Pierce Co.—Woonsocket, R. I. Mfrs. machine work.

Taggart, B. B.—Watertown, N. Y. (White.)

Tail-light.—A lamp placed at the rear of a vehicle so as to be visible to the vehicles following.

Tail-valve.—See Valve, Tail.

Taking up.—Shortening or tightening fittings, moving parts, etc., which have become elongated or loosened by wear.

Talbot, Arthur Wilbour.—Automobile Editor Providence Journal, Providence, R. I. B. Cambridge, Mass., Oct. 23, 1884. Ed. Mass. Institute of Technology, class 1906.

Talbot, Dudley.—Treas. Brown-Talbot Co., 19 Oakland St., Salem, Mass.

Talbot, John.—Pres. Brown-Talbot Co., 19 Oakland St., Salem, Mass.

Talc.—A soft and unctuous silicate of magnesia, called also "soapstone." When reduced to powder, it is employed in the rubber industry as a lubricant, and for preventing the sticking of double tube pneumatic tires. It is used also in heat-resisting insulation in spark-plugs and other electrical apparatus.

Taliaferro, W. T.—258 Broadway, New York City. Mfr. gasoline funnels.

Tallmudge, J.—Sec. Treas., Gen. Mgr. Sales and Adv. Mgr. American Gasoline Motor Co., Baldwinville, N. Y.

Tallman Stables.—17 Dill St., Auburn, N. Y. (Rambler.)

Talmon Electrical Engineering Co.—38-90 Center St., New York City. Mfrs. ammeters and voltmeters.

Talty, J. E.—Pur. Agt. Pope Motor Car Co., Toledo, O.

Tamblin, Dr. J. H.—Copenhagen, N. Y. (Knox.)

Tampa Automobile & Garage Co., The.—312 Washington St., Tampa, Fla. (Mitchell.)

Tampa Cycle Co.—508 Franklin St., Tampa, Fla. (Cadillac.)

Tampa Harness & Wagon Co.—1007-1009 Franklin St., Tampa, Fla. (Pope-Toledo, Pope-Hartford, Pope-Waverley.) Est. 1890. T. N. Henderson, Mgr.

Tanberg Auto Co.—River and Gibson Sts., Eau Claire, Wis. (White, Buick, Oldsmobile, Pope-Waverley.) Est. February, 1907. Cap. \$25,000. J. C. Tanberg.

Pres.; C. A. Tanberg, Sec. and Treas.; H. N. Hastings, Vice-Pres. Garage, 20 cars. Repairing. Branch at 312 State St., La Crosse, Wis. W. J. Broyton, Mgr.

Tanberg, C. A.—Sec. and Treas. Tanberg Auto Co., cor. Gibson and River Sts., Eau Claire, Wis.

Tanberg, J. C.—Pres. Tanberg Auto Co., cor. Gibson and River Sts., Eau Claire, Wis.

Tang.—The tapering end of a tool (such as a file or chisel) which is driven into the wooden handle.

Tangent-screw.—See Screw, Tangent.

Tangent-spoke.—See Spoke.

Tangent Wheels, Ltd.—Grove Road, Balham, London, S. W., England. Mfrs. wooden wheels.

Tanite.—A trade-name for a cement of emery and some binding material used as a compound in the manufacture of emery-wheels.

Tank.—A reservoir for carrying liquid on a motor-vehicle.

Tank, Feed.—A reservoir carried on steam-cars to contain a supply of water to feed the boiler, and provided with a screw-plug for filling.

Tank, Gasolene.—A reservoir for carrying fuel supply, generally made of sheet copper and provided with a partition to prevent the splashing of the liquid. The gasolene-tank may be made either for gravity or pressure feed. In the majority of American automobiles the system employed is the gravity, in which case the tank is placed higher than the carburetter. In some cars the gasolene-tank is carried at the rear, and at a level lower than that of the carburetter, necessitating the raising of the gasolene by air-pressure from a pump connected to the engine by hand-pump pressure, or the pressure of the exhaust. The number of pounds pressure per square inch required in a tank to raise the gasolene is not more than four pounds, and, in many cases, two pounds is sufficient. If a small gasolene tank higher than the carburetter be provided, the pressure in the main tank will be sufficient before the auxiliary one is empty. Pressure-tanks may be placed in any convenient position, since the pressure keeps the supply constant, but the filling screw-plug must be kept air-tight. In order to ascertain the level of the gasolene in the tank, gauge-cocks may be fitted in the side or end.

Tank, Oil.—A reservoir for containing lubricating oil, and usually containing a sufficient quantity for long distances.

Tank, Tire.—A portable seamless, pressed steel, cylindrical reservoir, filled with compressed air, and by means of which an automobile tire can be almost instantly inflated to any desired pressure.

Tank, Water.—A reservoir, usually of galvanized iron, for holding the supply of cooling water. Many modern motor-cars are not provided with a water-tank, which has been found to be superfluous owing to the increased size and efficiency of the radiator, which, on that account, requires less water. In order to determine the quantity of water in the tank, a small gauge-glass may be fitted to the side.

Tanner & Co.—New Bedford, Mass. Garage.

Tanner, W. A.—St. John's, Kan. Garage.

Tantalum.—A rare metal, when pure resembling platinum in color. Atomic weight 183. It melts between 2,250° F. and 2,300° F. Its tensile strength is about the same as that of steel, alloyed with which it develops remarkable metallurgical properties. It is employed also for forming the filament of the tantalum lamp.

Tanty, J. C.—Head Automobile Dept. Siegel Cooper Co., Sixth Ave., 18th to 19th Sts., New York City.

Tap.—A cylinder of highly tempered steel, with a thread at one end and used for cutting internal screw-threads. "Entering" taps (Fig. 1) having a slight taper are used to start the work; a second tap

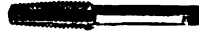


Fig. 1



Fig. 2

with less taper is then used; and the thread is finally finished with a parallel or a "plug tap" (Fig. 2). (2) A faucet or cock. See Cock. (3) A branch conductor of electricity leading from the main circuit.

Tap-bar.—A pointed bar by means of which the tap-hole of a furnace is opened.

Tap, Compression.—See Cock, Compression.

Tap-hole.—In a puddling-furnace, a hole through which to draw off slag.

Tap-plate.—A steel plate provided with a number of holes which are threaded and notched for cutting threads on blanks.

Tap-stock.—A tool called also a "tap-wrench" consisting of a steel bar provided with a rectangular slot for the reception of a tap, and employed for revolving the latter.

Tape, Insulating.—A very adhesive insulating material used for winding around joints or electric wires, and made by saturating cotton tape with a mixture consisting of 30 parts of coal tar and 40 of resin.

Tape-line.—A measuring line, called also simply "tape," made of fabric or steel and winding into a case.

Taper-bearing.—See Bearing, Ball.

Taper-pin.—See Pin, Taper.

Tappet.—An arm, or lever projecting from some movable part of a machine in such a manner that the motion of such part brings the arm into contact intermittently with some other part, to which it communicates an intermittent motion.

Tappet-rod.—A rod, called also a "push rod," for lifting the valves of an internal combustion motor.

Tapping.—Cutting a helical groove in a cylindrical hole, by means of a tap. See Tap.

Tar.—A viscid brown-black resino-oil-aginous compound obtained by distilling resinous wood in close vessels or in ovens of peculiar construction, used for spreading on roads to prevent dust.

Tarbill, J. W.—Vice-Pres., Treas. and Gen. Mgr. Citizen's Motor Car Co., N. E. cor. Seventh and Main Sts., Cincinnati, O.

Tardy, A.—17 Faubourg Saint-Jacques, Valence, Dome, France. Mfr. primary batteries.

Taride.—18 bvd. Saint-Denis, Paris, France. Publishers maps.

Tarkington, J. A.—Supt. Kissel Motor Car Co., Hartford, Wis.

Tarkio Automobile Co.—Tarkio, Mo. Garage.

Tarkio Electric & Water Co.—Tarkio, Mo. (Pope-Waverley, Waltham.) Est. 1880. Cap. \$20,000. Officers: D. Rankin, W. F. Rankin and W. F. Marshall. Repairing.

Taron et Cie.—15 rue des Martyrs, Paris, France. Publishers maps.

Tarrant Foundry Co.—Chicago, Ill. Mfrs. gray iron castings.

Tarrant, W. P.—12 Maple Ave., Saratoga, N. Y. (Dolson.)

Tarring.—A method of treating road surfaces to prevent the raising of dust, and increase the adherence of dust to the soil. It is usually accomplished by spreading hot tar under pressure over the surface by means of sprinklers or other apparatus.

Tart, Henri Leon.—Automobile dealer, 25 Rue Duret, Paris, France. Born at Orleans May 28, 1868. He was formerly a bicycle racer, but turned his attention to the automobile in 1898. He has raced on tricycles, voitures, light cars and heavy cars. He is general agent for the Berliet cars in Paris.



Tasher, B. B.—Minot, N. D. (Ford.)

Tatem & Son, J. B.—Putnam, Conn. (Knox.)

Taunton Motor Carriage Co.—Taun-

ton, Mass. Mfrs. gasoline and kerosene burners.

Taunton-New Bedford Copper Co.—Taunton, Mass. Mfrs. sheet and rod brass and copper.

Taurus Societa Anonima per Acciona.—48 bis, via San Chiara, Turin, Italy. Mfrs. bodies.

Taxameter Westendarp und Pieper.—Mauerstrasse 86, Berlin, Germany. Mfrs. speed indicators.

Taxicab.—A public hack provided with a taximeter. See Taximeter.

Taximeter.—An instrument used on taximeter motor-cabs or "taxicabs," as they are called in England, for automatically calculating and indicating, at all stages of a trip, the exact amount of fare that must be paid by the passenger, and thereby rendering it impossible for the driver to make excessive charges or to withhold a part of the receipts for himself. In Europe, several instruments of this kind, of somewhat complicated mechanism, have been constructed, two of which (one of French and the other of German make) have recently been introduced, along with a line of Delahaye and Darracq landaulet motor-cabs, which are now being operated as public hacks in the streets of New York City. Mr. J. W. Jones, of the Jones Speedometer Co., believing, from his investigations, that the foreign instruments were not sufficiently perfect to insure their success in the United States, has devised an instrument now known as the "Jones Taximeter" from which, it is claimed, all the defects found in the European apparatus have been eliminated. The instrument (see figures) is about 7 inches in diam-



eter by 4 inches in thickness. It has a silver dial face in front with figures indicating the rate or tariff, the total fare to be paid by the passenger, and a separate indication for the extras. The reverse side of the instrument has

a dial giving a total of all moneys received by the driver, the total mileage made by the cab and the trip mileage, which can be reset by the driver if so desired. Also a separate count of the number of trips with single and with double tariff. A vacant sign is also displayed on the reverse side of the instrument which, when a passenger enters the vehicle, is thrown to the right by the driver until it assumes a horizontal position, indicating on the Tariff dial

and, at the same time ringing up, an initial charge of 30 cents for the first half mile. After the first half mile has been traversed an additional charge of 10 cents for each quarter mile is added to the total. In the event of there being a trunk or other baggage for which there is an extra charge, the driver turns a knob on the reverse side of the instrument, which causes the extra charge to be indicated under the heading "Extras" on the dial, and also adds the amount of the extra charge under the head "Total Fare."

On the passenger leaving the vehicle and paying the fare indicated, the driver throws the vacant sign to the vertical position, which instantly resets the figures indicated under "Total Fare" and also those under "Extras" to zero. In the event of four or more passengers entering the vehicle, the driver throws the vacant sign to the left until it assumes a horizontal position, when the same initial charge is made, which after a third of a mile has been traversed an additional charge of 10 cents for each one-sixth of a mile.

The taximeter contains also a clock mechanism, which, when the "Vacant" sign is down and the vehicle is standing, causes a charge of 10 cents to be registered for each 6 minutes of waiting, and a like amount to be added to the total. This gives the entire amount from the passenger in a single total, also the entire amount due the cab company.

Taylor & Ascher.—408 Main St., Asbury Park, N. J. Garage.

Taylor, A. O.—Mgr. Cushman Motor Co., 2020 N Street, Lincoln, Neb.

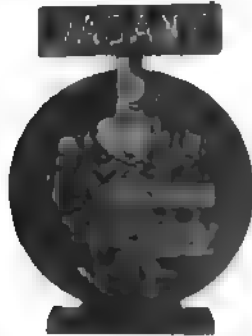
Taylor Automobile Co.—33 Orange St., Albany, N. Y. (Locomobile.) Garage, repairing.

Taylor Bros. Co.—Rochester, N. Y. Mfrs. hydrometers.

Taylor, Chas. S.—Great Barrington, Mass. Garage.

Taylor Co., H. D.—101-105 Oak St., Buffalo, N. Y. Mfrs. curtain fasteners and metal trimmings.

Taylor Co., N. & G.—308 Chestnut St., Philadelphia, Pa. Mfrs. tinplate andterne plate of all kinds; steel sheets No. 6 to No. 16 gage. U. S. standard; fine solders, pig tin, pig lead, open hearth steel billets 1½ in. sq. to 3½ in. sq inclusive, for forging or rerolling purposes. Est. 1810.



Taylor F. S.—Pres. Pilot Garage & Supply Co., Worcester, Mass.

Taylor Gue, Ltd.—84 Peel St., Birmingham, England. Mfrs. springs.

Taylor Iron & Steel Co.—100 Broadway, New York City. Mfrs. steel castings.

Taylor, J. F.—Asst. Sec. and Treas. American Oak Leather Co., Kenner St. and Dalton Ave., Cincinnati, O.

Taylor, James.—Taylor House, Coatsville, Pa. (Rambler.)

Taylor, L. J.—Earlville, Ill. (Reo, Premier.)

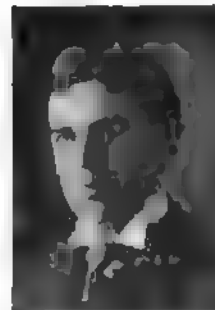
Taylor, N. Earle.—Clerk Pilot Garage & Supply Co., Worcester, Mass.

Taylor, Ted.—South Park St., Streator, Ill. Garage.

Taylor Trunk Co., C. A.—39 Randolph St., Chicago, Ill. Mfrs. automobile trunks.

Taylor, Wade A.—Niles, O. (Pope-Hartford.)

Teaboldt, Charles Roy.—Sec., Treas. and Asst. Mgr. Garford Motor Car Co. of New York. B. March 20, 1880, in Peru, Ind. Ed. High School at Clinton, Mich., and Cleary College at Ypsilanti, Mich. Director Garford Motor Car Co. of New York. Mem. A. C. A., New Jersey A. C. Res., 353 W. 117th St. Office, 1540 Broadway, New York City. Connected with automobile trade since 1903, with the



Packard Motor Car Co.; came to N. Y. Branch in fall of 1904; was with them until Aug. 1, 1907, when resigned to go With Garford Co.

Teagle, Frank H.—Pur. Agt. American Ball Bearing Co., Edgewater Park and L. S. and M. S. Ry., Cleveland, O.

Technical Literature Co., The.—220 Broadway, New York City. Pubs. the Technical Literature Monthly.

Technical World Magazine.—Pub. at Chicago, Ill

Technique Automobile, La.—Pub. at 49 quai des Grands-Augustins, Paris, France.

Tedge.—See Gate



Tee.—A pipe-fitting shaped like a letter T, used for joining three sections of a pipe

Teegarden & Putt.—Goshen, Ind. (Rauch and Lang.)

Teel Mfg. Co.—Medford, Mass. Mfrs. tool boxes, foot rests, robe rails, tire

cases, tire irons, automobile tops and trunk racks.

Tegan Bros. & Snyder.—236 Jefferson Ave., Detroit, Mich. Garage.

Telford.—A macadam-like pavement in which the bottom dressing consists of upright pointed stones. See Macadam.

Tell-tale.—An indicator used to show when a certain number of revolutions have been made by a machine. (2) On a vessel, a tiller-indicator.

Tell-tale Lights.—See Lights, Tell-tale.

Tempering.—A molecular modification which metals, alloys or other substances undergo when they are submitted to a sudden cooling. The result of tempering is the hardening of the articles treated and a modification of their properties of elasticity, resistance, etc. Tempering is practised on steel especially, but has likewise been applied to cast iron, which is hardened by a sudden cooling in a metallic box.

In the tempering of a tool, the latter is first hardened by heating to a temperature not exceeding that of "cherry-red," and then suddenly cooled by plunging it into cold water. If of proper quality, the steel should now be so hard as to scratch glass. If it be then cautiously heated, it will gradually be rendered softer and less brittle. By stopping the heating at the proper moment, and again cooling by water, the tool may be left with the requisite temper for the purpose desired. To enable this to be judged, a portion of the tool is carefully brightened after hardening. As the metal is heated, a succession of tints appear on the surface of the metal. These tints change as the temperature rises, and indicate with sufficient accuracy for practical purposes the exact moment when the heating must be stopped. The tints may be classified as in the following table, which also gives the temperature attained, and the principal tools for which each temperature is requisite:

Colors.	Temp. Fahr.	Tools.
Pale straw.	430°	Certain tools for cutting metal.
Darker straw....	440° to 470°	Metal - working tools cold chisels, and wood-working tools
Brownish yellow....	500°	Plane - irons, chipping chisels and other tools subject to shock or percussion.
Light purple....	530°	Springs.
Dark purple	570°	Saws.

Tempering has been applied to glass for the production of "tempered glass."

By extension of the word, the term "mass-tempering" is applied to an operation of "cementation" which consists in superficially "steeling" iron objects by heating them in a tight iron box in contact with charcoal, horn or burned leather, prussiate of potash, etc.

Tempering, Mass.—See Tempering.

Template, or Templet.—A mould or pattern, usually of sheet-iron or wood, used to indicate the outline or form to be given to a piece of work. The exact form of a template is obtained by careful measurements taken from working drawings. The form of the apparatus used in sheet-metal working is sometimes called a "break."

Temple Auto Co.—Temple, Tex. (Holman, Rapid).

Temple Auto Co., Ralph.—1219-1221 Michigan Ave., Chicago, Ill. (Rapid, National, Jackson, Pullman, Temple, Marvel.)

Temple, Geo. E.—Designer, Bay State Auto Co., 112 Norway St., Boston, Mass.

Temple, M. D.—Pres. Temple Pump Co., 15th St. and 15th Pl., near Canal St., Chicago, Ill.

Temple Press, Ltd.—7 Rosebery Ave., London, E. C., England. Publishers maps.

Temple Pump Co., The.—15th St. and 15th Pl., near Canal St., Chicago, Ill. Mfrs. single, double and 4-cylinder gasoline, stationary, portable and traction engines. Cap. \$150,000. Surplus, \$66,000. Est. 1853. M. D. Temple, Pres.; T. R. Fleming, Treas. and Mgr.; M. J. Miksch, Vice-Pres.; C. P. Miller, Sec.

Temple, T. W.—118 S. Main St., McPherson, Kan. Garage.

Temple, William Chase.—Retired. B. Starke, Bradford Co., Florida, Dec. 28, 1862. Ed. Delaware State Normal University, class '79, graduated in June,

1879, class valedictorian. Director Pittsburgh & Washington Coal Co., Rex Carbon Coal Co., Davison Lumber Co., Ltd., Atlas Mining Co., Point Loma Chemical Co. Mem. A. C. A. (first Life Member), A. C. Pittsburgh (ex-pres. and first Life Member), Duquesne of Pittsburgh, Cuyamaca, and Country of San Diego, Cal. Res. Point Loma, Cal., Pittsburgh, Pa., and Winter Park, Fla. Used first car 1899. Used seventeen cars, domestic and imported, in eight years, '99 to '07. Recreations: Golf and automobiling.



Templeton, D. F.—Montgomery House, Morristown, Pa. (Maxwell.)

Tenacity.—See Tensile Strength

Tench, F. M.—Vice-Pres. New Amsterdam Motor Co., 152 W. 56th St., New York City.

Ten Eyck, F. E.—Pres. Leather & Brass Mfg. Co., 24-26 E. Genesee St., Auburn, N. Y.

Tennant Motor Ltd.—1449 Michigan Ave., Chicago, Ill. (Peerless, Mercedes.)

Tenon.—A projection of rectangular cross-section at the end of a piece of timber to be inserted in a mortise in another piece of timber. See Mortise.

Tensile Strain.—A strain consisting of an elongation produced in a piece of material by a pull or tensile stress.

Tensile Strength.—The cohesive power by which a material resists an attempt to pull it apart in the direction of its fibers. This bears no relation to its capacity for resisting compression. Cast iron, for example, which has a comparatively low tensile strength, say of 30,000 pounds, requires a force of 100,000 pounds or more to the square inch to crush it.

Tensile Stress.—A force which tends to elongate a body.

Tension.—A system of forces tending to draw asunder the parts of a body combined with an equal and opposite system of resisting forces of cohesion holding the parts of the body together. (2) The condition or state of a body when acted upon by such forces. (3) The expansive force of a gas or vapor.

Tension, High.—See High Tension.

Tension-rod.—A stay or tie-rod in a truss or structure which connects opposite parts and prevents them from spreading asunder. A tie-rod.

Tension-roller.—A tightening-pulley, as for a belt. See Pulley, Jockey.

Tenvoorde, J. H.—Minneapolis, Minn. (Deere.)

Termaat & Monahan Co.—Oshkosh, Wis. Mfrs. gasoline marine motors.

Terminal.—The clamping device, usually a screw, at each end of a battery used for connecting it to the wires which complete the circuit. See Binding Screw.

Terminal Holder Specialty Co., The.—1251 Michigan Ave., Chicago, Ill. Mfrs. wire terminals.

Terre Haute Automobile Club.—Terre Haute, Ind. John S. Cox, Sec.

Terre Haute Carriage & Body Co.—101 Wabash Ave., Terre Haute, Ind. Mfrs. wooden and metallic bodies.

Terriere, H. W.—Pres. Chicago Vulcanizing Co., 1461-1463 Michigan Ave., Chicago, Ill.

Terrill, L. A.—Designer Commercial Truck Co., of America, 1222 Arcade St., Philadelphia, Pa.

Terrot et Cie.—Dijon, France. Mfrs. motorcycles.

Terry, Chas. A.—Sec. and Treas. Cooper Hewitt Electric Co., 111 Broadway, New York City.

Terry, Charles Thaddeus.—Lawyer. B. Albany, N. Y., Sept. 16, 1867. Ed. Williams College, '89; Columbia Law School, '93; New York Law School 2 years; student History, Economics, Literature, University of Berlin. Admitted to bar, 1893; prize lecturer on equity and code pleading and practice, 1893-5. Lecturer, 1897-1902; professor law since 1902, Columbia Law School. Mem. Phi Beta Kappa, Bar Association of N. Y., N. Y. Law Inst., Albany Society. Clubs: University, Lawyers, Republican, Phi Delta Phi (Pres.), Phi Delta Theta (Pres.). Counsel National Association of Automobile Manufacturers, Chairman Legislative Committee and Counsel American Automobile Association. As Chairman of the A. A. A. Legislative Board he prepared the Federal automobile bill, introduced in the 59th Congress, and again in the 60th Congress, where it is still pending. Res., 23 E. 77th St., Office, 100 Broadway, New York City.

Terwilliger & Co., Wm. B.—32 Division St., Amsterdam, N. Y. Mfrs. steam automobiles.

Terwilliger-Stone Leather Co.—210 New Jersey Railroad Ave., Newark, N. J. Mfrs. leather.

Test, Chas. E.—Pres. National Motor Vehicle Co., E. 22nd St., Indianapolis, Ind.

Testard, H. A.—341 St. Charles St., New Orleans, La. (Buick, Pope-Toledo, Cadillac.)

Teste, E.—18 cité Lemiére, Belleville, Paris, France. Mfr. horns.

Teste, Georges Robert.—144 Rue de Courcelles, Paris. Born at Pacy-sur-Eure, March 30, 1874. Dealer, representing the Panhard-Levassor, Mercedes, Renault and other cars. Formerly foreman in the de Dion-Bouton works. Tricycle racer between 1896 and 1901. Business Mgr. of an agency of the Panhard cars from 1901 to 1904. At present head of the Teste establishment.

Tetrahedral.—A term applied to the hull of a boat in which the bottom, the two sides, and the deck are all roughly triangular with their points together at the bow.

Teudeloff Halloria Motorfahrzeugwerke.—Halle-am-Saal, Germany. Mfrs. Halloria motorcycles.

Teves & Hendricks.—411 Berry St., Brooklyn, N. Y. (Smith.)

Tew, B. T.—Hempstead, L. I., N. Y. (Haynes.)

Texas Automobile Co.—San Antonio, Tex. Garage.

Texas Auto Transit Co.—San Antonio, Tex. (Rapid.)

Texas Co., The.—Chicago, Ill. Mfrs. eye shields.

Thatcher & Sons.—Mattoon, Ill. Repairing.

Thayer, F. E.—1028 S. Main St., Los Angeles, Cal. (Darracq.)

Thedford's Garage.—315 W. 96th St., New York City. Rental service.

Theim Mfg. Co.—Minneapolis, Minn. Mfrs. gasoline automobile motors.

Therm.—The amount of heat required to raise one gramme of water at its maximum density one degree centigrade. The same as "small calorie." See Calorie.

Thermal Unit.—See Calorie.

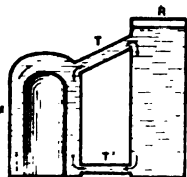
Thermic Energy.—See Energy, Thermic.

Thermite.—A mixture of aluminum powder and ferric oxide used in Goldschmidt's process of reducing metals, and employed also in the soldering of iron pipes etc., where a very high temperature is required.

Thermo-chemistry.—That branch of chemistry which deals with the measurement of the heat evolved or absorbed in reactions, and which applies the result of such measurements to the solution of various chemical problems.

Thermo-electricity.—That part of general electricity which deals with the direct transformation of heat into electricity or inversely.

Thermo-siphon.—The cooling of motors is assured in certain types of automobiles, not by an ordinary pump forcing the water to circulate from the motor to the radiator, but simply by a "thermo-siphon." In this arrangement, the top and bottom of the water jacket which surrounds the motor are connected by many pipes to a large honey-comb or gilled-tube radiator. The water circulates then simply by a difference



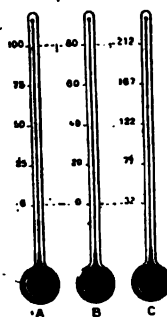
in density, the warmest water reaching the top of the cylinder and then the radiator, and the water, relatively colder, owing to its stay in the radiator, naturally descending to the lower part of the cylinder. In the figure, M represents the cylinder of the motor; R, the thermo-siphon; T, the hot-water outlet-tube; T₁, the cooled water inlet tube.

Thermodynamic Function.—See Entropy.

Thermodynamics.—The investigation of the relations between heat and other forms of energy.

Thermometer.—An instrument for measuring the temperature of bodies,

or the degree of intensity of their sensible heat. In Europe there are three different kinds of thermometers: (1) Fahrenheit's, which is used chiefly in Great Britain, Holland and North America, the freezing-point on which is at 32°, and the boiling point 212°; (2) Réaumur's, which was that chiefly used in France before the Revolution, and now generally used in Spain,



and in some other continental states, and the freezing point, or zero, on which is 0°, and the boiling point 80°; (3) The Celsius, or Centigrade thermometer, now almost universally used throughout France, and in the northern and middle kingdoms or Europe, and the zero or freezing-point on which is 0°, and boiling-point 100°.

To convert degrees, Centigrade or Réaumur, into degrees Fahrenheit:

Let F = Number of Fahrenheit degrees.

C = " " Centigrade "

R = " " Réaumur "

$$F = \frac{9C}{5} + 32; \quad F = \frac{9R}{4} + 32;$$

$$C = \frac{5(F - 32)}{9} \quad R = \frac{4(F - 32)}{9}$$

Thermostat.—An automatic apparatus for controlling and regulating temperature. Thermostat regulators are employed on several steam-cars to control the by-pass valve as well as to regulate the supply of gasoline to the burner. When the steam is superheated too much the apparatus shuts off the fire, which it opens again when cooler steam reaches it; the cooler steam meaning that the water (under the action of pump and by-pass) is nearer the thermostat, so that more fire is needed to convert it into steam.

Thery, Leon.—10 Rue Chaligny, Paris. Born at Paris, April 16, 1879. After having taken part in almost all of the mile, kilometre, etc., hill races, disputed at Nice, Gaillon, Trouville, etc., Thery, in 1903, entered into the employ of Richard Brasier, for whom he won the French elimination tests, and then the Bennett cup races two years in succession, in 1904 at Taunus, and in 1905 at Auvergne.

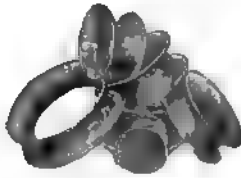
Theuveny.—80 rue Taitbout, Paris, France. Publishers maps.

Thevenin Frères, Seguin et cie.—116 bvd. Richard-Lenoir, Paris, France. Mfrs. lubricators.

Thibault, E. J.—Mgr. Oakland Branch Geo. P. Moore Co., Inc., 231 Twelfth St., Oakland, Cal.

Thiesen, Fred.—Chilton, Wis. (Jewel.)

Thimble.—An iron ring, with an external groove, worked into a rope or fabric for the purpose of receiving another rope; a large eyelet (see figure). (2) A sleeve or tube



through which a bolt passes, and which may act as a stay.

Thimble-joint.—A sleeve joint with an interior packing to keep the joints of pipes tight during expansion and contraction.

Thirty-first St. Garage.—316 Thirty-first St., Chicago, Ill. Garage.

35 Per Cent. Auto Supply Co.—83 Chambers St., New York City. Est. 1905. Complete line of automobile supplies. A. B. Norwalk, Pres., Gen. Mgr. and Treas.; H. Saxon, Sec. Branch, 1663 Broadway, New York City.

Tholen Bros.—304 Shawnee St., Leavenworth, Kan. (Cadillac.)

Thomas & Bros., G. P.—Batavia, N. Y. (Pierce, Waltham.)

Thomas & Lowe Machinery Co.—Sabin and West Exchange Sts., Providence, R. I. (Autocar, Pope-Toledo.)

Thomas & Tolman Auto Co.—1828 L St., N. W. Washington, D. C. (Pullman.)

Thomas et Cie, Auguste.—58 quai des Charbonnages, Brussels, Belgium. Mfrs. springs.

Thomas Auto-Bi Co.—1443 Niagara St., Buffalo, N. Y. Mfrs. motorcycles

Thomas Brass & Iron Co.—Waukegan, Ill. Mfrs. pipe, brass fittings.

Thomas, Edwin Lozier.—Vice-Pres. E. R. Thomas Motor Co. B. Evansville, Ind., Nov. 28, 1880. Ed. Upper Canada College, Toronto, Ont. Director E. R. Thomas Motor Co., E. R. Thomas Realty Co. Mem. A. C. Buffalo, Country C. (Buffalo). Res. 506 Delaware Ave. Office 1200 Niagara St., Buffalo, N. Y.



In the trade since Sept., 1900. Recreation: Touring.

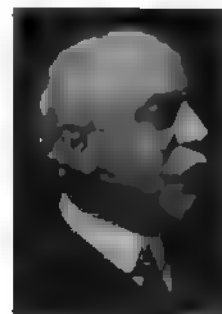
Thomas Detroit Co., E. R.—2704-2718 Jefferson Ave., Detroit, Mich. Makers of Thomas-Detroit car, first marketed in

1906. Two different models made since. Cap. \$300,000. Hugh Chalmers, Pres.; H. E. Coffin, Vice-Pres. and Designer; R. D. Chapin, Treas. and Gen. Mgr.; J. J. Brady, 2d Vice-Pres. and Factory Mgr.; F. O. Bezner, Sec. and Purch. Agt.; J. G. Utz, Designer.

Thomas, E. R.—Pres. Allen-Kingston Motor Car Co., 3 W. 44th St., New York City.

Thomas, E. P.—Mgr. Belting Dept. Republic Belting & Supply Co., 1616 W. Third St., Cleveland, O.

Thomas, Edwin Ross.—Manufacturer and capitalist. B. Webster, W. Moreland Co., Pa., 1850. Ed. high school, Evansville, Ind., Duff's College, Pittsburg, Pa. Pres. E. R. Thomas Motor Co., E. R. Thomas Realty Co., and International Motor Cab Co. Director Central National Bank of Buffalo, American Savings Bank of Buffalo, Buffalo Copper & Brass Rolling Mill, L. I. Motor Parkway, Mem.



clubs: A. C. A., A. C. Buffalo, American Motor League, Buffalo Launch, Buffalo Motor Boat, Royal Canadian Yacht, Buffalo, Ellicott, Buffalo Country, Buffalo Park. Res. 125 North St., Office 1200 Niagara St., Buffalo, N. Y. In the trade since 1902. Used first car 1902. An amateur yachtsman, experimenting with automobile type motor boats, built "Flo Flo," 60 hp., and "Butterfly," 300 hp. Recreations: Yachting, golf and fishing.

Thomas, F. C.—Pomona, Cal. (Maxwell.)

Thomas, H. J.—Designer Reo Motor Car Co., Lansing, Mich.

Thomas, J. Clarence.—Beaton and Collins St., Corsicana, Tex. Garage.

Thomas, J. R.—1208 Connecticut Ave., Washington, D. C. Garage. (Maxwell)

Thomas Motor Co., E. R.—1200 Niagara St., Buffalo, N. Y. Makers of the Thomas Flyer, Town car and Motorcab; first automobile marketed in 1898. Cap. \$500,000; surplus \$750,000. E. R. Thomas, Pres.; E. L. Thomas, Treas.; J. M. Edsall, Sec.; Gustave Chedru and Howard E. Coffin, Designers; K. L. McDonald, Pur. Agent; M. B. Hatch, Sales Mgr.; F. L. Faurote, Advt. Mgr.

Following are the principal events and the records in which the Thomas cars have figured: World's non-stop record, 507 hours, 29 minutes. Perfect score in the 1906 Glidden tour. Two perfect scores in the 1907 Glidden tour. Road record, Buffalo to Rochester, 68 miles, in

1 hour, 32 minutes and 45 seconds. Stock touring car record for 5 miles, standing start, in 4:55; 1 mile in 57-2-5 seconds at Atlantic Beach; 1 mile, 55-4-5 seconds, Atlantic Beach. Lowered 50-mile stock touring car record, Hawthorne track, Chicago, to 1:06:19. Again lowered 50-mile world's record for stock touring cars, Point Breeze track, Philadelphia, 1:04:19 $\frac{1}{4}$. 1907.—June 1, E. L. Mathewson broke 50-mile record at Overland Park (Colo.) track; time, 55:43-4-5. July 4, Wildwood, N. J., won Free-for-all; open to cars listing \$3,500 and under; special mile, 120-hp. Thomas first; time, 44 seconds. Nov. 16, Thomas one of seven to finish with perfect score in 24-hour run of the New Jersey Auto and Motor Club; 22 entries. June 29, Brinker and Ralph Baird in Thomas runabout broke record from Denver to Colorado Springs in 1 hour, 59 minutes. May 30, Hood lowered record 2 hours and 13 minutes in winning the 100-mile National Championship on circular track at Bennings race course in Thomas sixty. May 30, W. C. Hood won 100-mile race at Bennings track, Washington, in Thomas car. July 13, Won Chicago 24-hour endurance race on the Harlem track. C. A. Coey driving distance, 846 miles; eighteen cars entered. July 4, Peoria, Ill., 6-hour race; Coey and Thomas first; ran 269 miles. Aug. 6, Atlantic City; Montague Roberts driving 120-hp. Thomas; free-for-all; 1 mile, 40-1-5 seconds. Aug. 9, 24-hour race on the Brighton Beach track; winner, Thomas, driven alternately by Roberts and B. McIlried; distance traveled, 997 miles. Aug. 25, Olympic Club, 5 miles, free-for-all; first, Thomas 70 runabout, driven by Bert Dingley, and third, Thomas 70 runabout, Roy Rehm; time, 5 minutes, 25-4-5 seconds. Sept. 15, Cincinnati, O.; 6-hour endurance race; won by J. Sharp in Thomas car. Sept. 14, Sacramento, Cal.; 10-mile race won by Bert Dingley in Thomas Speedway Flyer; time, 11:15. Nov. 9, Thomas-Detroit broke record of run of 135 miles, from Los Angeles to San Diego, in 4 hours, 39 minutes. May 7, Thomas one of four to make perfect score in run of the Motor Club of Harrisburg. Feb. 12, 1908, started in New York-Paris race.

Agents and dealers: R. S. Austin, El Paso, Tex. Auto Storage & Trading Co., Albany, N. Y. Auto Shop Co., 731 Vincent Ave., Cleveand, O. Barclay Auto Co., 246 3d Ave. S., Minneapolis, Minn. Coey & Co., C. A., 1424 Michigan Ave., Chicago, Ill. Crescent City Auto Co., 217 S. Rampart St., New Orleans, La.; Clinton, L. R., Binghamton, N. Y. Davis Auto Co., Providence, R. I. Dietrich Motor Car Co., 24 N. 10th St., Allentown, Pa. Diebold Auto Co., Canton,

O. Dowling, J. A., 26 Forest Ave., Portland, Me. Filiatrault, E. J., Duluth, Minn. Grant Bros. Auto Co., 742 Woodward Ave., Detroit, Mich. Gladke, Morris, 101 E. Water St., Elmira, N. Y. Greenlease, Robt. C., 1316 E. 15th St., Kansas City, Mo. Gould & Sons, A. R., 415 Linden St., Scranton, Pa. Groves & Co., H. B., Sioux City, Ia. Harrington, John S., 36 Central St., Worcester, Mass. Hart, A. V., 30 Carlton St., Rochester, N. Y. Hought Co., Harry S., 1896 Broadway, New York City. Hought Co., Harry S., 139 S. Broad St., Philadelphia, Pa. Hought Co., Harry S., 213 Clinton Ave., Newark, N. J. Iowa Auto & Supply Co., Des Moines, Ia. Joyce Auto Co., F. G., 705 Chestnut St., Chattanooga, Tenn. Kirk Bros. Auto Co., 915 Jefferson Ave., Toledo, O. Keats Auto Co., H. L., 80 7th St., Portland, Ore. Keeler Co., E., Williamsport, Pa. Lucas Co., W. P., Oil City, Pa. Maynard, W. A., 68 Gilbert St., New Haven, Conn. Murphy Bros., Erie, Pa. Memphis Auto Co., Memphis, Tenn. Mason's Carriage Co., Davenport, Ia. Motor Car Co., Mt. Royal St., Baltimore, Md. Motor Car Co., 1314 New York Ave., Washington, D. C. Mohler & De Gress, Mexico City, Mex. Mathewson Auto Co., 1624 Broadway, Denver, Colo. Penn Auto Co., 31 Wood St., Reading, Pa. Park Auto Co., 4432 Olive St., St. Louis, Mo. Pioneer Auto Co., 901 Golden Gate Ave., San Francisco, Cal. Palace Auto Station Co., 348 Trumbull St., Hartford, Conn. Pittsburg Auto Co., 2213 Farmers' Bank Bldg., Pittsburg, Pa. Smith, C. K., New London, Conn. Smith, J. A., Saratoga Springs, N. Y. Sontag, F. A., Houston, Tex. Speers, M. H., Pine Bluff, Ark. Utica Motor Car Co., 333 Bleecker St., Utica, N. Y. Union Auto Garage Co., Akron, O. Van Benschoten, John, 14 Catherine St., Poughkeepsie, N. Y. Warner, Grove E., 438 S. Salina St., Syracuse, N. Y. Wasatch Auto Co., Salt Lake City, Utah. Western Motor Car Co., 415 S. Hill St., Los Angeles, Cal. Wheelan, J. D., care Dallas Auto Co., Dallas, Tex. Whitten, C. E., Lynn, Mass. Whitten-Gilmore Co., 5 Park Sq., Boston, Mass. Wulf, W. J., San Juan, P. R.

Thomas, R. H.—Supt. Citizens' Motor Car Co., N. E. cor. Seventh and Main Sts., Cincinnati, O.

Thomas, Thos. H.—Treas. Locomobile Co., 400 Newbury St., Boston, Mass.

Thomas, Ulysses S.—Sec. Centaur Motor Co., 53-61 Franklin St., Buffalo, N. Y.

Thomas Wagon Co., The.—Vernon, N. J. Mfrs. gasoline commercial automobiles.

Thomas, W. K.—Head of Sales and Adv. Dept., Cassidy-Fairbank Mfg. Co., 6106-6130 La Salle St., Chicago, Ill.

Thomasma, H.—Vice-Pres. Auto Rail

& Equipment Co., 113 Michigan Trust Bldg., Grand Rapids, Mich.

Thomasville Iron Works.—331 Jackson St., Thomasville, Ga. (Reo, Ford.)

Thomet et Cie., A.—125 rue du Theatre, Paris, France. Mfrs. circulating pumps.

Thomey-Cavalleris, E.—Pres. and Treas. Acetylene Gas Illuminating Co., 105 Walker St., New York City.

Thomey-Cavalleris, K. L.—Vice-Pres. Acetylene Gas Illuminating Co., 105 Walker St., New York City.

Thompson & Co.—State and Whitaker Sts., Savannah, Ga. (Maxwell, Reo, Rambler.)

Thompson & Co., T. W.—28 Deptford Bridge, Greenwich, England. Mfrs. storage batteries.

Thompson & Lipcomb.—Washington St., Lacon, Ill. (Jackson.)

Thompson, Alfred.—Pres. Erie Stamping & Mfg. Co., 646 W. 12th St., Erie, Pa.

Thompson, Alvah M.—Pres. Metropolitan Automobile Co., Sommerville, Mass.

Thompson, Arthur.—Vice-Pres. Erie Stamping & Mfg. Co., 646 W. 12th St., Erie, Pa.

Thompson Auto Co.—1924 Westminster St., Providence, R. I. Garage.

Thompson Automobile Co., Andrew C.—413 Park Ave., Plainfield, N. J. Garage.

Thompson, C. E.—Gen. Mgr. Cleveland Cap Screw Co., 2216 Clarkwood Rd., Cleveland, O.

Thompson Co., E. J.—5917-5919 Penn Ave., Pittsburgh, Pa. Mfrs. wooden and metallic bodies.

Thompson, E. R.—Automobile editor Journal of Commerce, New York City.

Thompson, F. H.—36-38 Elm St., Portland, Me. Mfrs. machinery spring.

Thompson, Geo. Lee.—Pres. The Autolight & Motor Supply Co., Inc., 506-8 N. Broad St., Philadelphia, Pa.

Thompson, J. E.—Supt. Repair Dept., F. A. Bryson, 5, 7, 9 Perry St., E., Savannah, Ga.

Thompson, R. C.—Asst. Treas. and Mgr. Globe Optical Co., 403 Washington St., Boston, Mass.

Thompson, T. E.—Canastota, N. Y. (Maxwell.)

Thompson, Walther S.—Sec. Metropolitan Automobile Co., Sommerville, Mass.

Thompson's Chelsea Garage.—California Ave., Atlantic City, N. J. Garage.

Thomson Co., Robert.—254 Court St., Rochester, N. Y. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

Thordasen Electric Co.—153 S. Jefferson St., Chicago, Ill. Mfrs. spark coils.

Thorn, W. & F.—Raneleigh House, Lower Grosvenor Pl., London, S. W., England. Mfrs. bodies.

Thornhill Co., H. W.—Dallas, Tex. (Rapid.)

Thornhill, W. C.—Minneapolis, Minn. (Frayer-Miller, Reo.)

Thornycroft & Co., Ltd., John I.—Homefield, Chiswick, London, England. Mfrs. Thornycroft gasolene automobiles and steam commercial trucks.

Thorpe, B. E.—117 W. 16th St., San Francisco, Cal. (Jewel.)

Thorpe, Geo. B.—Sec. The Grant Mfg. & Machine Co., 90 Silliman St., Bridgeport, Conn.

Thorpe, R. E.—Los Angeles, Cal. Garage.

Thorpe, Ray P.—Sec. and Treas. Corbaley & Thorpe Auto Co., 443-449 Emerson St., Palo Alto, Cal.

Tnousand Island Boat & Engine Co.—Morristown, N. J. Mfrs. gasolene marine motors and motorboats.

Thrall, Frank R.—Treas. and Gen. Mgr. Waterman Marine Motor Co., 1506-1512 Fort St. West, Detroit, Mich.

Thrall, Geo.—Sec. and Treas. Detroit Screw Works, Riopelle and Franklin Sts., Detroit, Mich.

Thread.—A helical ridge around a screw. See Screw.

Three Rivers Furnace & Foundry Co.—Three Rivers, Mich. Mfrs. gray iron castings.

Three Square.—Three-sided, or triangular in section.

Three-throw Crank.—See Crank.

Throon & Sons, J. E.—Trenton, N. J. (Winton.)

Throop, B. M.—33 Walnut St., Geneva, O. Repairing.

Throop Perforating Co.—80 Terrace, Buffalo, N. Y. Mfrs. body irons, transmission gears, metal gear-wheels, machine works, perforated metal, and sprockets.

Throttle.—See Valve, Throttle.

Throttling.—Regulating the supply of steam in a steam-engine, or of gas in a gas or gasolene-motor, by means of a throttle-valve.

Throw.—The radial reach of a crank, cam or eccentric.

Throw, Crank.—See Crank and Throw.

Throw, Eccentric.—See Eccentric and Throw.

Thrust.—A stress between two bodies in contact, and particularly that along the axis of a rod or shaft.

Thrust-bearing.—See Bearing, Thrust.

Thrust-collar.—See Collar, Thrust.

Thrust-load.—A load which comes parallel to the shaft which the bearing supports. One at any other angle is partly radial and partly thrust.

Thumb-nut.—See Nut, Thumb.

Thumb-Screw.—See Screw, Thumb.

Thüringische Maschinen und Fahrradfabrik.—Mülhausen, Thuringia, Germany. Mfrs. motorcycles.

Thurlow, J. A.—10th and Delaware Sts., Wilmington, Del. (Queen.)

Thurston Mfg. Co., The.—356 E. 57th St., Chicago, Ill. Mfrs. spark plugs.

Thwart.—One of the transom planks which keep the sides of a boat asunder.

Thwartship.—See Athwartship.

Tibbetts, N. H.—Groveton, N. H. (Lambert.)

Tichenor, W. A.—Pres. Commercial Battery Co., 204-206 Michigan St., Chicago, Ill.

Tickler.—A small button or plug, which, in most carburetters, is situated at the top of the float-chamber, and upon which a pressure is exerted in order, through a plunger, to depress the float for the purpose of admitting a larger quantity of gasoline, so as to facilitate the starting of the motor. Such an operation is called "tickling" the carburetter.

Tidewater Automobile Club.—510 Atlantic Trust Bldg., Norfolk, Va. Frederick Lewis, Sec.

Tie-bar.—See Link, Drag.

Tie-rod.—A member (usually a thin rod) of a structure which exerts a tensile force between two other parts. (2) The same as drag-link, q. v.

Tiel & Co., Geo.—413 Arch St., Philadelphia, Pa. Mfrs. cloth and carpet trimmings.

Tierney, S. P., & Stantial Co.—Stoneham, Mass. Garage.

Tierney, S. P.—147 Main St., Springfield, Mass. (Cameron.)

Tiffany, Calvin H.—Willimantic, Conn. Garage.

Tiffin Cycle & Auto Co.—Tiffin, O. (Pope-Waverley.)

Tifft, J. E.—Vice-Pres. Auto Supply & Storage Co., 1416 Madison Ave., Baltimore, Md.

Tightening Pulley.—See Pulley, Jockey.

Tilden, Philip S.—Sec. Franklin H. Kalbfleisch Co., Broadway and 16th St., New York City.

Tiley-Pratt Co., The.—Essex, Conn. Mfrs. nipples, power-driven tire pumps.

Tiller.—A beam or iron bar fitted into the head of the rudder, and by means of which the latter is moved. (2) On a motor-car, a steering-lever fulcrumed at the center of the dash or footboard, and moving laterally to effect the steering.

Timer.—A device, called also a "commutator," "circuit-breaker" and "contact-maker," designed to establish and break the primary or low tension current at the proper moment with relation to the posi-

tion of the piston within the cylinder.

The different kinds of timers or commutators employed are: "Touch-contact" or "make-and-break," "roller contact," "sliding contact," and "brush contact." The timer used on a four-cylinder motor usually consists of a fiber ring, in the inner circumference of which are fixed, at equal distances from each other, four hardened steel contact-points, which are individually connected by wires to separate units of the spark-coil, and thence through separate wires to the spark-plug in each cylinder. The fiber ring surrounds a shaft rotated by bevel-gear from the cam-shaft, between the pairs of cylinders. Attached to the shaft, inside the ring, is an arm having at its extremity a hardened steel contact-roller, which, as the shaft revolves, passes over each of the contact-points in the ring. As the roller passes over these points, the contact is made and broken, and lines of force are agitated in each of the spark-coil units, creating an induced current in the secondary winding. (2) A form of stop-watch for indicating only relative time, as in timing a race.

Timer, Brush-contact.—See Timer.

Timer, Make-and-break.—See Timer.

Timer, Roller-contact.—See Timer.

Timer, Sliding-contact.—See Timer.

Timer, Touch-contact.—See Timer.

Times Square Auto Co.—1599-1601 Broadway, New York City. (Second-hand cars.) Est. 1904. Cap. \$10,000. Morris Froehlich, Pres.; Jesse Froehlich, Treas. and Sec.; Oscar Weingarten, Vice-Pres.

Timing.—A term applied to the operation of advancing and retarding the spark in an ignition system. (2) The regulation of the parts of a mechanism so that all the motions shall take place in due order and time.

Timing-gear.—See Gear, Timing.

Timing-lever.—The same as ignition-lever. See Lever, Ignition.

Timken, Henry.—Pres. Timken Roller Bearing Axle Co., Canton, O.

Timken, H. H.—Vice-Pres. Timken Roller Bearing Axle Co., Canton, O.

Timken Roller Bearing Axle Co.—Canton, O. Mfrs. roller bearings and roller bearing axles. Henry Timken, Pres.; H. H. Timken, Vice-Pres.; W. R. Timken, Sec. and Treas.; E. W. Lewis, Asst. Sec. and Sales Mgr.; A. R. Demory, Gen. Supt.; H. W. Alden, Mechanical Engineer; G. C. Kimbark, Cashier. Branches: New York, 219 W. 46th St.; Chicago, 429 Wabash Ave.

Timken, W. R.—Sec. and Treas. Timken Roller Bearing Axle Co., Canton, O.



Timmins & Butler.—286 Ellicott St., Buffalo, N. Y. Garage.

Timperley, Chas.—14 Mary Ann St., Birmingham, England. Mfrs. make-and-break plugs.

Tin.—A white metallic body, the most fusible of ordinary metals. its melting point being 442° F., or 228° C. Pure tin is perhaps of all substances that which produces the least friction in iron, but, for bearings, its softness has prevented it from being very extensively employed in a pure state. When pressed upon the rubbing surface it yields and becomes extended in the direction of the length of the pillow. Alloyed with copper, it gives bronze, and with lead, various solders for plumbers and tinsmiths. Thin sheets of soft iron covered with tin by dipping are termed "tin-plates." In contact with air, while in fusion, it oxidizes more or less completely, and forms stannous and stannic-oxides, floating as a slag or scoria on the metal itself. Oxide of tin constitutes "tin putty," which is used for polishing metals.

Tin-foil.—Tin or a tin-like alloy rolled into very thin sheets.

Tin-plate.—See Tin.

Tin-putty.—See Tin.

Tincher Motor Car Co.—South Bend, Ind. Mfrs. gasoline automobiles.

Tindel, Adam.—Pres. and Treas. Tindel-Morris Co., Eddystone, Pa.

Tindel-Morris Co.—Eddystone, Pa. Mfrs. automobile crank shafts and machinery for manufacturing automobile shafts. Est. 1862. Adam Tindel, Pres. and Treas.; L. I. Morris, Vice-Pres.; L. W. Gruber, Sec.

Tingley & Co., Chas. O.—Rahway, N. J. Mfrs. tire cement, tire patches and tire plugs.

Tingue Mfg. Co.—Seymour, Conn. Mfrs. cloth and carpet trimmings.

Tioga Auto Co.—Broad and Tioga Sts., Philadelphia, Pa. (National.)

Tip.—See Burner.

Tippecanoe Auto Co.—112-114 N. 5th St., Lafayette, Ind. (Reo, Jackson, Overland.)

Tippel, Alfred Josef.—XIII Linzerstrasse, Vienna, Austria. (Lambert.)

Tippitt, J. E.—Vice-Pres. Auto Supply & Storage Co., 1416 Madison Ave., Baltimore, Md.

Tire.—A band or rim around the periphery of a vehicle-wheel, usually of iron, steel or rubber, and sometimes of leather, and more rarely of paper or wood. All motor-vehicles use tires of rubber, with the twofold object of obtaining a desirable spring effect and securing the requisite adhesion to the road. There are two varieties of rubber tire in use for every kind of vehicle except cycles, viz., the solid and the inflatable pneumatic tire. At present pneumatic tires

are almost universally employed on motor-cars, while solid tires are found only on electric vehicles designed for use on city streets, or on trucks and the heavier types of passenger and commercial vehicles. The solid tire is sometimes provided with small hollows or tunnels let into it lengthwise, when it is more appropriately called a "cushion" or "cellular" tire. The shape of solid tires varies, some having a flat tread and nearly straight sides, others a curved tread conforming somewhat to a half circle, others, called "sectional," with tread surface composed of a number of projections from a rubber strip, which can be moulded in as many sections as desired, etc. See Tire, Pneumatic.

Tire-band.—A band for protecting a tire or for lacing over an injured portion of it.

Tire-bolt.—See Bolt, Tire.

Tire-brake.—See Brake, Tire.

Tire, Cellular.—See Tire.

Tire, Clincher.—A type of rubber tire which is held on the rim by the pressure of the air against its edge.

Tire-cover.—A casing of leather, rubber, etc., for holding pneumatic tires. It is usually fastened to the body and foot-board by irons.

Tire-creeping.—See Creeping.

Tire, Cushion.—A tire similar to the solid tire, except that it is provided with cellular or tubular openings with a view to producing greater resiliency than is possible with a solid tire.

Tire, Detachable.—A double-tube pneumatic tire, which is removable from the rim.

Tire-gaiter.—The same as tire-sleeve.

Tire, Inflation.—Naturally, tires should be inflated proportionally to the weight that they have to carry, but in every case amply. An insufficiently inflated tire becomes very quickly ruined through rim cutting or sheering between the ground and the metallic felly.

All tire makers advise that pneumatic tires be always kept at a constant pressure. In fact, if a tire be too "soft," the canvas is apt to rupture, while if it is too much inflated it bursts in consequence of a diminution in the resistance of the canvas and the increase of pressure resulting from the heat engendered by the revolution of the wheel.

In order to find out whether the exact pressure has been reached, it is absolutely necessary to have an air-pump provided with an excellent gauge. The proper dimensions and air-pressures of double-tube tires, as given by Michelin, are:

For loads of from 350 to a maximum of 600 pounds per wheel, 2½ inches in diameter, inflation pressure, 50 pounds.

For loads of from 440 to 660 pounds

per wheel, $3\frac{1}{2}$ inches diameter, inflation, 70 pounds.

For loads of from 550 to 990 pounds per wheel, $3\frac{1}{2}$ inches in diameter, inflation, 71 to 78 pounds.

For loads of from 660 to 1,140 pounds per wheel, 4 inches diameter, inflation, 71 to 78 pounds.

For loads of from 880 to 1,320 pounds per wheel, $4\frac{3}{4}$ inches diameter, inflation, 71 to 78 pounds.

For loads of from 1,100 to 1,650 pounds per wheel, $5\frac{1}{2}$ inches diameter, inflation, 71 to 85 pounds.

In further elaboration of the subject, it may be said that the proper inflation of a tire may be judged by the extent to which it flattens when running. When fully loaded the tire should never flatten more than two-fifths of an inch, and even on the level streets of a town, never more than three-fifths of an inch.

Tire-lever.—See Lever, Tire.—

Tire, Paper.—An automobile tire built up in one piece on the wheel by wrapping gummed paper about the latter to the desired thickness, and then bolting the channel-flanges to the sides. The resilience may be increased by inserting a band or cushion of rubber between the rim and the paper tire

Tire-patch.—See Patch.

Tire, Pinching of.—See Pinching.

Tire, Pneumatic.—There are two varieties of the pneumatic tire, the single and the double-tube. The first, in all its forms, consists of an inner or air-tube, constructed of thin rubber inclosed in an outer case or "shoe" made of strong fabric and a tougher or denser kind of rubber. The single-tube tire differs from the double-tube in the fact that the inner or air-tube is vulcanized to the outer tube, making the two tubes really one. The double-tube tire is the one most commonly used on motor-cars, because of the several advantages it presents, such, for example, as its immunity from "creeping," and from rolling off, like the single-tube tire.

The pneumatic tire, however, has two great disadvantages: (1) Its rapid wear and, consequently, its enhanced cost; and (2), the ease with which it bursts or is punctured. Some inventors have tried to correct this last defect by devising what are called "non-puncturing" tires, but the results obtained have been at the expense of great weight and an increased cost. Pneumatic tires offer the great inconvenience of side-slipping or "skidding" on soft, greasy, wet or even very dusty surfaces. This can be remedied more or less by the use of "non-skids," which are usually formed of a band of chrome leather cemented to the shoe and studded with rivets, which grip the surface and prevent lat-

eral displacement. These are applied to the rear wheels, and are effective in a certain measure only. See Skidding and Non-skid.

Tire-protector.—A supplementary tread composed of leather or other suitable material for protecting a pneumatic tire.

Tire-pump.—See Pump, Tire.

Tire-rim.—See Rim.

Tire-shoe.—The casing of a pneumatic tire.

Tire-sleeve.—A sleeve, called also a "gaiter," for protecting or repairing an injured portion of a pneumatic tire.

Tire, Solid.—A tire composed of a solid band of rubber. See Tire.

Tire-tank.—See Tank, Tire.

Tire-tool.—A tool, called also a "tire-iron," for rolling a tire-shoe on or off the rim.

Tire-valve.—See Valve, Tire.

Tires, Leather.—During the last few years considerable use has been made of leather for tires owing to several important discoveries in rendering the material resistant to water. The most popular method of preparing rawhide for tire-making is by the chrome process (see Chrome, Leather), the details of which are not known, but the result of which is a leather possessing much of the softness and strength of rawhide, while being nearly waterproof. Although the principal use of leather in tire-making is in covers for ordinary rubber tires, not only pneumatics, but solid tires are now being made of the material.

Tires, Metric.—American equivalents of:

Metric Sizes.	Approx. Size in Inches.
650x 65	26x2 $\frac{3}{4}$
700x 65	28x2 $\frac{1}{2}$
750x 65	30x2 $\frac{1}{2}$
800x 65	32x2 $\frac{1}{2}$
830x 65	33x2 $\frac{1}{2}$
860x 65	34x2 $\frac{1}{2}$
700x 85	28x3 $\frac{1}{4}$
750x 85	30x3 $\frac{1}{4}$
800x 85	32x3 $\frac{1}{4}$
860x 85	34x3 $\frac{1}{4}$
810x 90	32x3 $\frac{1}{4}$
840x 90	32x3 $\frac{1}{2}$
870x 90	34x3 $\frac{1}{2}$
910x 90	36x3 $\frac{1}{2}$
960x 90	38x3 $\frac{1}{2}$
1010x 90	40x3 $\frac{1}{2}$
815x105	32x4
875x105	34x4
915x105	36x4
820x120	32x4 $\frac{1}{2}$ -5
850x120	33x4 $\frac{1}{4}$ -5
880x120	34x4 $\frac{1}{2}$ -5
920x120	36x4 $\frac{1}{4}$ -5
1020x120	40x4 $\frac{1}{2}$ -5
1080x120	42x4 $\frac{1}{4}$ -5

Tire Safety Device Co.—214 W. 124th St., New York City. Mfrs. tire valves.

Tirrill Gas Machine Lighting Co.—75 Fulton St., New York City. Mfrs. storage tanks.

Tischbein, Willy.—Pres. Continental Caoutchouc Co., 43 Warren St., 2100 Broadway, New York City.

Titanic Steel.—See Steel, Titanic.

Titanium.—A rare metal discovered by Klaproth in 1794. It is not known in a pure condition. It has been obtained containing 2 per cent. of carbon by heating an intimate mixture of carbon and titanium dioxide in an electric furnace. So obtained it is a very hard white metal, so hard as to scratch steel, and very light. Its purest ore is rutile. It is now used in the construction of aeroplanes. See Rutile.

Titchiner, C. E.—Binghamton, N. Y. Garage.

Titman, Leeds & Co.—128 N. Broad St., Philadelphia, Pa. (Matheson, Stud-baker.)

Titworth, D. E.—Vice-Pres. Spicer Universal Joint Mfg. Co., 3d St. and Madison Ave., Plainfield, N. J.

Titus, L. H.—Glen St., Glen Cove, L. I., N. Y. Garage; repairs.

Tobin, A. W.—Pres. Continental Motor Mfg. Co., Muskegon, Mich.

Tobin, Benj. F.—Sec. and Treas. Continental Motor Mfg. Co., Muskegon, Mich.

Tobin-Gerlinger Steel Castings Co.—West Allis, Wis. Mfrs. steel castings.

Tobin, Wm.—Foreman J. E. Loneragan & Co., 211-15 Race St., Philadelphia, Pa.

Tocanier e Cia., A.—27 Corso Genova, Milan, Italy. Mfrs. marine motors.

Todd, Edwin S.—Sec. and Treas. Clark Bros. Bolt Co., Milldale, Conn.

Todd, James B.—322 Peachtree St., Atlanta, Ga. (Stoddard-Dayton.) Est. 1906. Repairing.

Toe.—The lower end of a vertical shaft which rests in a step-bearing, q. v. (2) An arm on the valve-lifting rod of a steam-engine. (3) A projection from the foot-piece of an object to give it a broader bearing and greater stability.

Toepfer's Sons, Frank.—413 National Ave., Milwaukee, Wis. (Earl.)

Toggle-joint.—See Joint, Toggle.

Toggle-lever.—See Lever, Toggle.

Tokheim, J. J.—Pres. and Gen. Supt. of Factory, Tokheim Mfg. Co., 815 N. 1st St. W., Cedar Rapids, Ia.

Tokheim Mfg. Co.—815 N. 1st St., W. Cedar Rapids, Ia. Mfrs. oil pumps and tanks of all sizes and weights for gasoline, naphtha, cylinder oil, etc., portable gasoline tanks, shop and factory oil outfits. Cap. \$30,000. Est. 1902. J. J. Tokheim, Pres. and Gen. Supt. of Factory; W. H. Dutton, Sec., Treas. and Mgr.

Tolch & Co.—Fulham, London, England. Mfrs. clutches.

Toledo Automobile Club.—Dr. Chas. P. Wagar, Sec. and Treas., Toledo, O.

Toledo Metal Wheel Co.—163 W. Main St., Rochester, N. Y. Mfrs. nipples.

Toledo Motor Boat & Power Co.—Toledo, O. (Haynes.) Mfrs. motor boats.

Toledo Motor Car Co.—1012 Madison Ave., Toledo, O. (Columbia, Winton, American Mercedes, Pope-Toledo, Baker.)

Toledo Storage Battery Co.—102 Oliver St., Toledo, O. Mfrs. storage batteries. Cap. \$50,000. Est. 1902. J. M. Skinner, Pres.; A. C. Ash, Vice-Pres.; Geo. J. Miller, Electro-Chemist; E. P. Breckenridge, Sec., Treas. and Gen. Mgr.

Tollerton, I. G.—Alliance, O. (Jewel.)

Tollner & Sons, Hugo.—292 Taaffe Pl., Brooklyn, N. Y. (Baker.)

Toluene.—A hydrocarbon closely allied to benzene (formula C_7H_8). It is extracted from the light coal-oils and constitutes one of the elements of the industrial products called benzols. It is extensively used in the india rubber industry for the same purposes as benzene. See Benzene.

Toman Bros.—Trenton, N. J. (Rambler.)

Tomenson, J. S.—Pres. Toronto Automobile Co., 6 Adelaide St., Toronto, Can.

Tompkins, Dr. Geo. J.—701 Church St., Lynchburg, Va. (Maxwell.)

Tompkins, Ray.—Vice-Pres. Eclipse Machine Co., Elmira, N. Y.

Tonawanda Iron & Steel Co.—Iron-ton St., Tonawanda, N. Y.; 60 Erie Co. Bank Bldg., Buffalo, N. Y. Mfrs. sheet and bar iron and steel.

Tone, F. I.—Designer and Gen. Mgr. American Motor Car Co., Indianapolis, Ind.

Toner, T. J.—Pres. Motor Car Maintenance Co., 247 W. 49th St., New York City.

Tongue.—A projection to fit a groove.

Tongue-joint.—See Joint, Tongue.

Tonneau.—An open vehicle having in front two bucket-seats or a single comfortable seat for two, and at the rear a body resembling in form, though quite vaguely, a cask cut through the middle. The rear affords accommodation for 2 or 3, on a seat parallel with the front one, or for four on two opposite seats parallel with the long axis of the car. The characteristic feature of the tonneau is a rear door by which to enter, and at the same time, rear panels rounded to form a rotunda. The rear entrance tonneau is now a thing of the past.

Tool Steel Castings Co.—90 Canal St., Boston, Mass. Mfrs. steel castings.

Toole, J. H.—Mgr. Chicago Branch,

Waltham Mfg. Co., 433 Wabash Ave., Chicago, Ill.

Tooley, A. J.—Vice-Pres. American Gasolene Motor Co., Baldwinsville, N. Y.

Tooling.—A term employed to denote machine processes in general.

Toot Toot.—311 Battery St., San Francisco, Cal. Pub. by the Toot Toot Pub. Co. monthly.

Tooth.—Something resembling a tooth in form or use, as one of the serrations of a saw or the cogs of a gear-wheel.

Top, Canopy.—A non-folding motor-vehicle top.

Topeka Automobile Club.—R. D. Montgomery, Sec., Topeka, Kan.

Topeka Automobile & Cycle Co.—7th and Quincy Sts., Topeka, Kan. Vulcanizing; supplies.

Toplitz, B. L.—Gen. Mgr. the Allenhurst Garage & Automobile Station, 135-47 W. 37th St., New York City.

Toplitz, George.—878 Broadway, New York City. Mfrs. ladies' and men's wearing apparel.

Toppan Boat Mfg. Co.—9 Haverhill Boston, Mass. Mfrs. motor boats.

Topsides.—That portion of a vessel's hull above the water-line.

Toquet Launch & Motor Co., The.—Saugatuck, Conn. Mfrs. motor boats.

Torbensen Motor Car Co.—Bloomfield, N. J. Mfrs. gasolene commercial automobiles.

Torch.—An auxiliary device for starting the fire in the gasolene burners of steam carriages.

Torch, Gasolene.—A lamp for the repair of leaks where the soldering-iron is used. It burns gasolene and can be filled from the supply of the motor-car. See Soldering.

Torchon et Meunier.—7 rue des Acacias, Paris, France. Mfrs. automatic starters.

Torgler, E. R.—Toledo, O. (Jewel.)

Torgorah, John.—Gottenborg, Sweden. (Northern.)

Toronto Automobile Club.—P. E. Doolittle Pres., Toronto, Can.

Toronto Automobile Co.—6 Adelaide St., Toronto, Can. (Pope-Toledo, Pope-Waverley, Pope-Hartford.) Incorporators: W. R. Hicks, Mgr., and J. S. Tomenson.

Torque.—A technical term for the effort that tends to cause a shaft to revolve. See Moment of Force.

Torque-rod.—See Torsion-rod.

Torrey, E. S.—Rockland, Mass. (Caddillac.)

Torrey Roller Bushing Co.—Bath, Me. Mfrs. gasolene marine motors, hub caps and name plates.

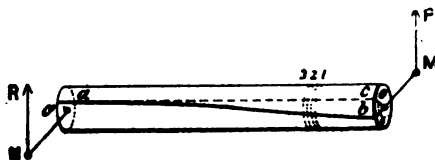
Torrilhon Société Anonyme des Anciens Établissements, J. B.—10 Faubourg Poissonnière, Paris, France. Mfrs. pneumatic rubber tires.

Torrilhon Société Anonyme des Établissements.—Chamalières, Clermont-Ferrand, France. Mfrs. solid tires.

Torsion.—Twisting or the effect of twisting.

Torsion-brake.—A dynamometric apparatus for measuring the horse-power of turbines.

Torsion, Elasticity of.—If one end of round bar, say a shaft (see figure), be rigidly fixed, and to the other be applied a couple, P, tending to produce a rotation which the resistant, R, tends to prevent, the stress produced in the bar will be in the nature of a "shear," and the



line ba originally at ca will the the "angle of torsion." The shear, then, is equal to the angle, α . If the actual amount of tangential force applied per unit of area to the upper end of the bar be q , we have the co-efficient of elasticity of

$$\text{Torsion} = \frac{q}{\alpha}$$

Such co-efficient is termed also the "simple rigidity." In the case of a solid round bar, as here supposed, the calculation of the co-efficient depends upon dividing the bar up into imaginary concentric disks, 1, 2, 3, each of infinitesimal thickness, and then effecting a summation of the results by integral calculus.

Torsion, Resistance to.—The torsional strength or resistance to twisting, in pounds per square inch, of various materials is as follows: Cast-iron, 25,000; Bessemer steel, 80,000; cold drawn steel, 80,000; cold rolled steel, 70,000; tool-steel, 100,000; wrought-iron, 45,000.

Torsion-rod.—A rod, called also a torque-rod," which, in nearly all motor-cars, extends from the rear live axle to the gear-case or a cross-piece of the frame, and the object of which is to prevent the tendency of the driving bevel-gear to roll around on the driven bevel, rather than to revolve it. Were it not for this rod, a continual strain would exist on the parts on account of the tendency of the axle-casing to revolve around the axle, instead of the latter being revolved inside of the casing. The torsion-rod maintains the casing in a correct position and prevents the bevel-gear from getting out of line.

Totman Carriage Works.—12th and French Sts., Erie, Pa. Garage.

Touch-contact Timer.—See Timer.

Touch-spark.—See Ignition.

Touring-car.—A car with stationary

rear seats and a capacity for carrying 5 to 6 persons, and of from 6 to 24 h.p.

Tourisme, Le.—Pub. at 17 rue de Helder, Paris, France.

Tourneur, C. et E.—20 rue Reaumur, Paris, France. Mfrs. jacks.

Tournier les fils de.—Morez, Jura, France. Mfrs. goggles.

Toutain fils et Cie, Frémy.—4 rue Thiébaud, Havre, France. Mfrs. automobile motors.

Touzelet, J.—Dourdan, Seine-et-Oise, France. Mfr. tire pumps.

Towe, Phillip A.—103 North St., Pittsfield, Mass. Garage.

Tower & Lyon Co.—95 Chambers St., New York City. Mfrs. Champion and Perfection screw drivers, engineers' wrenches, involute wrenches, combination plyers. Cap. \$100,000. Est. 1865. Inc. 1902. John J. Tower, Pres.; Thos. D. Halliwell, Vice-Pres.; Warren M. Tower, Treas.

Tower & Son, J. D.—Mendota, Ill. (National)

Tower, J. A.—Riverbank Court, Cambridge, Mass. Garage.

Tower, John J.—Pres. Tower & Lyon Co., 95 Chambers St., New York City.

Tower, Warren M.—Treas. Tower & Lyon Co., 95 Chambers St., New York City.

Towle & Co., E. H.—25 W. Main St., Waterbury, Conn. (Locomobile, Franklin, Cadillac.) Garage; repairs; supplies.

Towle, A. N.—540 Wabash Ave., Chicago, Ill. Garage.

Towne Patent Steering Wheel Co.—214 L. A. Trust Bldg., Los Angeles, Cal. Mfrs. steering wheels.

Townsend, Arthur R.—1148 Bedford Ave., Brooklyn, N. Y. (Knox.)

Townsend, Fred L.—Treas. Geo. H. Lowe Co., 509 Tremont St., Boston, Mass.

Townsend, G. M.—Maryville, Mo. (Earl.)

Townsley, Dr. R. H.—Wagner, S. D. Garage.

Toyah Rapid Transit Co.—Toyah, Tex. (Buick.)

Trabold, A.—217 Woodvale Ave., Johnstown, Pa. (Mitchell.)

Track.—The "track," "gauge" or "tread" of a vehicle is the distance from the center of the tire, on one side of the car, to the center of the tire on the same axle at the other side of the car. The track of automobiles usually varies from 50 inches in light cars to 60 in large ones, but the standard automobile track in America is the same as the railroad gauge, 56½ inches.

Traction, Co-efficient of.—The power required per unit of mass to move a motor-car at a constant speed on a given surface. It is generally expressed in pounds per ton.

Traction Tread Tire & Tube Co.—1695 Broadway, New York City. Mfrs. pneumatic tires.

Tractor.—A motor-vehicle used for hauling other vehicles.

Tractor Co., The.—3d and Trumbull Sts., Elizabethport, N. J. Mfrs. steam commercial automobiles.

Tracy, Joseph.

—Consulting Engineer, designer and racing driver. Was third in the 1905 Vanderbilt race, driving a Locomobile racer, and made creditable performances in many other races on both road and track. Is now devoting the major part of



his time to consulting work and experimenting.

Trageser Steam Copper Works, John.—447-457 W. 26th St., New York City. Mfrs. tanks and brass and copper tubing.

Tragin, E.—15 rue Montalivet, Paris, France. Mfr. la Providence motorcycles.

Trailer.—A vehicle hauled by a "tractor."

Train.—A set of wheels, or wheels and pinions in series, through which motion is transmitted in regular consecution

Trainer & Co., T. W.—Cambridge Bldg., Chester, Pa. (Glide, Jackson.)

Transfer Auto Station.—234 Dudley St., Boston, Mass. Garage.

Transformation of Energy.—See Energy

Transformer.—Same as Converter. See Converter (2).

Transformer, Rotary.—Same as rotary converter. See Converter.

Transmission, Flexible.—Flexible transmissions may be divided into two groups according as it is a question of transmitting an effort of torsion or traction. In the first case, flexible shafts are employed, which serve to connect a tool to its motor, the relative position of the latter being any, whatever. Flexible transmissions generally consist of two cores of steel wire wound in a very close spiral in two opposite directions. In the case of efforts of tractions, to be transmitted in any direction, the Bowden transmission may be profitably employed. This consists of a galvanized piano-wire sliding in a flexible, but incompressible tube, the extremities of which are fixed. The accompanying figure



gives a diagram of the Bowden device. The tube is held between two stops, C. C. Upon pulling the free extremity, D, of the cable, A, any motion desired is produced at the other. An antagonistic spring is necessary to pull the whole back to place, when the action on the point, D, ceases. The Bowden transmission has been applied to motor-cycle brakes, and, in some cases, to automobiles. An example of this latter application may be found in the cable leading to the brake-drums on the hubs of a motor-car.

Transmission-gear.—The gearing through which the power from the motor in a motor-vehicle is transmitted to the rear axle. There are four distinct types of transmission-gear, viz., sliding-gear, planetary-gear, individual clutch and friction drive. The first two systems are in general use, the individual clutch being employed only to a limited extent, and the friction drive having but few advocates. See Sliding-gear, Planetary-gear, and Friction-drive.

Transmission, Power.—In the transmission of power to the driven wheels of a motor-vehicle, seven varieties of transmission are distinguished: (1) By chain and sprocket from the main shaft direct to the differential on the rear axle. (2) By chain and sprocket to each rear wheel separately, from a counter-shaft, driven direct from the motor. (3) By a propeller shaft from the motor to the rear axle. (4) by Spur-gear from the motor-shaft to the differential on the rear axle in electric vehicles. (5) By spur connection to an external or internal gear on each of the rear wheels from a transverse differential shaft in some electric vehicles. (6) By spur connection to an external or internal gear on each drive wheel, between each wheel and a separate motor, in electric vehicles solely, and (7) By the use of the hub of each wheel as one element of the motor, in electric "hub motors."

Transom.—Athwartship pieces forming the buttocks of a boat and extending across the stern-post, to which they are bolted. (2) A transverse piece of timber serving as a strut between two parallel members.

Transom Knees.—Curved timbers which bind and connect a boat's quarter to the transoms, being bolted to the latter and to the after timbers.

Transom-stern.—Same as square-stern.

Transverse-shaft.—See Shaft, Counter.

Trap-valve.—See Valve, Trap.

Trasue & Williams Co., The.—Alliance, O. Mfrs. drop forgings.

Traugott Golde.—Gera-Reuss, Germany. Mfrs. tops.

Travel.—The distance through which a part of a mechanism can move in a straight line.

Travelers' Insurance Co.—Hartford,

Conn. Automobile liability and accident insurance. New York office, 32 Nassau St.

Traveling-nut.—See Steering-gear.

Traver Blow-out Patch Co.—1265 Broadway, New York City. Mfrs. tire patches.

Traver, Judson D.—Rhinebeck, N. Y. (Waltham.)

Travis & Oczho.—215 N. Perry St., Johnstown, N. Y. Garage.

Travis Auto Co., C. W.—23 Main St., Evansville, Ind. (Buick, Pope-Waverley, Cadillac.)

Tray Plate Battery Co.—5 Frederick St., Binghamton, N. Y. Mfrs. tray plate storage batteries and all cell types, electric automobile and sparking batteries. Cap. \$50,000. Est. 1902. E. A. Beman, Pres.; Geo. C. Bayless, Treas., and A. C. Rane, Sec.

Treacy & Pierce.—Roanoke Rapids, N. C. (Waltham.)

Tread.—That portion of the surface of a tire that comes into contact with the road. (2) The distance, called also "gauge" and "track," from the center of the tire, on one side of the car, to the center of the tire on the same axle at the other side of the car. (3) That part of a runningboard on which the foot rests in stepping into or out of a car. (4) The length of a vessel's keel. (5) The gearing surface of a wheel.

Tread, Herringbone.—See Herringbone Tread.

Treat & Clark.—25 Palm St., Bangor, Me. (Mitchell, Jackson, Logan, Maxwell.)

Treat, S. W.—Atlantic, Ia. (Mason.) Est. 1906.

Trebert Gas Engine Co.—35-37 Ford St., Rochester, N. Y. Mfrs. gas engines, 9 styles and sizes, for marine and automobile purposes, gasoline automobiles. Cap. \$50,000. Est. 5 years. E. S. Bartlett, Pres.; Geo. Wagner, Jr., Sec. and Treas.; J. M. Morris, Supt.

Trecker & Son, C.—Odell, Ill. (Ramblers, Reo, Premier, Buick.)

Tredway, W. S.—Norwood, O. (Wayne.)

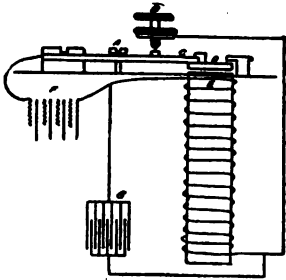
Tregoning Electric Mfg. Co. The.—224 High Ave. S. E., Cleveland, O. Mfrs. wire terminals.

Trembler.—A device, called also a "vibrator" and sometimes a "buzzer," for making and breaking an electric current. It consists of a flat steel spring secured at one end so that it may vibrate. At about its center an adjusting-screw touches it, and when the spring vibrates it springs away from the screw and returns to it. If one wire of the circuit is attached to the spring and the other to the screw, the circuit will be complete when the spring touches the screw, and broken when it springs away from it.

This type has been almost entirely replaced by the "magnetic vibrator," q. v.

Trembler-coil.—A coil with a trembler for making and breaking contact. See Coil, Induction.

Trembler, Magnetic.—For producing an induced current in the secondary circuit of an induction coil it is necessary to make and break the current. For this purpose a magnetic "trembler" is placed in the circuit. A soft iron core placed in the interior of a coil, E (see figure) is magnetized at the moment of the passage of the primary current, and attracts a mass of metal (hammer), D, fixed on a spring, C. The current which passes is broken by the separation of D and the



contact-screw, B. The soft iron core is demagnetized and the spring, C, raises the hammer and comes in contact with B again and at once re-establishes the current. The soft iron core is again magnetized and the phenomenon occurs anew. Consequently, at each position of D there is a breaking or making of the induced current, which occurs so rapidly that a buzzing sound is produced.

Tremont Garage.—541 Tremont St., Boston, Mass. Garage.

Tremont Garage & Repair Station.—1923 Washington Ave., New York City. Garage.

Trenery & Co., C. L.—700-720 Court St., Le Mars, Ia. (Gale, Queen, Olds.) Est. 1884, automobile, 1901. Garage, 20 cars. Repairing.

Trenton Auto & Supply Co.—130 N. Warren St., Trenton, N. J. Garage.

Trenton Electric Auto Garage.—Trenton, N. J. (Columbus.)

Trenton Malleable Iron Co., The.—New York Ave. Trenton, N. J. Mfrs. jacks, gasoline automobile motors and tire irons.

Trenton Rubber Mfg. Co.—Trenton, N. J. Mfrs. tire cement, rubber mats, tire patches and inner tire tubes.

Tricar.—A motor vehicle comprising three wheels, one driving wheel in the rear and two steering wheels in front, and with two seats, one behind the other or side by side.

Trig.—A shoe for a wheel to ride on in descending a hill. A skid.

Trim.—The set of a boat on water, whether by head or stern, or on an even keel.

Trimble, G. T.—Ellsworth, Kan. (Northern.)

Trimmer, Dr. E. D.—High Bridge, N. J. (Maxwell.)

Trimont Mfg. Co.—Roxbury, Mass. Mfrs. wrenches.

Trinity Chimes Co., The.—29 N. Capitol Ave., Indianapolis, Ind. Mfrs. exhaust horns.

Trip or Trippet.—A projection intended to strike some object at regularly recurring intervals; a cam, lifter, toe or wiper.

Trip-rod.—The same as tappet-rod. See Rod, Tappet

Tripri Bros. & V. De Prisco Co.—Factory, cor. Broome & Mott Sts.; office, 179 Mott St., New York City. Mfrs. horns, brass tubing, screens and bulbs.

Triple Action Spring Co.—1254 Michigan Ave., Chicago, Ill. Mfrs. shock absorbers.

Triple State Electric Co.—McFarland St., Charleston, W. Va. (Pope-Waverley.)

Tripoli.—A fine and earthy siliceous material, usually reddish and of a geological origin similar to that of "rottenstone," and like it, used for polishing metals.

Tripp, B. D.—Marion, Mass. Garage.

Tritt, B. E.—Sec., Treas. and Gen. Mgr. Tritt Electric Co., 301 Division St., Union City, Ind.

Tritt, C. W.—Vice-Pres. Tritt Electric Co., 301 Division St., Union City, Ind.

Tritt, E. C.—Pres. Tritt Electric Co., 301 Division St., Union City, Ind.

Tritt Electric Co.—301 Division St., Union City, Ind. Mfrs. magnetos, spark coils, storage batteries, storage battery chargers, battery switches and spark plugs. Cap. \$100,000. Est. 1904. E. C. Tritt, Pres.; C. W. Tritt, Vice-Pres.; B. E. Tritt, Sec., Treas. and Gen. Mgr., and R. J. Tritt, Supt.

Tritt, R. J.—Supt. Tritt Electric Co., 301 Division St., Union City, Ind.

Triumph Cycle Co., Ltd.—Coventry, England. Mfrs. Triumph motorcycles.

Triumph Engineering Co.—226 Lafayette St., New York City. Mfrs. spark plugs.

Triumph Mfg. Co.—Nashville, Tenn. Mfrs. gasoline and keronene burners.

Trojan Button Fastener Co.—594 River St., Troy, N. Y. (Queen, Gale.)

Trout, H. G.—King Iron Works, 226 Ohio St., Buffalo, N. Y. Mfrs. brass castings.

Troutt Yokom Car Co.—Port Huron, Mich. Mfrs. gasoline commercial automobiles.

Trowbridge Co., F. A.—17 South St., Morristown, N. J. (Reo, Premier.) Est.

1898. Cap. \$10,000. F. A. Trowbridge, Sec., Treas. and head of department. Garage, 50 cars. Repairing; garage; supplies; electric charging.

Trowbridge, F. A.—Sec. and Treas. F. A. Trowbridge Co., 17 South St., Morristown, N. J.

Troy & Albany Auto Exchange.—State and Larke Sts., Albany, N. Y. (Franklin.)

Troy Auto Exchange.—22 4th St., Troy, N. Y. (Buick, Pierce Arrow, Pope-Toledo, Franklin.)

Troy Carriage Sunshade Co.—Troy, O. —Mrs. automobile tops and wind shields.

Troy Carriage Works.—745 3rd Ave., and 5th Ave. and Federal St., Troy, N. Y. (Chadwick, Mitchell, Frayer-Miller, Wayne, Baker.) Est. 1882. Cap. \$40,000. J. K. P. Pine, Pres. and M. J. Adams, Sec. and Treas. Repairing.

Troy Spring Works.—394-96 Congress St., Troy, N. Y. Mfrs. leaf springs.

Troyell, Joseph.—Sec. and Mgr. New Amsterdam Motor Co., 152 W. 56th St., New York City.

Truchet.—11 rue du Léman, Geneva, Switzerland. Mfrs. non-skids.

Truck.—A heavy freight vehicle with a platform body without side-panels, and with either two or four wheels.

Truffault, Jules.—51 Avenue des Inventor of the Truffault shock-absorber for automobiles.

Trumbauer, W.—836 Delaware Ave., Bethlehem, Pa. (Ford.)

Trump, Rob't. W.—Gen. Mgr. Philadelphia Stove & Iron Foundry Co., 1631 N. 5th St., Philadelphia, Pa.

Trumpet.—One of the two trumpet-shaped pieces that constitute a rear support to the speed-boxes of the C. G. V. cars.

Trunk-cabin.—A cabin half above and half below the upper deck of a vessel.

Trunk-piston.—See Piston, Trunk.

Trunnion.—One of the two short projecting axles or pivots on which an oscillating cylinder, Bessemer converter, etc., turns in its support.

Truscott Boat Mfg. Co.—St. Joseph, Mich. Mfrs. gasoline marine motors, automobile motors and motorboats.

Trutz, N.—Coburg, Germany. Mfr. bodies.

Try-cock.—See Cock, Try.

Tubbs, Dr. R. B.—Council Bluffs, Ia. (Holsman.)

Tube.—A general name for pipe of any description, excepting that made of cast iron.

Tube-bending.—See Tubing.

Tube-drawing.—See Tubing.

Tube-expander.—A tool used for widening the ends of metal tubing by means of pressure applied to the inside of the

tube. It is used especially in fixing the ends of boiler or condenser tubes in the tube-plate.

Tube, Finger.—See Boiler.

Tube, Fire.—See Boiler.

Tube Ignition.—See Ignition.

Tube, Inner.—In a pneumatic tire, an air-tight tube of rubber which fits within the casing.

Tube-plate.—The plate which carries the ends of the tubes in a boiler or surface condenser.

Tube, Platinum.—See Platinum Tube and Ignition.

Tube-plug.—See Boiler, Tube-plug.

Tube, Water.—See Boiler.

Tubing.—A term for pipes of other material than cast iron, say wrought iron, steel, brass and copper. It is distinguished as "solid drawn" when made without a seam. If made with a seam, the joint ("lap," or "butt") is brazed, welded, soldered, or, in some cases, riveted.

Copper tubes of small diameter may be bent cold, by hand simply. When over half an inch in diameter they cannot be bent without first filling them with melted resin or lead. After this a curved form may be easily given them without any danger of breakage. The folds or wrinkles formed at the bend may be removed by the light and repeated blows of a round-faced hammer. Steel tubes, even of small diameter, cannot be bent by hand when empty, but must be previously filled with very dry sand. This done, the place in the tube where the bend is to be made is heated, and the curving is effected in a vice and by the use of a hammer, if need be.

In the manufacture of seamless steel tubing, the first operation consists in heating a large billet of steel (of the finest grade if for axles) and placing it in a machine in which it is pierced longitudinally through the center. Then it is re-heated and drawn through a die which reduces its size and increases its length. This operation is repeated until the tube is sufficiently reduced for the final process of cold drawing. This is very similar to the previous operations except that the tube is not heated again, but is drawn through the die cold, an operation that gives it a bright polish and compresses the grain of the steel, and adds materially to its stiffness. In this condition it is taken from the machine ready for use.

Tubing-machine.—A machine, called in England a "Spewing machine," used for the manufacture of solid rubber tires. It consists of a large screw revolving inside of a steel tube at the mouth of which there is an opening shaped for the tire. The rubber dough is fed into the rear of the tube and "spewed" out of the

mouth in a form that just fits the mould in which it is baked.

Tucker, Albert Badgley.—Writer on automobiling and kindred topics. B. Boston, Mass., March 6, 1869. Ed. public and high school. Sec. N. A. A. M. November, 1903, until May 1, 1904. Sec.



Photo by Spomer and Wells

touring board A. A. A. 1904-1905. In charge of A. A. A. tour, Buffalo to St. Louis, 1904. Supt. 1st Glidden tour, Buffalo to Bretton Woods and return, 1905. Supt. 2nd Glidden tour, New York to Bretton Woods, 1906. Racing Sec. Florida East Coast Automobile Club and Supt. of Ormond Beach races, Dec. 1904 to Feb. 1905. Contributor to Automobile Topics and other publications on automobile and similar subjects. Since October, 1905, has been commercial press agent for numerous leading manufacturers.

Tucker, C. F.—Hartford, Conn. Mfr. oil cups and oil guns.

Tucker, Geo.—Brattleboro, Vt. (Cartercar.)

Tucker, Harry S.—Supt. of garage R. H. Beacham & Son, Fleet St., Portsmouth, N. H.

Tucker, James B.—Pres. and Gen. Mgr. The Tucker Wood Work Co., Sidney, O.

Tucker, J. P.—Wiscasset, Maine. (Haynes.)

Tucker, W. M.—399 Spadena Ave., Toronto. Can. Garage

Tucker Wood Work Co., The.—Sidney, O. Mfrs. automobile and carriage seat bendings, steering wheels and bicycle rims. Cap. \$150,000. Est. 1895. James B. Tucker, Pres. and Gen. Mgr. W. C. Horr, Sec. and Treas.

Tulane Automobile Co.—933 Perdido St., New Orleans, La. (Royal.)

Tulley, John L.—Pres. and Designer Albany Automobile Co., Albany, Ind.

Tulsa Automobile Co.—Tulsa, Indian Ter. Garage.

Tumble-home.—That part of the hull in some vessels which leans inward, above the line of greatest breadth. (2) The distance or amount of such leaning, on one side of the vessel.

Tundish.—The same as funnel.

Tungsten.—A rare metal, called also "wolfram" (symbol W), extracted from wolfram (tungstate of iron and mineral manganese) or from scheelite (tungstate of calcium). It is slightly fusible and employed in the metallurgy of iron and steel to obtain a very durable product called "tungsten steel." It is also used

for making the filaments for "tungsten lamps."

Turbine.—A motor in which rotary motion is obtained by the gradual change in the momentum of a fluid.

Turckheimer.—4 via Lambro, Milan, Italy. Mfrs. motorcycles.

Turgan Etablissements Ltd.—96 Rue Antonin-Raynaud, Levallois, Perret-Seine, France. Mfrs. steam commercial automobiles and gasoline commercial automobiles. (Turgan.)

Turnbuckle.—A coupling so threaded or swiveled in the center that when con-



necting lengthwise two rods, pipes or wires it may be turned so as to regulate the length or tension of the connected parts.

Turnbull, G. A.—440 S. Main St., Princeton, Ill. (Moline.) Est. 1900. G. A. Turnbull, Prop. Garage, 10 cars. Repairing.

Turnbull, Wm.—221 S. Madison St., Peoria, Ill. Garage.

Turntable.—A revolving platform in



or movable on a floor for turning motor vehicles around.

Turner & Co., Ltd.—1 George St., Lisson Grove, London, W., England. Mfrs. carburetters.

Turner & Milner.—1532-4 Michigan Ave., Chicago, Ill. General machine shop.

Turner Brass Works, The.—Sycamore and Chicago, Ill. Mfrs. automobile bumpers, foot treadles, reserve valves, mufflers, carburetters, name plates, gasoline torches and appliances, oilers, aluminum castings and machinery, tire pump inflators. Cap. \$150,000. Est. 1871. C. C. Reckitt, Pres.; Geo. B. Vance, Gen. Mgr.; Robert Kerr, Sec. Heads of Depts.: Geo. B. Vance, Mgr. Contract Dept.; Robt. Kerr, Mgr. Torch Dept.; Frank A. Reid, Mgr. Name Plate Dept., and F. C. Binkley, Mgr. Automobile Dept. Aug. Dobrick, Supt.; H. H. Smith, Purch. Agt.

Turner, F. A.—Sandwich, Ill. (Holsman.)

Turner, G. W.—45 Stanhope St., Boston, Mass. Garage.

Turner's Motor Mfg. Co.—Wolverhampton, England. Mfrs. steam automobiles (Turner-Miesse).

Turrell & Co., H. M.—17-19 Jefferson St., Waterbury, Conn. (Rambler.)

Turrell, Frank.—Asst. Supt. Auburn Auto Co., Auburn, Ind.

Turtle-deck.—See Deck, Turtle.

Tuthill, Frank H.—Pres. Tuthill Spring Co., 215 W. Polk St., Chicago, Ill.

Tuthill, R. S.—Unionville, N. Y. (Holsman.)

Tuthill Spring Co.—215 W. Polk St., Chicago, Ill. Mfrs. automobile springs. Cap. \$50,000. Est. 1880. Frank H. Tuthill, Pres.; William H. Tuthill, Sec. and Treas.

Tuthill, William H.—Sec. and Treas. Tuthill Spring Co., 215 W. Polk St., Chicago, Ill.

Tuttle, D. M.—Pres. D. M. Tuttle Co., Canastota, N. Y.

Tuttle Co., D. M.—Canastota, N. Y. Mfrs. gasoline motors and motor-boats. Cap. \$60,000. Est. 1897. D. M. Tuttle, Pres.; W. H. Tuttle, Sec. and Treas.; J. B. Holden, Head of Motor Dept.; A. E. Scofield, Hd. Launch Dept.

Tuttle Mfg. Co.—South Norwalk, Conn. Mfrs. motor-boats.

Tuttle, W. H.—Sec. and Treas. D. M. Tuttle Co., Canastota, N. Y.

Tuxedo Garage Co.—33 E. 58th St., New York City. Garage.

Tweedy, O. S.—Treas. Ventilated Cushion & Spring Co., Jackson, Mich.

Twentieth Century Mfg. Co.—19 Warren St., New York City. Mfrs. lamps. Cap. \$100,000. Est. 1897. Mem. M. & A. M. W. J. Crary, Pres. and Treas., and James N. Quakenbush, Sec.

Twentieth Century Motor Car Co.—121-125 S. Lafayette St., South Bend, Ind. (Buick.) Est. 1895. M. L. Williams, Prop. Mfrs. folding wind shields; also transmission bearings. Garage, 100 cars. Repairing.

Twenty-ninth St. Automobile Station.—95-7 29th St., Chicago, Ill. Repairing.

Twenty-second St. Garage.—Toledo, O. (Ford.)

Twin-screw.—See Screw; Twin.

Twining Auto Co.—218 N. Broad St., Philadelphia, Pa. Mfrs. motorcycles.

Twining Co., Thos. W.—326 N. Broad St., Philadelphia, Pa. (Crawford, Marion.)

Twist-drill.—The same as auger-bit.

Twist-gear.—See Gear, Screw.

Two-cycle.—See Cycle.

Two-throw Crank-shaft.—See Crank-shaft.

Two-to-one Gear.—See Gear, Two-to-one.

Twyford Motor Car Co.—Brookville, Pa. Mfrs. gasoline automobiles.

Tygar, James W.—920 South Ave., Plainfield, N. J. Garage.

Tyler & Sons.—Belle Isle, King's Cross, London, N., England. Mfrs. carburetters.

Tyler & Sweezy.—Junction City, Kan. (Rambler, Premier.)

Tyler, A. W., Jr.—Chief Draughtsman and Inspector Muncie Auto Parts Co., Elliott St. and L. E. and W. Yards, Muncie, Ind.

Tyler Co., W. S.—1158 St. Clair St., Cleveland, O. Mfrs. horn screens.

Tyler, F. W.—Chester, Conn. Garage.

Typhonoid Screw.—See Screw, Typhonoid.

Tyrone Motor Car Co.—Tyrone, Pa. (Rapid.)

Tyrrell, Geo. H.—2639 Webster Ave., New York City. Garage.

U

U-Section.—A cross-section shaped like a flat-bottomed U.

Ulrich & Co.—Buffalo, N. Y. Mfrs. metal polish.

Ultimate Strength.—The total load which is necessary to break a structure or a given piece of material.

Unbuilding.—The demagnetization of the field magneto of a dynamo or motor.

Uncas Specialty Co.—21 Shipping St., Norwich, Conn. Member M. & A. M. Cap. \$50,000. Est. May 21, 1905. F. W. Browning, Pres.; F. S. Jerome, Vice-Pres.; B. F. Leavitt, Sec. and Treas. New York City office, 1691 Broadway.

Underberg et Cie., E.—rue de Coulmiers, Nantes, France. Mfrs. marine motors.

Underhay Oil Co.—275 Franklin St., Boston, Mass. Mfrs. oils.

Underhill, Benj.—Gen. Mgr. Pierson Motor Supply Co., 1175 Bedford Ave., Brooklyn, N. Y.

Underslung Battery.—See Battery, Underslung.

Underwood, Chas. R.—Pres. Central Motor Car Co., Bloomfield, N. J.

Uniform Steel Co.—Newark, N. J. Mfrs. steel castings.

Union.—A fitting whereby two pieces of pipe can be connected and be easily disconnected without unscrewing the pipe.



Union Auto Co.—Washington, D. C. (Elmore.)

Union Auto Co.—Bulls Ferry Rd. and Main St., Union Hill, N. J. (National, Rambler.)

Union Auto Co.—1651 Elk St., Bellingham, Wash. (Winton, Cadillac, Auto-car.)

Union Auto Garage Co.—35 S. College St., Akron, O. (Buick, Pope-Toledo, Thomas Flyer.)

Union Automobile Co.—521 Homewood Ave., Pittsburg, Pa. (Panhard, Renault.)

Union Automobile Co.—Homewood, Pa. Garage.

Union Automobile Co.—33 Grant Square, Brooklyn, N. Y. Garage.

Union Automobile & Supply Co.—Plainview, Tex. (Pope-Hartford.)

Union Bow Co.—421 Superior Ave.,

N. W., Cleveland, O. Mfrs. bows of all kinds.

Union Carbide Co.—Michigan Ave. and Adams St., Chicago, Ill. Mfrs. carbide.

Union City Body Co.—Factory, West Pearl St., Union City, Ind. Mfrs. automobile seats and bodies. Cap. \$10,000. Est. 1903. A. R. Bell, Pres. and Treas. C. C. Adelsperger, Sec.

Union County Automobile Association.—W. H. P. Veysey, Sec., Plainfield, N. J.

Union Drawn Steel Co.—Beaver Falls, Pa. Mfrs. steel.

Union Drop Forge Co.—64-76 E. Ohio St., Chicago, Ill. Mfrs. drop forgings.

Union Garage.—784-86 Union St., Brooklyn, N. Y. Garage.

Union Garage.—Pasadena, Cal. (Ford.)

Union Garage Auto Co.—St. Louis, Mo. (Rauch and Lang.)

Union Electric Light & Power Co.—3920 Morgan St., St. Louis, Mo. (Rauch and Lang, Studebaker, Columbia.) Cap. \$10,000,000. W. V. N. Powelson, Gen. Mgr.; Chas. E. Michel, Head of Automobile Dept. Garage, 52 cars. Repairing.

Union Steam Pump Co.—Battle Creek, Mich. Mfrs. boilers, fuel and air pumps.

Union Steel Screw Co.—Cleveland, O. Mfrs. bolts, nuts, screws.

Unique Metal Co.—25 Illinois St., Buffalo, N. Y. Mfrs. red and yellow brass, phosphor and manganese bronze, copper and aluminum. Cap. \$10,000. Est. 1904. W. G. Grove, Sec. and Treas.; P. M. White, Pres.; Chas. Dutcher, Gen. Mgr.

Unit.—A selected quantity, the amount of which is fixed and invariable, used as a standard of comparison in stating or determining the amounts or values of other quantities of the same nature. The fundamental units generally chosen are those of "length," "mass" and "time." From these are obtained "derived units." The chief units in mechanics, and their symbols, are "velocity" (V); "acceleration" (A); "force" (F); and "work" (W).

Unit of Heat.—See Calorie.

Unit of Work.—See Work.

United Mfg. Co.—175 Woodbridge St., Detroit, Mich. Mfrs. gasoline automobile and marine motors.

United Motor Car Co.—6112 Euclid Ave., Cleveland, O. (Dragon.)

United Motor Industries, Ltd.—Sherbourne Works, Coventry, England. Mfrs. storage batteries, electric horns, spark plugs, goggles, coils.

U. S. Jack Co.—128-30 W. Lake St., Chicago, Ill. Mfrs. automobile jacks and tire tools. Cap. \$2,500. Est. 1904. A. J. Oliver, Pres.; J. W. O'Leary, Sec. and Treas.

U. S. Cast Iron Pipe & Foundry Co.—280 Box Ave., Buffalo, N. Y. Mfrs. iron pipe.

U. S. Steel Products Export Co.—203 Ellicott Sq., Buffalo, N. Y. Mfrs. steel.

United States Aluminum Castings Co.—Hamilton and Vandalia Aves., Cincinnati, O. Mfrs. aluminum and brass, bronze, aluminum and copper castings.

United States Aluminum Co.—Pittsburg, Pa. Mfrs. aluminum, brass, bronze, aluminum and copper castings, dashes and fenders.

United States Automobile Co.—21-29 Plymouth Ave., nr. Main St., W., Rochester, N. Y. (Locomobile, Stevens-Duryea, Pierce Arrow, Stearns.) Supplies; garage; repairing.

United States Battery Co.—New Rochelle, N. Y. Mfrs. storage batteries.

United States Bronze Co.—149 Columbus St., Cleveland, O. Mfrs. aluminum, brake bands, brass, bronze, aluminum and copper castings, Babbitt and bronze metals, aluminum solder.

United States Coil Co.—Jersey City, N. J. Mfrs. spark coils and plugs.

United States Dash & Fender Co.—147 E. 42nd St., New York City. Mfrs. automobile tops.

United States Electro-Galvanizing Co.—1-9 Park Ave., Brooklyn, N. Y. Galvanizing.

United States Emergency Case Co.—Utica, N. Y. Mfrs. medical emergency cases.

United States Fastener Co.—95 Milk St., Boston, Mass. Mfrs. curtain fasteners.

United States Graphite Co.—Saginaw, E. S., Mich. Mfrs. graphite, grease.

United States Indestructible Gasket Co.—16 S. William St., New York City. Mfrs. corrugated and plain copper, lead, steel, bronze, etc. gaskets of every size, shape and thickness.

United States Industrial Alcohol Co.—100 Williams St., New York City. Mfrs. denatured alcohol.

United States Mineral Wool Co.—140 Cedar St., New York City. Mfrs. gaskets.

United States Tube and Iron Co.—Pittsburg, Pa., Mfrs. wrought iron and steel pipe.

United Wire & Supply Co.—109-19 Summer St., Providence, R. I. Mfrs. brass and copper tubing, seamless and brazed;

silver solder for brazing. Cap. \$2,000,000. Est. 1901. Chas. Sydney Smith, Pres.; Wm. B. Gladding, Vice-Pres.; Henry E. Smith, Treas.; A. J. Stillman, Asst. Treas.; Henry T. Smith, Gen. Mgr.; Chas. M. Holmes, Asst. Gen. Mgr.

Universal Clutch Co.—226 S. 11th St., Philadelphia, Pa. Mfrs. clutches.

Universal Coupling.—See Joint, Hooke's.

Universal Cross.—See Cross.

Universal Electric Storage Battery Co.—108 La Salle St.; Factory, 36-38 Union Park Place, Chicago, Ill. Mfrs. train lighting, vehicle and ignition batteries. Cap. \$600,000. Est. 1905. A. F. Callahan, Pres.; H. B. Spencer, Vice-Pres.; J. S. Burnet, Sec. and Treas.; W. Bentley, Supt., and Edward Sokal, Chief Chemist.

Universal Joint.—See Joint, Universal.

Universal Tire Repair Co.—1900 Broadway, New York City. Vulcanizing.

Universal Tool Co.—54 Taylor St., Springfield, Mass. Mfrs. tools.

University Auto Co.—30 Carlton Pl., Rochester, Pa. (Mitchell.)

University Garage Co.—St. John and Olive Sts., New Haven, Conn. Supplies; garage. (Wayne.)

University Place Garage.—Washington Sq., New York City. Garage.

Unkrich, Fred.—Schaefer Block, Galion, O. Garage.

Unterberg und Helme.—Karlsruhe, Germany. Mfrs. high tension magnetos.

Unwin, Harry.—Salesman Peerless Motor cars. B. Cambridge, England, June 4, 1868. Ed. Cambridge, England. Res., 664 Laurel Ave., Bridgeport, Conn. Office, Bridgeport, Conn. In the trade since Jan. 15, 1902. During 1902-3 Sec. N. A. A. M. Handled export business at Detroit for Olds Motor Works. Had New York agency for Pierce Arrow. New York Sales Mgr. White cars 1906.7.

Updike, C. Ora.—145 E. Main St., Lexington, Ky. (Rambler.) Est. 1901. Garage, 20 cars. Repairing.

Upham Co., U. J.—Duluth, Minn. (Waltham.)

Upper Automobile Co.—35 Clifford St., Providence, R. I. Garage.

Upper-works.—The side of a vessel's hull from the water-line to the covering-board.

Upsetting.—The shortening or thickening of metal by end compression, either by hammering or machinery. (2) Spreading the teeth of a saw.

Upton Bolt & Nut Co.—Cleveland, O. Mfrs. bolts, nuts and washers.

Uptake.—A term applied to that portion of a steam boiler arrangement through which the hot gases pass before making their entrance into the atmosphere.

Upthegrove Sporting Goods Co.—Val-

paraiso, Ind. Mfrs. miscellaneous wearing apparel.

Up-to-date Garage.—1141 1st St., San Diego, Cal. (Réo.)

Upton, King.—Pres. Helios Mfg. Co., Bridesburg, Philadelphia, Pa.

Ure & Co., John, Jr.—172 12th St., Milwaukee, Wis. (Marmon.)

Urich, Harry C.—Treas. Reading Metal Body Co., Reading and Fleetwood, Pa.

Urling, Geo. A.—Treas. Hiland Automobile Co., 5811-17 Center Ave., Pittsburgh, Pa.

Urquhart, A. S.—Calgary, Alta, Can. (Matheson, Northern.)

Urquhart, W. J.—Mgr. Chicago Branch The White Co., 240 Michigan Ave., Chicago, Ill.

Urquiza, M. M.—Queretaro, Mex. (Holsman.)

Usine Fulminator.—Saventhem, Belgium. Mfrs. coils.

Usines de Puteaux Société Anonyme.—4 rue de Paris, Puteaux, Seine, France. Mfrs. gasoline commercial automobiles. (U. D. P. X. trucks.)

Usines de Sainte-Marie et Gragny Société Anonymes des.—Gragny, Eure, France. Mfrs. metallic rims.

Usines de Saventhem.—Saventhem-lez-Bruxelles, Belgium. Mfrs. marine motors.

Usines et Fonderies de Baume et Marent.—Haine-Saint-Pierre, Belgium. Mfrs. gasoline automobiles.

Usines Jackson.—Halluin, Nord, France. Mfrs. pneumatic tires.

Utah Automobile Co.—57 Market St., Salt Lake City, Utah. (Pope-Toledo.)

Utermöhle Gesellschaft, J. W.—Köln, Germany. Mfrs. gasoline automobiles.

Utica Automobile Station.—22-24 W. Utica St., Buffalo, N. Y. Supplies; garage; repairs.

Utica Cycle Co.—21 Columbia St., Utica, N. Y. (Rambler.)

Utica Drop Forge & Tool Co.—75 Genesee St., Utica, N. Y. Mfrs. nippers and pliers. Est. 1895. Wm. Pierrepont White, Pres.; H. F. Kellemen, Vice-Pres.; Hugh White, Sec. and Treas. New York Office, 108 Duane St., New York City.

Utica Foundry Co.—Utica, N. Y. Mfrs. gray iron castings.

Utica Motor Car Co.—333 Bleecker St., Utica, N. Y. (Buick, Peerless, Pierce Arrow, Thomas Flyer, Baker, Cadillac, Darracq.) F. P. Miller, Pres.; E. J. Otis, Vice-Pres.; H. H. Mundy, Treas.; A. B. Maynard, Gen. Mgr. Garage; repairs; supplies.

Utica Steam Engine & Boiler Works.—Utica, N. Y. Mfrs. gray iron castings.

Utility Co., The.—233 Greenwich St., New York City. Mfrs. hand soap and tire-irons.

Utz, J. G.—Designer E. R. Thomas Detroit Co., 2704-2718 Jefferson Ave., Detroit, Mich.

V

V.—Symbol for "vanadium."

V.—Symbol for (1) "velocity"; (2) "volume"; (3) potential difference or "electromotive force."

V-shaped Belt.—See Belt.

V-shaped Motor.—See Motor.

Vaala & Natwig.—Saude, Ia. (Holzman.)

Vachon, Louis A.—1209 Center St., Newton Center, Mass. Garage.

Vacuum.—Theoretically, an empty space, containing no matter whatever. In practice the term is applied to a space containing gas at a very low pressure.

Vacuum-pump.—The same as air-pump.

Vacuum Oil Co.—Rochester, N. Y. Mfrs. oils.

Vadon, C.—17 rue du Musée, Lyon, France. Mfr. non-skids.

Vale, Harry M.—736 Broad St., Beloit, Wis. (Rambler.)

Valentine & Co.—257 Broadway, New York City. Mfrs. paints, varnishes.

Vallade et Cie.—116 Bvd. Pereire, Paris, France. Mfrs. automobile motors.

Vallée, V.—23 passage Menilmontant, Paris, France. Mfr. acetylene lamps.

Vallejo Auto Exchange.—P. O. 427 Vallejo, Cal. Garage.

Valley Automobile Co.—133 E. Market St., Warren, O. (Cadillac, Baker, Pope-Hartford, Pope-Toledo.)

Valve.—A device for closing a pipe or passage in order to control, or entirely stop, the flow of a liquid or gas. Valves, as regards motion relative to their seat, may be divided into three classes, viz.: (1) rotary valves, which rotate in opening, as the throttle-valve; (2) lifting valves, which rise perpendicularly, or nearly so, as the poppet-valve; and (3) sliding valves, which open by moving parallel with their seat, as the D-valve. Valves are of various types, and are sometimes named from their form, as "ball-valve," "needle-valve," "D-valve," "mushroom-valve," etc.; and sometimes from their functions, as "check-valve," "slide-valve," "rotary-valve," "safety-valve," etc.

Valve, Admission or Inlet.—In a gas-motor, the valve through which the explosive mixture is admitted to the cylin-

inder. Inlet-valves are of two kinds,

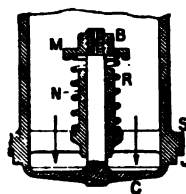


Fig. 1

automatic and mechanical. The former C (Fig. 1) is opened by the vacuum due to the descent of the piston and is afterwards closed by the spring, R, while the opening of the latter, C (Fig. 2), is effected by mechanical means, that universally adopted being a push-rod, T, controlled by a cam, C, working on a short shaft revolving at half the velocity of the crank shaft and termed a "half-speed shaft."

Valve, Air.—A valve for admitting air to relieve the pressure in a steam-boiler when the steam is allowed to condense.

Valve, Air, Automatic.—A valve for maintaining an even quantity of the gaseous mixture in the carburetter as the motor speeds up or slows down. This it does by automatically opening and closing to admit more or less air as it is needed.

Valve, Annular.—A valve consisting of numerous ring-like heads which rest in corresponding ring-like openings.

Valve, Auto-mechanical.—An inlet-valve used on the Duryea cars, which operates partly mechanically and partly automatically, and which is so constructed as to open when the pressure in the cylinder falls to atmospheric pressure, by the removal of the pressure of the spring against which all other types of automatic valves have to open.

Valve, Balloon.—A valve from one to three feet in diameter consisting of two semi-circular flaps of strong wood which are hinged to a support forming a diameter of a circular frame, and which open inward, and are kept closed by the upward pressure of springs. The valve is

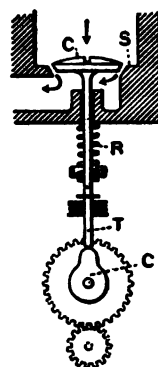
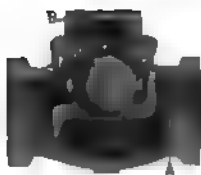


Fig. 2

opened by pulling what is called the "valve-line," a rope that descends to the car through the neck of the balloon. An improved valve, devised by M. Giffard, consists of a metallic disk four feet in diameter pressed against a wooden hoop by sixteen steel springs. It is opened by pulling the valve-line, which is attached to the center.

Valve, Ball.—A check-valve in which a ball, C (see figure), is mounted in a cage, B, and fits on a seat. The ball will seat, no matter how much it may be turned or moved, since its form causes it to seat equally well in any position. See Check-valve.



Valve-box.—A valve-chamber, q. v.

Valve, Bucket.—The valve in the piston of a suction-pump.

Valve, Butterfly.—A valve (see figure) consisting of two leaves, A and B, hinged to a rod, pivoted in a tube, C, and designed to reduce or diminish its section, and consequently the flow of gas through it. "Butterfly-valves" are frequently employed in carbureters to throttle the admission-pipes which supply the explosive mixture to the motor.



Valve-cage.—A frame-work, grating or box to prevent the escape of a valve-ball.

Valve-cam.—One of the cams which lifts the push-rod of an inlet or exhaust-valve.

Valve-cap.—A cover for protecting the inlet and exhaust-valves of a motor.

Valve-chamber.—The space or chamber in which a valve works, a continuation of the combustion-chamber itself, on a gasoline motor.

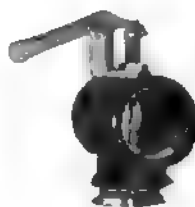
Valve, Check.—A valve which allows a flow of gas, air or fluid through it in one direction, but prevents any flow in the opposite direction. Among the forms of check-valve in automobile use are the ball-valve and the tire-valve.

Check-valves are called also "clack-valves," or "non-return valves."



Valve, Clack.—A flap or hinged valve, such as that of a pump.

Valve, Cut-off.—A valve that cuts off the entrance of steam to a cylinder before the piston reaches the end of its stroke.



Valve, Cut-out.—

A valve placed in the exhaust-pipe between the motor and muffler whereby the exhaust can be turned directly into the atmosphere without passing

through the muffler.

Valve, D.—A short slide-valve having the form of a D.

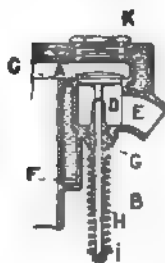
Valve-disk.—See Disk, Valve.

Valve, Drop.—A type of valve, called also a "swing valve," from the drop or flap, B (see figure). This drop is made of brass and is so turned that its shoulder fits closely to the edge of the bore. The drop swings on a lever, the top of which is pivoted to a stud, H. The pressure of the gasoline, water, steam or other fluid keeps the flap open, and when it ceases the latter falls. The inlet pressure is in the direction of the arrow.



Valve, Electric.—See Rectifier.

Valve, Exhaust.—A mushroom-valve with a conical seat (operated once in every two revolutions) to allow the escape of the exploded charge in a gasoline motor. The figure represents the exhaust-valve of such a motor. It consists of a "head," A, prolonged by a "stem," B, and which rests on a "seat," C, formed in the explosion-chamber of the motor and cooled by a circulation of water in the jacket, F. The valve-edge and seat are beveled so as to make an accurate fit. The valve is frequently made of nickel-steel, a metal which resists, without deformation, the high temperature (approaching dull red) of the exhaust-gases. Sometimes, the head alone is of nickel-steel, or even of pure nickel, and the steel stem is riveted to it. More rarely, the whole is of pure nickel. Below the valve there is a cavity, D, into which debouches the exhaust-pipe, E.



A screw-plug, K, situated above, permits of reaching the valve in order to dismount or grind it. The stem passes through a guide, G, of phosphor-bronze or of Siemens-Martin steel, screwed into the explosion-chamber, D. The spring, H, bears, on the one hand, against the guide, and, on the other, against a cup, I, held by a key. The valve, on lifting, uncovers an annular space beneath it for the passage of the gases, which flow, by D, through the tubulure, E. In order to

insure a maximum section, the valve should have a lift of $\frac{1}{4}$ of its smallest diameter.

Valve, Flap.—The same as Clack-valve, q. v.

Valve, Foot.—The valve at the bottom of a pump-barrel.



Valve, Gate.—A type of lift-valve consisting of a conical plug which is seated or unseated by turning its threaded stem by means of a hand wheel.

Valve-gear.—The mechanism which operates the valves of an engine.

Valve, Generator.—The same as mixing valve, q. v.



Valve, Globe.—A form of valve usually placed in a gasoline tank, to shut off gasoline from the carburetter.

Valve - gridiron.—A slide-valve provided with numerous cross-bars operating over many ports, so that a large area or opening with a minimum of motion may be secured

Valves, Grinding of.—See Grinding in.

Valve, Ignition.—See Ignition.

Valve, Induction.—The same as Inlet Valve, q. v.

Valve, Inlet.—A mushroom-valve which admits the explosive mixture into the combustion-chamber of a gasoline motor. It may be automatic or mechanical. There is another type of inlet-valve called a three-port inlet valve and consisting of three small atmospheric valves grouped within a circle. It is claimed that by such valves greater power is obtained.

Valve, Intake.—The same as Inlet and Admission-valve.

Valve, Lapped.—A slide-valve with a lap. See Lap.

Valve, Leaf.—The same as Flap Valve.

Valve, Lift.—A check-valve in which the plug is lifted by the pressure of a fluid entering from below, and which drops upon its seat and closes the opening as soon as the pressure ceases.

Valve-lifter.—A device for lifting a poppet-valve off its seat, when, for any reason, such an operation becomes necessary. (2) A valve push-rod, q. v.

Valve-line.—A rope attached to a balloon-valve, and used for opening it.

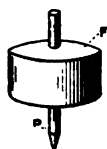
Valve, Lip.—Same as Poppet-valve.

Valve, Magnetic.—A valve (usually a poppet-valve) operated by the attraction of a magnet.

Valve, Mixing.—A device, called also a "generator valve," for carburetting gasoline for use in a gasoline motor. It differs in constructional details from a carburetter. See Carburetter.

Valve, Mushroom.—A conical-seated valve having a mushroom-shaped head provided with a stem and having an axial lift. It is the usual type of valves in explosion motors. See Valve, Poppet.

Valve, Needle.—A pointed rod, P, of metal (see figure), attached to the float, F, of a carburetter, and the point of which exactly fits into a suitably shaped hole, which it opens or closes by its motion. On steam-cars needle-valves are used for regulating the supply of oil to the burners.



Valve, Non-return.—The same as Check-valve.

Valve, Piston.—A valve consisting of a piston-like head which opens and closes ports by sliding to and fro past them.

Valve-pocket.—A passage at one side of the cylinder-head in which the inlet and exhaust-valves are placed.

Valve, Pop.—A steam carriage safety-valve, supposed to be so-called because the steam in lifting the valve from its seat usually makes a "pop" or sudden detonation, but merely an abbreviation of "poppet-valve," q. v.

Valve, Poppet.—A disk valve, called also "puppet-valve," "pop-valve," "potlid," "pot-valve," "mushroom" and "tappet-valve," borne on a stem and having a motion in a line with its axis.

Valve, Pot.—The same as Pop-valve.

Valve, Pressure.—A valve through which the pressure of the exhaust gas is used to feed gasoline to the carburetter, or oil to the sight-feed lubricators.

Valve Push-rod.—See Push-rod.

Valve, Reducing.—A valve which keeps the steam or gas pressure on its outlet side constant, notwithstanding the pressure on the other side is in excess of the required amount.

Valve, Regulator.—The same as throttle-valve.

Valve, Relief.—A valve to release the liquid air or gas from a vessel or pipe when it exceeds a given pressure. A safety-valve is a relief-valve used on steam-boilers. It is usually kept on its seat by a spring set at a determinate pressure. When this is exceeded, the valve lifts.

Valve-rod.—A name frequently applied to a valve-stem (q. v.); used in steam engineering by preference.

Valve, Rotary.—A valve, the partial or

entire rotation of which alternately uncovers or covers ports communicating with the source of power and the exhaust of an engine. It is used in the Corliss and Greene type of steam-engine and the Duryea type of gasoline motor.

Valve, Safety.—A valve of ordinary construction so arranged as to close a steam-pipe outlet under pressure of the weight or spring. The safety valves used on steam-cars are constructed on the same general principles as the spring valves used on locomotive or other boilers.

Valve, Screw.—A stop-cock of which the valve is actuated by a screw.

Valve, Screw-down.—A valve of which the stem has a thread by which it may be screwed down to its seat.

Valve-seat.—The edge of a port against or upon which a valve rests when closed.

Valve, Segment.—A steam-engine valve of which the seating surface is a portion of a cylinder.

Valve, Slide.—A sliding cut-off particularly employed in the distribution of steam engines. It is sometimes used as a regulating valve in pipes, as, for example, in carburetters.

Valve, Snifting.—An air-valve connecting with a cylinder in a steam-engine.

Valve, Spindle.—A valve, the motion of which is guided by a rod fixed to the movable portion and running through bearings.

Valve-spindle.—Same as valve-stem, q.v.

Valve-spring.—A compression spring that holds an inlet or exhaust valve to its seat.

Valve, Steam.—Any valve for controlling the flow of steam.

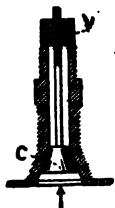
Valve-stem.—The rod, called also a spindle, to which a valve is attached, and through which it is operated.

Valve, Swing.—Same as drop valve.

Valve, Tail.—An air-pump valve in one form of condenser, opened by the steam entering the condenser, but closed by atmospheric pressure when a partial vacuum exists in the condenser. (2) A snifting-valve.

Valve, Tappet.—Same as poppet-valve.

Valve, Throttle.—See Throttle and Butterfly-valve.



Valve, Tire.—A non-return valve (see figure) allowing air to be pumped into a pneumatic tire, and preventing its return.

Valve, Trap.—The same as check-valve, q.v.

Valve-truer.—A tool by means of which the angles of valves can be re-turned by hand ready for grinding in.

Valve, Vacuum.—A reversed safety-valve opening inwardly by the pressure of the air when there is a negative pressure in the boiler.

Valve, Wing.—A valve provided with projections to guide it into its proper position.

Valvoline Oil Co.—11 Broadway, New York City. Mfrs. oils.

Vanadium.—A rare element coming between phosphorus and arsenic in the Periodic System. Atomic weight 51.2. In its physical properties it resembles a metal, but its chemical properties are those of a non-metal. It is obtained by reducing the dichloride in hydrogen at a bright red heat. So prepared, it is a crystalline grayish-white powder, which melts at 3035° F., and has a specific gravity of 5.5. The element is widely distributed, but always in small amounts, and apparently always in the form of vanadates.

Vanadium Steel.—See Steel, Vanadium.

Van Allen, W. C.—Mechanic St., Boonton, N. J. (Reo, Cadillac.)

Van Amberg, C. E.—118 N. Front St., Kingston, N. Y. (Maxwell.)

Van Auken-Cleavage Co.—Yonkers, N. Y. Mfrs. gasoline automobile motors.

Van Automobile Co.—4706 Washington Ave., St. Louis, Mo. (Cleveland, Stoddard-Dayton, Marmon.)

Van Benschoten, John.—273 Main St. and 14 Catherine St., Poughkeepsie, N. Y. (Mitchell, Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Lozier.) Garage; repairing; supplies.

Van Bilderbeck, H. W.—Jacob Van Campenshstraat 54, Amsterdam, Holland. Mfr. pneumatic tires.

Van Brunt, Henry H.—Pres. Henry H. Van Brunt Co., Sioux Falls, S. Dak.

Van Brunt Co., Henry H.—Sioux Falls, S. Dak. (Richmond.) Est. 1903. Cap. \$50,000. Henry H. Van Brunt, Pres.; Jno. P. Bleeg, Sec. and Mgr.

Vance, D. T.—Plumtree, N. C. Mfr. cut mica, sheet mica, mica washers.

Vance, Geo. B.—Gen. Mgr. The Turner Brass Works, Sycamore and Illinois Sts., Chicago, Ill.

Vancouver Auto & Bicycle Co.—Vancouver, Canada. (Oldsmobile.)

Vandecar Auto Co., W. D.—157 Ottawa St., Grand Rapids, Mich. (Reo, Glide.) Est. 1905. Cap. \$10,000. W. D. Vandecar, Gen. Mgr. Garage; 20 to 25 cars; repairing.

Vandegrift Automobile Co.—13th and Cumberland Sts., Philadelphia, Pa. Mfrs. gasoline automobiles.

Van den Plas.—6 rue des Drapiers, Brussels, Belgium. Mfrs. bodies.

Vanderbeek Tool Works.—Hartford, Conn. Mfrs. tools, universal joints.

Vanderbilt, H. M.—Suffern, N. Y. (Haynes.)

Vanderbilt, William Kissam, Jr.—Donor of the Vanderbilt Cup and member of the Van-



derbilt Cup Commission; president of the Long Island Motor Parkway, Inc. B. 1878. Drove a racing car in Europe and America with considerable success in the early and middle '90s, and has long been prominently

identified with the sport and pastime of automobiling. In 1904, at the Ormond-Daytona Beach races, he made one mile in 39 seconds and established records, at that time, for 5, 10, 20, 30, 40 and 50 miles.

Vandergrift Automobile Club.—E. L. Hoofring Sec., 172 Franklin Ave., Vandergrift, Pa.

Vandergrit Mfg. Co.—Shelbyville, Ind. Garage.

Vanderslice, C. M.—185 Hanover St., Pottstown, Pa. (Cadillac.)

Vandervelde.—36 rue des Foulons, Gand, Belgium. Mfr. motorcycles.

Vandervell & Co., C. A.—Warple Way, Acton Vale, London W., England. Mfrs. storage batteries.

Vanderwerf, J. W.—Vice-Pres. Nungesser Electric Battery Co., 3519 King Ave., Cleveland, O.

Vandever & Co., H. W.—807 Market Pl., Wilmington, Del. (Pope-Hartford.)

Van Dervoort, W. H.—Pres., Gen. Mgr., Designer and Purch. Agt. Moline Auto Co., East Moline, Ill.

Van Dorn & Dutton Co., The.—2714 E. 79th St., Cleveland, O. Mfrs. cut gears and gear cuttings. Cap. \$150,000. Est. 1897. J. H. Van Dorn, Pres.; F. Schneider, Vice-Pres.; W. H. Dutton, Sec. and Treas.

Van Dorn, Fred H.—31 E. Front St., Redbank, N. J. Garage.

Van Dorn J. H.—Pres. The Van Dorn & Dutton Co., 2714 E. 79th St., Cleveland, Ohio.

Van Duzen Kehm Motor Car Co.—Birmingham, Ala. (Rambler, Reo.)

Van Dyke, R. B.—Asst. Vice-Pres. American Locomotive Automobile Co., Providence, R. I.

Vane.—A plate, arm or blade projecting from an axis in order that it may be acted on by a moving current of air, water, etc., as in the case of a fan, centrifugal pump, etc.

Van Fenen & Co.—Billings, Mont. (Winton.)

Van Fleet Mfg. Co.—Joliet Ill. (Atlas.)

Van Horne, Chas.—Advt. Mgr. Jackson Automobile Co., Jackson, Mich.

Van Horn, Grant.—Findlay, O. Garage.

Van Hovenberg, Henry.—Engineer Adirondack Auto Co., Lake Placid, N. Y.

Van Kattengell, Edw.—Monmouth St. and Maple Ave., Redbank, N. J. Garage.

Vanlaethem, L.—4 rue du Débarcadère, Paris, France. Mfr. carbureters.

Van Leer, B. C.—Sec., Treas. and Hd. automobile supplies, etc., Keiser, Van Leer Co., 505-7 N. East St., Bloomington, Ill.

Van Meter, H.—Glen Ellen, Cal. (Wal-tham.)

Van Ness Garage.—Rear Van Ness House, Burlington, Vt. (Reo, Premier, Rapid.)

Van Nieuwenhoven und de Clerq.—376 rue Longue-d'Argile, Anvers, Belgium. Mfrs. motorcycles.

Vanpelt Auto Co.—26 S. Van Pelt, Philadelphia, Pa. Garage.

Vanse, W. A.—Officer The Quad Mfg. Co., 37 S. Scioto St., Columbus, Ohio.

Van Sicklen, Norton Harding.—B. La Fayette, Ind., Feb. 9, 1864. Ed. 2 yrs. public school. Mem. Clubs: Chicago A. C., Chicago Motor, Chicago Athletic Ass'n., South Shore Country, Fox River Country. Res., St. Charles, Ill. Used first car 1904. Formerly published Motor Age, The Bearings and The L. A. W. Bulletin. Recreations: Bicycling, automobiling.

Van Sicklin, W. L.—Sec. and Treas. Bailey Automobile Co., Birnie Ave., Springfield, Mass.

Vanstone, W. A.—Bridgeport, Conn. (Knox.)

Van Wart's Garages.—Van Brunt St. and 46 Palisade Ave., Englewood, N. J. (Reo, Maxwell, Studebaker, Crawford.) Est. 1903. Garage, 40 cars; repairing.

Van Wye, John E.—Willis, O. (Maxwell.)

Van Zandt, R.—Mgr. Los Angeles Branch Geo. P. Moore Co., Inc., 1005 S. Main St., Los Angeles, Cal.

Vapor.—An elastic fluid produced by liquid or solid bodies, at the ordinary temperatures and under atmospheric pressure. The passage of such bodies into a gaseous state constitutes vaporization. It takes place at every temperature with the majority of liquids, as well as with some solids which sublime before they liquefy (such as iodine, camphor, etc.). An ordinary liquid is vaporized in two different ways: by evaporation or slow production of vapors at the surface when it is abandoned to the open air; and "ebullition" or intense production of bubbles of vapor in the midst of the heated liquid. Under a given pressure, ebullition takes place in every liquid, at a constant temperature, its

temperature of ebullition, which may serve in certain cases to characterize it. At atmospheric pressure the temperature of ebullition of pure water is 212° F. or 100° C. Generally speaking, the boiling temperature is such that the maximum elastic force of the vapor is equal to the pressure which is exerted at the surface of the liquid (in the preceding case, at atmospheric pressure).

Vaporization.—The conversion of a liquid or solid body into a vapor, with or without the intervention of heat.

Vaporizer.—The same as "mixing valve." See Valve, Mixing, and Car-burette.

Vaporizer, Check-valve.—The same as generator-valve, q. v.

Vaporizer, Coil.—See Coil-vaporizer.

Vaporizing-nozzle.—The same as spray-nozzle. See Nozzle, Spray.

Varley, W. P.—Van Brunt St., Englewood, N. J. (Franklin.)

Varney, F. L.—Foreman of Rep. Shop and Stock Clerk Long Beach Auto Co., 142 Pacific, Long Beach, Cal.

Varney, W. M.—Prop. and Mgr. Long Beach Auto Co., 142 Pacific, Long Beach, Cal.

Varnish.—A transparent liquid composed mainly of oil, gum and turpentine. applied with a brush and giving a hard, glossy surface.

Vaseline.—A gelatinous, translucent, unctuous substance derived from crude petroleum and popularly known as "petroleum jelly." It is used as a lubricant and for preserving leather, etc. It is distinguished commercially as "red," "blonde" and "white."

Vauxhall Motors, Ltd.—Luton, England. Mfrs. gasoline automobiles (Vauxhall cars).

Veal, S. H.—Sec. and Purch. Agt. Cleveland Motor Car Co., Cleveland, O.

Védrine et Cie., A.—7 quai de Seine, Coubevoie, Seine, France. Mfrs. bodies.

Védrine, Société Anonyme des Voitures Electriques.—59 boulevard du Chateau, Neuilly, France. Mfrs. electric automobiles (Védrine cars).

Veeder, Curtis Hussey.—Pres. Veeder Mfg. Co. B. Allegheny, Pa., Jan. 31, 1862. Ed. Plattsburg, N. Y. high school, Lehigh University; graduated in 1886 with the degree of M. E. Vice-Pres. Post & Lester Co. Mem. Am. Soc. Mech. Eng., Franklin Inst., Am. Ass. Adv. Sci., Am. Geo. Soc., Nat. Geo. Soc., Am. Forestry Ass., League Am. Wheelmen since 1881, A. A. A., A. M. L., Aero C. A., Hartford, Musical Club of Hartford, University of Hartford, Laurentides Fish and Game Club of Quebec. Res., 40 Willard St., Hartford, Conn. Office, 20 Sargeant St., Hartford, Conn. In the trade since 1900. Used first car ("Mobile") in 1900. Rec-

reations: Bicycling, automobiling, trout fishing.

Veeder Mfg. Co.—Cor. Garden and Sargeant Sts. Hartford, Conn. Mfrs. cyclometers, odometers, tachometers, tachodometers, counters, fine castings. Member M. & A. M. Cap. \$12,000. Est. 1895. C. H. Veeder, Pres.; D. J. Post, Treas.; H. W. Lester, Sec.

Vehicle Apron & Hood Co.—Columbus, O. Mfrs. storm aprons and curtains, automobile covers, robes, lamp covers, tire cases, tire shoes, tire sleeves, tool bags, wearing apparel, leggings.

Vehicle Specialty Co.—32 Union Pl., Hartford, Conn. Mfrs. washing apparatus.

Vehicle Storage Co.—6014 Rodman St., Pittsburg, Pa. Garage.

Vehicle Top & Supply Co.—900 Cass St., St. Louis, Mo. Mfrs. storm aprons and curtains, lamp covers, tire cases, automobile tops.

Veit und Co., W. F., Wagen und Karosseriefabrik.—Urbanstrasse 67, Berlin, Germany. Mfrs. bodies.

Velie, C. P.—Minneapolis, Minn. Garage.

Velo, Angel.—Havana, Cuba. (Queen.)

Velocimeter.—A device for measuring speed.

Velocity.—See Speed.

Velofabrik Liesthal.—Liesthal, Switzerland. Mfrs. motorcycles (Oris).

Velograph.—An instrument for showing the time when each start and stop of a car occurs, and the distance between stops, and permitting of determining the speed of the vehicle and the distance covered.

Venango Auto Station.—Franklin, Pa. (White.)

Vent, Eugene.—Mexico City, Mex. (Royal.)

Ventilated Cushion & Spring Co.—Jackson, Mich. Mfrs. cushion springs, ventilated cushions, complete trimmings. Cap. \$45,000. Est. 1906. S. F. Randolph, Jr. Pres.; O. S. Tweedy, Treas.; P. W. Hood, Sec.; L. A. Young, Mgr. Trimming and Cushion Dept.

Verdon, E.—20 rue Brunel, Paris, France. Mfrs. solid tires.

Verea, Lic Jarrer.—Quadalajara, Mex. Garage.

Vereinigte Berlin Frankfurter Gummiwarenfabrik.—Gelnhausen, Germany. Mfrs. pneumatic and solid tires.

Vereinigte Dürener Treibriemen fabriken.—Düren, Germany. Mfrs. non-skids.

Vereinigte Gummiwarenfabriken Harburg - Wien.—Harburg-am-Elbe, Germany. Mfrs. pneumatic tires.

Vereinigte Gummiwarenfabriken Harburg - Wein.—Vienna, Austria. Mfrs. pneumatic tires.

Vereinigte Hanfschlauch und Gummi-

warefabriken Actiengesellschaft.—Gotha, Germany. Mfrs. pneumatic tires.

Verity, Geo. M.—Vice-Pres. De Luxe Motor Car Co., Clark and Jefferson Ave., Detroit, Mich.

Vermorel, V.—Villefranche, Rhone, France. Mfr. motorcycle motors.

Vermot, Ch.—Chatenois, Haut-Rhin, France. Mfr. springs.

Verste.—A Russian measure of length equal to 1.06 km=.65 mile.

Verstraete Mfg. Co., Ed.—421 Clinton St., Milwaukee, Wis. Mfrs. circulating pumps, clutches.

Vesta Accumulator Co.—1334 Michigan Ave., Chicago, Ill. Mfrs. storage batteries, horns, lamps.

Vestal Shock Absorber Co.—Baum and Whitfield Sts. E. E., Pittsburg, Pa. Mfrs. shock absorbers.

Veuniss, E. D.—Pres. The Lee Mfg. Co., Conners St., Port Huron, Mich.

Veziel, Fouanon et Cie.—45 rue Jean-Macé, Suresnes, France. Mfrs. wood wheels.

Vezzoni Fabbrica Italiana de Pneumatici, E.—15 via Torino, Milan, Italy. Mfrs. pneumatic tires.

Vibration.—In mechanics, a term usually applied to an intermittent or irregular motion which is generally of an undesirable character, and is rarely used to describe any regular motion of the true character of vibrations.

Vibrator.—See Trembler.

Vibrator-coil.—The same as trembler-coil, q. v.

Vichie, James.—Director Hercules Auto Specialty Mfg. Co., 115 Dearborn St., Chicago, Ill., and 936 Denver Ave., Los Angeles, Cal.

Vick, V.—Houston, Tex. Garage.

Vicory, Chas. A.—R. F. D. 2, Hornet, Mo. (Holsman.)

Victor Auto Storage Co.—147-49 W. 55th St., New York City. Est. 1902. Cap. \$10,000. J. R. Kirkpatrick, Pres.; Wm. M. Haradon, Sec., Treas. and Gen. Mgr. Garage, 100 cars; repairing.

Victor Auto Tire Repair Co., The.—220 Madison St., Passaic, N. J. Repairing. Mfrs. inner tubes.

Victor Automobile Co.—809 Massachusetts Ave., Indianapolis, Ind. (Marvel, Dragon.)

Victor Automobile Mfg. Co.—171 Carroll St., St. Louis, Mo. Mfrs. gasoline automobiles.

Victor Electric Co.—55-61 Market St., Chicago, Ill. Mfrs. portable electric buffers, polishing outfits, air compressors, portable electric tire inflating outfits.

Victor Factories, The.—Broadway and 65th St., New York City. Mfrs. wind shields, slip covers, dust hoods, automobile tops. C. H. Schub, Lessee.

Victor Metals Co.—29 Broadway New York City. Mfrs. metal trimmings.

Victor Rubber Co., The.—Springfield, O. Mfrs. rubber mats, matting and bow spreaders. Cap. \$50,000. Est. July 2, 1904. H. H. Durr, Pres.; J. S. Holliday, Sec.; H. J. Robben, Treas.

Victor Shock-Absorber Co.—1937 Broadway, New York City. Mfrs. and jobbers shock absorbers. Est. Jan., 1907. E. S. Aker, Pres.; Theo. B. Nisbet, Treas.

Victor Supply Mfg. Co.—101 W. 66th St., New York City. Est. April, 1907. Supply house. Harry A. Robinson and A. M. Reynaud, officers. I. J. Reynaud, Mgr.

Victoria.—An open carriage for two, with a seat for a servant, either in front or behind the main seat and elevated above it. A "victoria" is always fitted with a special folding leather top known as a "victoria top." It is sometimes called a "mylord."

Victoria Phaeton.—See Duc.

Victoriawerke Actiengesellschaft.—Nürnberg, Germany. Mfrs. motorcycles.

Victory Motor Car Co.—San Jose, Cal. Mfrs. gasoline automobiles. (Sunset cars.)

Vie au Grand Air, La.—Pub. at 9 ave. de l'Opera, Paris, France.

Vie Automobile, La.—Pub. at 49 quai des Grands-Augustans, Paris, France.

Vie Illustrée, La.—Pub. at 122 rue Raumur, Paris, France.

Vigneaux, C.—5 rue Bacon, Paris, France. Mfrs. shock absorbers.

Vigo et Cie.—24 via Maria Vittoria, Turin, Italy. Mfrs. wearing apparel, coats.

Viking Co., The.—801 Boylston St., Boston, Mass. Mfrs. gasoline commercial automobiles.

Villeneuve, U.—Aubenas, Ardèche, France. Mfrs. wearing apparel fur coats.

Vim Motor Co., The.—Sandusky, O. Mfrs. gasoline marine motors.

Vincent Valve Co., The.—Sandusky, O. Mfrs. brass, bronze, aluminum and copper castings, throttle valves.

Vinet Amovile, La Jante.—2 ave de Messine, Paris, France. Mfrs. detachable rims.

Vinet et Boulogne.—61 rue de Villiers, Neuilly, Seine, France. Mfrs. wood rims, bodies and tops.

Vinot et Deguingand.—29 quai National, Puteaux, Seine, France. Mfrs. gasoline automobiles (Vinot cars).

Virginia Automobile Co.—223 W. Broad St., Richmond, Va. Garage.

Virginia East Coast Association.—J. Roy Collins, Sec., Norfolk, Va.

Virginia Motor Car Co.—Roanoke, Va. (Maxwell.)

Virtue & Pound Mfg. Co.—Owatonna, Minn. Mfrs. transmission gears, gasoline marine motors.

Vis-a-Vis.—An open carriage with side entrance, having a front seat for the

driver, and inside two single seats placed facing each other.

Viscosimeter.—An instrument used for comparing viscosities.

Viscosity.—The property possessed by a liquid of resisting deformation. The practical significance of viscosity is very great with respect to lubricants, all of which possess a perceptible degree of viscosity. The viscosity is measured by the time which a known volume of the oil takes at a given temperature to flow through an aperture of known form and dimensions under a known mean pressure.

Viscosity Oil Co.—21 River St., Chicago, Ill. Mfrs. oils.

Vise.—A tool used for holding small pieces of work while they are being operated upon, and of which there are many forms and sizes. It consists of a pair of jaws which can be made to recede from or approach each other by means of a screw. Vice-jaws are usually striated in order to keep the work from slipping. When the piece to be operated upon is delicate or the metal not very hard, a clamp of lead, copper or wood is usually inserted between the jaws in order to protect it from injury.

Visor Knitting Co.—2016 Whirlpool Ave., Niagara Falls, N. Y. Mfrs. wearing apparel, mufflers.

Vitriol, Blue.—See Copper Sulphate.

Vitz, Clarence H.—Auditor Locke Regulator Co., 76 North St., Salem, Mass.

Vivax Storage Battery Co.—2228 Michigan Ave., Chicago, Ill. Mfrs. primary and storage batteries.

Vivinus, Société Anonyme des Ateliers.—54 rue Destonvelles, Brussels, Belgium. Mfrs. gasoline automobiles (Vivinus cars).

Voegtey, Chas.—Tecumseh, Mich. (Cadillac.)

Vogel, H. G.—Vice-Pres. Harry S. Hought Co., 63rd St. and Broadway, New York City.

Vogel und Prein.—Hagen im Westphalia, Germany. Mfrs. differential and steering gears.

Voigt, Emile Victor.—Manufacturer. B. Lille, France, Dec. 8, 1871. Ed. Paris, University. Director, Charron Limited. Mem. Cercle Artistique et Littéraire, A. C. de France, Yacht Club de France, Calumet, etc. Res., Bouchevilliers Eure. France. Office, Puteaux, Seine, France and 1849 Broadway, New York

City. In the trade since 1897. Used first car 1896; first yacht 1892.



Vogt Mfg. & Coach Lace Co.—322-4 St. Paul St., Rochester, N. Y. Mfrs. cloth and carpet trimmings.

Vogt.—30 rue du Vieux-Mayeur, Liege, Belgium. Mfrs. bodies.

Voiturette.—From the view-point of their classification, under the regulation of the Automobile Club of France and of clubs of other countries, a voiturette is a vehicle of which, when empty, the weight does not exceed 1000 pounds. By empty is meant without water, oil, gasoline or accumulators. Motors having ignition by magneto are allowed a further weight of 13 pounds. From a practical view-point, a voiturette is a small, very light and very simple car (single-cylinder motor), with seats for two side by side, and occasionally for three, afforded by a spider. The voiturette is a vehicle for utility or pleasure, but not for sport. It is not supposed to run more than from 16 to 25 miles an hour nor to carry a greater weight than that for which it was intended.

Volkel Wm.—Perrysville, Ind. (Holzman)

Volker und Prügel.—Obernberg-am-Main, Bavaria, Germany. Mfrs. automobile motors, motorcycles (Elsava).

Volkman, C. F.—Nappanee, Ind. Garage.

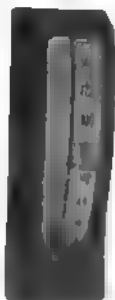
Volt.—Unit of measure of the difference of potential. See Potential.

Volta Storage Battery Co.—Monadnock Bldg., Chicago, Ill. Mfrs. storage batteries.

Voltage.—An improper expression to designate the difference of potential between two terminals. See Electromotive Force and Potential.

Voltaic Cell.—See Cell, Primary.

Voltmeter.—An apparatus designed to effect the decomposition of a liquid by means of an electric current. This must not be confused with "Voltmeter."

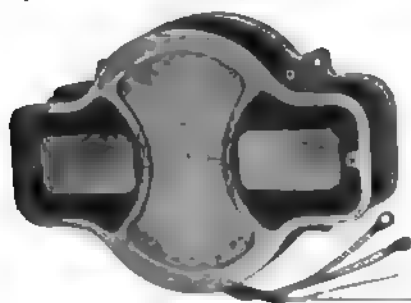


Voltmeter.—An apparatus for directly measuring voltage or difference of potential. See Ignition.

A voltmeter is indispensable for ascertaining the state of charge of a battery of storage-cells. For automobile use pocket-voltmeters are made.

The chief difference between a voltmeter and an ammeter (q. v.) is that the active coil in the voltmeter is in series with a resistance, while in the ammeter it is connected across the terminals of a shunt-block. For motor-car use a voltmeter and an ammeter are usually mounted on one base with their

graduated scales near enough together to permit of the battery conditions being



quickly read. The accompanying figure shows a type of voltmeter employed on electric vehicles. Some styles of such instruments have the index scales side by side instead of end to end.

Voltmeter, Electrostatic.—A voltmeter depending upon the principle of the electrometer (q. v.), which itself forms a voltmeter applicable to many purposes. Voltmeters of this type are much used in alternate current work.

Voltmeter, Hot-wire.—An instrument in which the expansion of a thin wire of high resistance, when heated by the passage of a current, is caused to move a pointer. Such a voltmeter is equally applicable for continuous or alternating currents.

Voltmeter, Magnetic.—An instrument which, in principle, is a high resistance galvanometer, and is constructed either with a fixed coil and moving magnet, or with a fixed magnet and moving coil. A type of voltmeter suitable for continuous currents only.

Voltz, Daniel W.—Treas. Limousine Carriage Mfg. Co., Mich. Ave. and 35th St., Chicago, Ill.

Voltz, Edward C.—Pres. Limousine-Carriage Mfg. Co., Mich. Ave. and 35th St, Chicago, Ill.

Volumes, Metric.—

Name	Litres	Cub. In.	Cub. Ft.	Gallons
Millilitre	0.001	0.061	.....	.00022
Centilitre	0.01	0.61	.00035	.0022
Decilitre	0.1	6.1	.0035	.022
Litre	1	61.02	.035	.220
Decalitre	10	616.28	.353	2.200
Hectolitre	101	6,102.35	3.53	22.009
Kilolitre	1,000	.....	35.317	220.096
Myrialitre	10,000	.....	353.17	2,200.967

Volute Spring.—See Spring, Volute.

Von, A. M.—Pres. and Mgr. Chelsea Auto Storage Co., 516-520 W 37th St., New York City.

VonderLinden, H.—52 Market St., Poughkeepsie, N. Y. (Rambler).

Von Hamm, C. C.—Sec. Treas. and Mgr. Von Hamm Young Co., King and Bishop Sts., Honolulu, Hawaiian Islands.

Von Hamm Young Co.—King and Bishop Sts., Honolulu, Hawaiian Is. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, White, Autocar, Maxwell, Buick, Stoddard-Dayton, Peerless.) Est. 1899. Cap. \$100,000. Alex. Young, Pres.;

A. A. Young, Vice-Pres.; C. C. Von Hamm, Sec. Treas. and Mgr. Garage, 50 to 60 cars. Repairing.

Von Wyck Machine Tool Co.—Cincinnati, O. Mfrs. special automobile machinery

Voorhees Rubber Mfg. Co.—18-40 Bostwick Ave., Jersey City, N. J. Mfrs. cellular tires.

Voris, Edwin F.—Pres. The Auto Shop Co., 731 Vincent Ave. N. E., Cleveland, Ohio.

Vosburgh, A. C.—Sec. and Treas. New Process Raw Hide Co., 500-14 Plum St., Syracuse, N. Y.

Voss, Walter.—Sec. and Treas. Lobec Pump and Machinery Co., Cor. Terrace and Erie Sts., Buffalo, N. Y.

Vrard et Cie.—12 bvd. d'Asnieres, Neuilly-sur-Seine, France. Mfrs. gasoline automobiles (Stabilia).

Vrooman Bros.—1259 State St., Schenectady, N. Y. (Elmore, Waltham.) Est. 1905. Garage, 35 cars; repairing.

Vuille, Chas. A.—819 Washington St., Huntington, Pa. (Cadillac, Franklin.) Mfrs. hydrometers.

Vulcan Schweiz-Automobil und Motorbootfabrik Actien Gesellschaft.—Alstetten-Zürich, Switzerland. Mfrs. gasoline automobiles. (Vulcan cars.)

Vulcan Tire Repair Co.—226 W. 53rd St., New York City. Vulcanizing.

Vulcanite.—Rubber mixed with a very large percentage of sulphur and exposed for a considerable time to a high temperature. (2) A name sometimes applied also to vulcanized fiber. See Fiber, Vulcanized.

Vulcanization.—An operation which consists in combining sulphur with natural rubber in order to modify its properties; particularly in order to prolong the life of its elasticity and to prevent it from softening by heat. See Sulphur.

Vulcanized Fiber.—See Fiber, Vulcanized.

Vulcanizer.—A portable apparatus by means of which a comparatively inexperienced person can make repairs upon either the tube or shoe of his tire. There are numerous forms in the market, some of them so small that they can be screwed directly upon the wheel and a cut be repaired in a shoe without removal of the tire, the entire process consuming but little more time than it takes to put on a patch. One of the most ingenious vulcanizers in use consists of a flat or concave metal core heated by electricity, but the improbability of getting an electrical current just when it is needed restricts this apparatus to the repair shop or garage. One of the earliest of portable vulcanizers was made both for steam and dry heat. While dry heat vulcanizers can be made to do the work very well they usually require careful

watching; so the great majority of vulcanizers are made for steam heat. These generally carry a pressure-gauge, a thermometer and a poppet-valve, which blows off above the critical temperature. Many persons find hot vulcanizing too inconvenient and prefer the various cold-cure processes now on the market. With such a process, it generally suffices to cement the parts first, and, when dry, to

brush the surfaces with a patent solution and then press them together, when the vulcanization will be accomplished.

Vulpes, Société Anonyme des Automobiles.—170 bvd. National, Clichy, Seine, France. Mfrs. gasolene automobiles (Vulpes cars).

Vyzelaar & Van den Bergh.—63 Amsterdam, Haarlemmer Hottuin, Holland. Mfrs. pneumatic tires.

W

W.—Symbol for "electric energy."

W.—An abbreviation of "watt."

W.—Symbol for "tungsten" or "wolfram."

W, h.—An abbreviation of watt-hour.

W, w.—Symbol for work.

W. C. P. Automobile Supply House.—1739 Broadway, New York City. Est. 1903. C. F. Wyckoff, Pres.; A. W. Church, Sec.; E. S. Partridge, Vice-Pres.; John G. Craig, Treas.; Oscar Warner, Gen. Mgr.; R. H. Weaver, Mgr. Supply house.

Wabash Gear Works.—Terre Haute, Ind. Mfrs. differential gears and metal gear wheels.

Wabash Auto & Electric Co.—Terre Haute, Ind. (Jackson.)

Wacheux.—84 rue de 4 Coins, Calais, France. Mfrs. motorcycles.

Wachtell & Sons, C. S.—Muncie, Ind. (Cadillac.)

Wachusett Automobile Club.—L. H. Greenwood, Sec., Gardner, Mass.

Wadhams Oil Co.—Milwaukee, Wis. Mfrs. oils.

Waffard, A.—19 rue Bois-Gotha, Liege Belgium. Mfr. Eole motorcycles.

Wagner Electrical Mfg. Co.—St. Louis, Mo. Mfrs. ammeters and voltmeters, charging apparatus, electric generators, and electric motors.

Wagner, Fred.—Pres. Fiss, Doerr & Carroll Co., 153 E. 24th St., New York City.

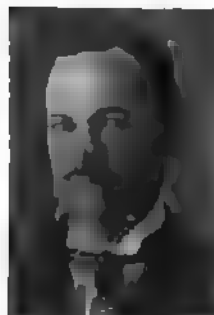


Photo by Spencer and Wells

Wagner, Fred J.—Formerly Eastern rep. Motor Age. B. Covington, Ky., June 13, 1869. Ed. public schools. Official starter of all important races and contests in the United States.

Wagner, Geo., Jr.—Sec. and Treas. Trebert Gas Engine Co., 35-7 Ford St., Rochester, N. Y.

Wagner, H. G.—17th and U Sts. N. W., Washington, D. C. (Winton.)

Wagner, John.—339 Main St., Streator, Ill. (Buick.)

Wagner, Jonas S.—Pres. Light Mfg. & Foundry Co., 509 Queen St., Pottstown, Pa.



Wagner, Louis.

—A famous French racing driver, whose most notable exploit was the winning of the 1906 Vanderbilt cup race. B. in Paris Nov. 2, 1881. He has also competed over the Ardennes Circuit in Belgium, which he won, in the

voiturette class in 1903. He is in the employ of Darracq et Cie.

Wagner Motor Cycle Co.—327 St. Peter St., St. Paul, Minn. Mfrs. motorcycles.

Wagner und Co., Wagenfabrik.—Brandenburg, Germany. Mfrs. bodies.

Wagonette.—A general term applied to all vehicles provided with two longitudinal seat-boards, where the passengers sit face to face, and where the entrance is from the rear. The form, shape and size of the body, the form and arrangement of the driver's seat, and the presence or absence of a top, may vary the style infinitely, but the vehicle is still a true wagonette so long as the above-named characteristics remain. The French term, "char-i-bancs"—literally, a carriage with bench-seats—is the equivalent of the English term "wagonette" in this technical sense.

Wahlman, S. J.—Ishpeming, Mich. (Pope.)

Wahrer, Roofus.—Wapokoneta, O. Garage.

Wainwright, L. M.—Pres. Diamond Chain & Mfg. Co., Indianapolis, Ind.

Waist.—Of a vessel, the uppermost part of the top-sides.

Wait & Co., G. H.—Humberston Gate, Leicester, England. Mfrs. gasoline automobile (Clyde).

Waite, F. E.—Oshkosh, Wis. (Mitchell.)

Waite, Geo. W.—Albany, N. Y. (Elmore.)

Waite, Henry Randall.—Pres. and Treas. Kero Steam Co., (Waite & Son Co.), 102 Fulton St., New York City. Factory, East Orange, N. J.

Waite, Winthrop.—Sec. Kero Steam Co. (Waite & Son Co.), 102 Fulton St., New York City. Factory, East Orange, N. J.

Wakefield, J. E.—89 Exchange St., Worcester, Mass. Mfr. wrenches.

Wakeman, W. R.—Dalton, N. Y. (Waltham.)

Walburg, H.—Sec. Reading Standard Co., Water St., Reading, Pa.

Walburn, Thos.—Supt. Ford Motor Co., Detroit, Mich.

Waldemann, C. G.—Head of Adjustment Dept. Continental Caoutchouc Co., 43 Warren St., 2100 Broadway, New York City.

Walden Mfg. Co.—65 Beacon St., Worcester, Mass. Mfrs. wrenches.

Waldon, S. D.—Sales Mgr. Packard Motor Car Co., Detroit, Mich.

Wale.—A wide plank at certain portions of a boat's side extending from stem to stern and describing the curve of the strakes.

Wales & Son.—York, Eng. Mfrs. wood wheels.

Walker & Co., E. C.—1913-23 Logan St., Louisville, Ky. Mfrs. flash boilers, kerosene and gasoline burners, steam condensers, fuel regulators, water regulators, thermostats, throttle valves, simple and compound steam engines, steam fittings and valves. Est. 1900. E. C. Walker, Pres. and Mgr.; E. C. Jacobsen, Sec. and Treas.

Walker & Co., Samuel.—Mexico City, Mex. Garage.

Walker Carriage Co.—Merrimac, Mass. Mfrs. wood and metallic bodies.

Walker, E. C.—Pres. and Mgr. E. C. Walker & Co., 1913-23 Logan St., Louisville, Ky.

Walker, Geo. L.—Vice-Pres. Buick Motor Co., Flint, Mich.

Walker, J. E.—Adv. Mgr. H. H. Franklin Mfg. Co., 302 S. Geddes St., Syracuse, N. Y.

Walker, J. G.—San Angelo, Tex. (Buick.)

Walker, John.—Foreman Rep. Dept. Michaelis-Middlekauf Auto Co., 1650 54 Glenarin St., Denver, Colo.

Walker Motor Car Co.—109 Fort St., Detroit, Mich. Garage.

Walker, Percy.—Wenatchee, Wash. Garage.

Walker, Rufus, Jr.—Sec. and Treas. Moline Auto Co., East Moline, Ill.

Walker, Mrs. W. H.—Burlington, Vt. (Elmore.)

Walking-beam.—See Beam, Walking.

Walkley, L. V.—Pres. H. D. Smith & Co., Plantsville, Conn.

Wall, Ltd., A. W.—Birmingham, England. Mfrs. Roc motorcycles.

Wall, W. G.—Designer National Motor Vehicle Co., E 22nd St., Indianapolis, Ind.

Wallace & Sons, V.—Salisbury, N. C. (Pope-Hartford.)

Wallace Barnes Co., The.—Bristol, Conn. Mfrs. machinery springs, seat springs.

Wallace Bros. Co.—46-48 Main St., New Rochelle, N. Y. (Maxwell.) Supplies; garage; repairing. Garage at 245 Huguenot St.

Wallace Buggy Co.—Chattanooga, Tenn. (Stoddard-Dayton, Elmore.)

Wallace Co., Hugh.—Boulevard and Orleans St., Detroit, Mich. Mfrs. automobile robes and miscellaneous wearing apparel.

Wallace, E. N.—Main and Carlisle Sts., Hemlock, Ind. (Haynes.)

Wallace, G. S.—Port Allegany, Pa. (Maxwell.)

Wallace, R. L.—San Jose, Cal. (Waltham.)

Wallace, W. M.—616 18th St. N. W., Washington, D. C. Mfrs. torch heaters.

Walley, Wm. C.—Morris, Ill. (Rambler.)

Wallis, A. C.—Mgr. Hydro-Palm Soap Co., 22 Union St., Boston, Naponsee District, Mass.

Wallwork & Co., Ltd., Henry.—Roger St., Manchester, England. Mfrs. non-skids.

Wallwork, Roughsedge.—Proprietor at Manchester, England, The Wells Light Mfg. Co., 44-46 Washington St., New York City.

Walsh, Robert.—Charles City, Ia. (Rambler.)

Walter & Sons, N. C.—194 William St., New York City. Mfrs. monograms and mufflers.

Walter Auto Co., The.—Trenton, N. J. and 59-61 W. 66th St., New York City. Makers of the Walter Car; first marketed in 1902. Eight models made since. Fred. Kuser, Pres.; J. L. Kuser, Treas.; R. V. Kuser, Asst. Treas.; W. A. Roebeling, 2d. Sec.; E. Blanche, Designer. Branches: Boston, Mass. F. Smith, Mgr.; Brooklyn, N. Y., Walter Blaisdel, Mgr.; International Motor Car Co., E. S. Lea, Mgr.; Philadelphia, Pa.; Park Garage Co., Pittsburg, Pa.; Walter Auto Co., of New York, Fred. Kuser, Mgr.

Walter, Frank.—Montgomery Hall, Staunton, Va. (Autocar.)

Walter, W.—Supt. Walter Auto Co., Trenton, N. J., and 59-61 W. 66th St., New York City.

Walters & Burger.—Woodstock, Ill. (Rambler.)

Walters, John.—Pres. Bryant & Berry Co., 34 W. Atwater St., Detroit, Mich.

Waltham Brass & Aluminum Co.—

Waltham, Mass. Mfrs. brass, bronze, aluminum and copper castings.

Waltham Mfg. Co.—1615 Broadway, cor. 49th St., New York City. (Waltham.) Est. May 1, 1905. O. G. Bechtel, Mgr. Repairing.

Waltham Mfg. Co.—Waltham, Mass. Makers of the Waltham-Orient cars and buckboards; first marketed in 1901. Harrison Williams Pres.; M. P. Clough, Treas.; E. S. Church, Mgr.; E. P. Chalfant, Sales and Advt. Mgr.; F. D. Howe, Designer, E. F. Whittaker, Purch. Agt. Branches: Chicago, Ill., 433 Wabash Ave., J. H. Toole, Mgr. New York City, 1615 Broadway, O. G. Bechtel, Mgr.

Waltham Motor Car Co.—443 Wabash Ave., Chicago, Ill. (Waltham.)

Waltke & Co., Wm.—Grand and 2nd Sts., St. Louis, Mo. Mfrs. hand soap.

Walton, H. E.—Sec. and Gen. Mgr. Okey Motor Car Co., W. Broad and Kimball Sts., Columbus, O.

Walton-Van Huffel Mfg. Co.—244 S. Chambers Sts., Galesburg, Ill. Garage.

Walworth Mfg. Co.—128-136 Federal St., Boston, Mass. Mfrs. and dealers, wrenches and other tools. Cap. \$400,000. Est. 1842. Inc. 1872. Wallace L. Pierce, Pres.; George B. Little, Vice-Pres.; George H. Graves, Treas.; Geo. T. Coppins, Sec.; A. M. Mattice, Gen. Mgr. of works.

Walz, C. H.—Mgr. Accessory Dept. and Gen. Mgr. Jas. L. Gibney & Bro., 211-213 N. Broad St., Philadelphia, Pa.

Wanamaker, John.—Philadelphia, Pa., and New York City. (Merkel.)

Wanckel, Manfred.—640 Madison Ave., New York City. Mfrs. wearing apparel, caps.

Wanderer Fahrradwerke.—Schönau bei Chemnitz, Germany. Mfrs. motorcycles and tricars (Wanderer).

Wanner et Cie.—67 ave de la Republique, Paris, France. Mfrs. lubricators.

Wapakoneta Wheel Co.—Wapakoneta, O. Mfrs. wooden wheels.

Ward & Co., E. S.—Newark, N. J. Mfrs. leather.

Ward & Goldstone.—Salford, Manchester, England. Mfrs. electric lamps, gauges.

Ward & Son, Edgar T.—25 Purchase St., Boston, Mass. Jobbers in tubing, seamless steel, wire springs.

Ward, A. B.—Vice-Pres. New Jersey Automobile Co., 855-7 Springfield Ave., Newark, N. J.

Ward, E. W.—Head of Accounting Dept. Worcester Pressed Steel Co., North and Barber Aves., Worcester, Mass.

Ward, Frank.—404 S. Water St., Rockford, Ill. (Winton.)

Ward, Harry.—Vice-Pres. Coppock Motor Car Co., Decatur, Ind.

Ward, J. A.—Sec. and Treas. Monarch Motor Car Co., Chicago Heights, Ill.

Ward, Wm. S.—Supt. H. D. Smith & Co., Plantsville, Conn.

Ward's Auto Garage.—23 Lafayette St., Saratoga, N. Y. Garage.

Ware & Floren.—Lakota, N. Dak. (Premier, Reo.)

Warfel & Arbuckle.—1601 State St., Erie, Pa. (Waltham, Pope-Waverley.) Est. 1880. Repairing.

Warminster Motor Co., Ltd.—Warminster, England. (Wayne.)

Warner & Co., C. P.—1502 Michigan Ave., Chicago, Ill. (Moline.)

Warner, A. P.—Vice-Pres. and Mgr. Warner Instrument Co., 2022 Roosevelt Ave., Beloit, Wis.

Warner, A. R.—Sec. The White Co., Rose Bldg., Cleveland, O.

Warner, C. H.—Sec. and Treas. Warner Instrument Co., 2022 Roosevelt Ave., Beloit, Wis.

Warner Clutch Co.—1461 Michigan Ave., Chicago, Ill. Mfrs. clutches, brakes.

Warner Co., The C. S.—Niagara Falls, Canada. Custom house brokers, insurance brokers and attorneys.

Warner Gear Co.—Muncie, Ind. Mfrs. steering apparatus, differential gears, transmission gears and metal gear wheels.

Warner, G. E.—438 S. Salina St., Syracuse, N. Y. (Thomas Flyer.)

Warner Instrument Co.—2022 Roosevelt Ave., Beloit, Wis. Mfrs. "Autometer" speed indicators. Est. 1903. Mem. M. & A. M. Jas. Barclay, Pres.; A. P. Warner, Vice-Pres. and Mgr. and C. H. Warner, Sec. and Treas.

Warner, Oscar.—Sec. and Treas. The Crescent Parts Co., 1743 Broadway, New York City.

Warner Pole & Top Co.—1655 Central Ave., Cincinnati, O. Mfrs. storm aprons and curtains, foot rests, tool bags and automobile tops.

Warnock Co., Wm.—324 4th St., Sioux City, Ia. (Ford, Rambler, Maxwell.)

Warp.—To move with a line attached to a buoy, etc.

Warren Auto Exchange.—38 W. 62nd St., New York City. Garage.

Warren Axle & Tool Co.—Warren, Pa. Mfrs. wrenches.

Warren, C. B.—Sales and Adv. Mgr. Haynes Automobile Co., Main St., Kokomo, Ind.

Warren, C. H.—Purch. Agt. Baker Motor Vehicle Co., 80th St. N. W., Cleveland, O.

Warren, Geo. R.—Main St. and Middle Alley, Slatington, Pa. (Waltham.)

Warren, H. C.—Pres. and Treas. The Mutual Machine Co., 25 Wells St., Hartford, Conn.

Warren, H. P.—Pres. The F. E. Bowlers Co., Inc., New Haven, Conn.

Warren Leather Goods Co.—80 Austin St., Worcester, Mass. Mfrs. automobile trunks.

Warren Mfg. Co.—Warren, Mass. Mfrs. gasoline automobile motors.

Warren Motor Car Co.—Warren, O. (Ford.)

Warren, Prescott.—Sales Mgr. Stanley Motor Carriage Co., Newton, Mass.

Warren, W. A.—Pittsburg, Pa. (Dolson).

Warren, W. F.—214 Washington St., Jamestown, N. Y. Garage.

Warren's Auto Garage.—Northampton, Mass. Garage.

Warsaw Auto Garage & Machine Works.—Warsaw, N. Y. (Winton, Cadillac, Autocar).

Warsaw Garage Co.—208 Indiana St., Warsaw, Ind. (Ford, Premier, Marmon). Est. 1906. W. H. Eggleston, Mgr. Garage, 5 cars Repairing.

Warwick Cycle & Auto Co.—Springfield, Mass. Mfrs. motorcycles.

Warwick & Co., J. G.—5971 Center Ave., Pittsburg, Pa. (Jewel).

Wasatch Auto Co.—Salt Lake City, Utah. (Thomas.)

Wasem & Beals.—Eagle Grove, Ia. (Waltham).

Washburn, Thomas G.—Treas. and Gen. Mgr. Aero & Marine Motor Co., 60 Pemberton Sq., Boston, Mass.

Washer.—A perforated disk which is slipped over the end of a bolt and serves as a bed for the nut which is screwed down upon it. Washers are usually of

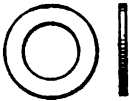


Fig. 1

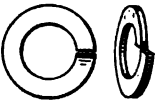


Fig. 2

iron, but rubber, leather, mica, etc., are also used for special purposes, say, in cocks and valves to make tight joints. Sometimes they have the form of a helical spring, in which case they are called "spring washers." Fig. 1 gives a plan and lateral view of a common washer, and Fig. 2 of a lock-washer.

Washer-cutter.—A machine for cutting out washers or gaskets.

Washer, Distance.—A piece of metal placed between loose or separated parts for the purpose of forming a tight joint. See Shim and Liner.

Washer, Lock.—See Washer.



Washer, Pump.—A cup-shaped leather washer (see figure), called also a "cup-leather," used as a packing for the piston of automobile pumps.

Washer, Spring.—See Washer.

Washington Auto Station.—5031 Cottage Grove Ave., Chicago, Ill. Garage.

Washington Automobile Co.—7th and Pacific Ave., Tacoma, Wash. (Ford, Jackson, Mitchell). W. W. Pickerell, Mgr.

Washington Automobile Co.—67-69 E. Maiden St., Washington, Pa. (Franklin).

Washington Automobile Dealers' Association.—817 14th St. N. W., Washington, D. C. B. C. Washington, Jr., Asst. Sec.

Washington Garage.—3918 Washington Blvd., St. Louis, Mo. (Pierce-Arrow, Peerless, Winton).

Washington Motor Car Co.—Washington, Ind. Mfrs. gasoline automobiles.

Washington Sq. Garage.—73 S. Washington Sq., New York City. Garage.

Waskey, Geo. H.—Partner Gulstine & Waskey, Madison, S. D.

Wasson Co.—Lincoln, Ill. (Pope-Waverley).

Waste-cock.—See Cock, Waste.

Waste, Cotton.—See Cotton-waste.

Waste-pipe.—The same as over-flow pipe.

Watch City Auto Garage.—Rear Park Theatre, Elm St., Waltham, Mass. Repairing.

Watch, Tachometric.—An instrument which indicates the average speed of travel of a motor-vehicle.

Water - column.—A small vertical column fitted with stop-cocks at different heights and connected with the generator of a steam-car, in order to permit the driver to gauge the height of water therein.

Water-cooling.—See Cylinder-cooling.

Water-feed.—A term applied to acetylene generators in which water is dripped on the carbide or otherwise fed to it.

Water-gauge.—A dial fixed to the dashboard to show the pressure of water in the circulation system due to the pump. (2) An upright glass tube connected at both ends with a steam boiler, so that the water-level in the tube is always the same as that in the boiler; same as water-glass, q. v.

Water in Gasolene.—See Gasolene.

Water-glass.—See Water-gauge (2).

Water-jacket.—See Jacket, Water.

Water-line.—A line on the plane of a vessel's flotation.

Water-meter.—The same as Water-gauge, q. v.

Water-pipes.—The pipes through which the water for cooling the cylinders of a motor circulates.

Water-skimmer.—See Hydroplane.

Water-tank.—See Tank, Water.

Water-tube Boiler.—See Boiler.

Water, Weight of.—One cubic foot of water weighs 1,000 ounces=62.4 pounds

=0.28 ton=6.24 gallons. 1 gallon=10 pounds. The pressure of 1 foot head of water=62.4 pounds per square foot=.4335 pound per square inch. The pressure of 1 atmosphere=14.7 pounds per square inch=33.9 feet of water=29.9 inches of mercury.

Waterbury Brass Co.—Waterbury, Conn. Mfrs. sheet and rod brass and copper, brazing compound, and brass and copper tubing.

Waterbury Mfg. Co. — Waterbury, Conn. Mfrs. lock nuts and washers, screws.

Waterbury Tool Co. — Waterbury, Conn. Mfrs. tools.

Waterloo Automobile Co.—Waterloo, N. Y. (Buick, Marmon).

Waterloo Woolen Mfg. Co.—Waterloo, N. Y. Mfrs. cloth and carpet trimmings.

Waterman Bros. Co., Inc.—1222 1st St., Fresno, Cal. (Cadillac, White).

Waterman, Cameron B.—Pres. Waterman Marine Motor Co., 1506 Fort St. W., Detroit, Mich.

Waterman Marine Motor Co.—1506-1512 Fort St. W., Detroit, Mich. Mfrs. marine and automobile motors. Cap. \$30,000. Est. 1906. Cameron B. Waterman, Pres.; Frank R. Thrall, Treas. and Gen. Mgr.; R. W. Fishback, Supt.; E. L. Anderson, Chief Engineer.

Watermann-Hunter Co.—515 1st Ave. S., N. E. Minneapolis, Minn. Mfrs. portable houses.

Waters, Elmer R.—South Raub, Ind. (Haynes).

Waterson & Sons, H.—67 Albert Rd., Aston, Birmingham, England. Mfrs. goggles and radiators.

Watertown Auto & Supply Co.—Watertown, N. Y. (Matheson).

Watertown Automobile Club.—Watertown, N. Y. I. G. De Cant, Pres.; C. A. White, Sec.

Watertown Motor Co.—40 Moulton St., Watertown, N. Y. Mfrs. gasoline marine motors and motorboats.

Waterville Motor Co.—245-249 Main St., Waterville, Me. (Reo, Lambert). Est. 1905. Garage, 25 cars. Repairing.

Watkins Co., The Frank M.—525-531 Baymiller St., Cincinnati, O. Mfrs. gasoline marine motors.

Watkins, J. M.—Mt. Carmel, Pa. (Maxwell).

Watres Mfg. Co.—1131 Broadway, New York City. Mfrs. exhaust horns.

Watrous Automobile Co.—Main St., Elmira, N. Y. Garage.

Watson, Alfred S.—Sec. and Treas. Witherbee Igniter Co., 541 W. 43rd St., New York City.

Watson Bros.—Foundry and Division Sts., S. Boston, Mass. Mfrs. mica.

Watson Bros.—Marinette, Wis. (Waltham).

Watson, Coleman.—290 Broad St., Lynn, Mass. (White).

Watson Co., H. F.—Erie, Pa. Mfrs. asbestos.

Watson, Isaac.—Madison, N. J. Garage.

Watson, J. C.—Scales Mound, Ill. (Waltham).

Watson, P. M.—Sec. and Treas. Indianapolis Drop Forging Co., Indianapolis, Ind.

Watt.—The unit of power employed in electro-technics. It is the energy furnished in 1 second by a current of 1 ampere flowing under a potential difference of 1 volt, that is, 1 joule. One horsepower (q. v.) equals 746 watts.

Watt-hour.—The unit of work in electro-technics and corresponding to 1 ampere-hour (q. v.) multiplied by 1 volt. The multiples of the watt-hour are the hektowatt-hour, equal to 100 watt-hours, and the kilowatt-hour equal to 1,000 watt-hours. While the watt measures the power, that is to say, the energy, furnished per second, the watt-hour measures the total energy supplied in a given time. See Watt, Kilowatt, Hektowatt-hour and Kilowatt-hour.

Watt-meter.—An apparatus for measuring directly the electric power of a current which is expressed in watts. A current of U volts and I amperes has a power, W, equal to U I watts. The apparatus consists of a coil of fine wire movable in the interior of a fixed coil of coarse wire, placed in front. The couple which tends to produce the rotation of the movable coil is proportional to the power of the current, that is to say, to U x I. It is measured by the torsion of the spring supporting the movable device, to which is fixed the indicating pointer. The watt-meter is used chiefly with alternating currents.

Watt Engine Co.—Port Huron, Mich. Mfrs. gasoline automobile motors.

Watters, John S.—233 Baronne St., New Orleans, La. (Wayne).

Watts De Golyer Co., The.—377 Illinois St., Chicago, Ill. Mfrs. enamel, varnishes.

Watts, Harry. — Logansport, Ind. (Lambert).

Wachusett Automobile Club of Fitchburg.—Gardner, Mass. L. H. Greenwood, Sec.

Waugh & Co., Chas.—856-864 Main St., Cambridge, Mass. Mfrs. automobile tops.

Waugh, T. Milton.—1525 Monadnock Blk., Chicago, Ill. Mfr. spring leaves.

Waukegan Motor Car Co.—119 S. Sheridan Rd., Waukegan, Ill. (Elmore).

Waukesha Motor Co.—110 North St., Waukesha, Wis. Mfrs. and dealers gasoline engines, timers, transmissions, clutches and garage connections. Mfrs.

gasolene automobiles. Est. 1906. A. T. Stebbins, Pres. and Sales Mgr.; Fred Ahrens, Supt. of Works and Vice-Pres.; H. L. Horning, Mechanical Engineer, Sec. and Treas.

Waukesha Sheet Steel Co.—Waukesha, Wis. Mfrs. sheet iron and steel.

Waverly Electric Auto Co.—Charleston, S. C. (Pope-Waverley).

Waverly Garage.—334 Waverly Ave., Brooklyn, N. Y. Garage.

Way Muffler Co., The.—23rd and Arch Sts., Philadelphia, Pa. Mfrs. mufflers, wearing apparel.

Wayman & Murphy.—Randolph and Sagamon St., Chicago, Ill. Mfrs. automobile tops.

Wayne Automobile Agency.—507 Mutual Life Bldg., Seattle, Wash. (Wayne).

Wayne Automobile Co.—Piquette and Brush Sts., Detroit, Mich. Makers of the Wayne Thirty; first automobile marketed in 1901. Nine models made since. Cap. \$300,000. B. F. Everitt, Pres. and Gen. Mgr.; Chas. L. Palms, Chairman of the Board, Sec. and Treas.; J. B. Book, Vice-Pres.; Wm. Kelly, Consulting Engineer; J. W. Grose, Purch. Agt.; Joseph D. Porter, General Sales Mgr.; Directors: B. F. Everitt, Charles L. Palms, J. B. Book, C. R. Wilson, Wm. Kelly. Agents and dealers: Aston, T. R., Bridgeport, Conn.; Bennett Auto Co., E. J., Los Angeles, Cal.; Bonney Motor Car Co., Kansas City, Mo.; Capitol Automobile Co., Indianapolis, Ind.; Central Automobile Exchange, Providence, R. I.; Commercial Auto & Supply Co., Washington, D. C.; Craig Garage Co., Toledo, O.; Cramer, J. A., Buffalo, N. Y.; Davis, C. H., Columbus, O.; Donato, Lanza & L., La Paz, Bolivia; Evans Motor Car Co.; Menneapolis, Minn.; Fich, H. Chr., Copenhagen, Denmark; Fraser & Reynolds, Philadelphia, Pa.; Freed & Bransford, Salt Lake City, Utah; Gloyd, S. M., Oklahoma City, Okla.; Elguera, Hermanos, Lima, Peru; Hobron, T. W., Honolulu, H. I.; International Automobile Co., Toronto, Can.; Johnston & Co., C. S., New Haven, Conn.; Johnstown Automobile Co., Johnstown, Pa.; Kane, M. Francis, Seattel, Wash.; Kull Auto Co., A. L., New York City; Lakedel Automobile Co., St. Louis, Mo.; Liberty Automobile Co., Pittsburg, Pa.; Linscott Motor Co., Boston, Mass.; Morfin, Carlos, Aguascalientes, Mex.; Motor Car Agencies Co., San Francisco, Cal.; Mullock's Garage, Atlantic City, N. J.; Newark Motor Car Co., Newark, N. J.; Neeley, N. A., Christ Church, New Zealand; Pales, D. W., Guayama, Porto Rico; Pawler, P., Calumet, Mich.; Solliday Motor Car Co., Milwaukee, Wis.; Smith, William, Jersey City, N. J.; Southern Automobile Co., Mobile, Ala.; Stringer, Bert A., Calgary, Alberta, Can.; Tredway, W. S., Nor-

wood, Cincinnati, O.; Troy Carriage Works, Troy, N. Y.; Warminster Motor Co., Ltd., Warminster, England; Wayne Motor Co., Chicago, Ill.; Wentworth, Frank, Dover, N. H.; Western Automobile Co., Denver, Colo.; West Side Motor Co., Hamilton, O.

Wayne Garage.—33 Grant Sq., Brooklyn, N. Y. (Wayne).

Wayne Motor Co.—1337 Michigan Ave., Chicago, Ill. (Wayne).

Wear, F. E.—Pres. Kansas City Motor Car Co., Sheffield, Mo.

Weatherford Electric Co.—Weatherford, Tex. (Holsman).

Weathers, J. F.—Columbus, Ga. Garage.

Weaver, C. H.—255 Elm St., Oil City, Pa. (Buick, Oldsmobile and Royal).

Weaver, H. C.—Portsmouth, N. H. (Maxwell).

Weaver, J. C.—720 S. Main St., Akron, O. (Queen).

Weaver, Jos. W.—621 Spring Alley, Lebanon, Pa. Garage.

Weaver, K. B.—Asst. Supt. Long Arm System Co., Lakeside Ave. and E. 38th St., Cleveland, Oo.

Weaver, R. H.—Mgr. W. C. P. Automobile Supply House, 1739 Broadway, New York City.

Web.—The thin plate of metal connecting the boss with the rim of a gear-wheel. When the web is cut through radially into alternate spaces and arms it forms a spoked-wheel. (2) The arm of a crank when flat and thin. (3) The narrow part of an anvil below the head. (4) The blade of a saw. (5) The central vertical part between the flanges of an I-beam.

Web-plate.—The metal which connects the eye-boss of a wheel with its rim.

Webb & Son, James A.—50-52 Stone St., New York City. Mfrs. denatured alcohol.

Webb & Son, W. H.—316 State St., Conneaut, O. (Rambler). Est. 1892. W. H. Webb, Prop.; C. W. Webb, Mgr. Garage, 8 cars. Repairing; supplies.

Webb Auto Co., A. C.—2nd and Joplin St., Joplin, Mo. Garage.

Webb, Clarence R.—San Angelo, Tex. (Cameron).

Webb, C. W.—Mgr. W. H. Webb & Son, 316 State St., Conneaut, O.

Webb, E. H.—Vice-Pres. Webb Mfg. Co., 60 Shipman St., Newark, N. J.

Webb, Frank Gardinier.—Governor L. I. A. C. B. Brooklyn, N. Y., Aug. 18, 1868. Ed. public, grammar schools. Director Home Title Insurance Co. of New York. Harwood Mfg. Co. Incorporator, ex-pres. and now governor L. I. A. C. Mem. clubs: A. C. A., N. Y. Motor. Suffolk County Gun, Society of Mayflower

Descendants, L. I. Historical Society, Tavern of Brooklyn. Res., 105 Garfield Pl.; office, 81 Willoughby St., Brooklyn, N. Y. Used first car (Winton) 1900. Mem. of executive com. of Vanderbilt Cup commissioners 1906-1907. One of the active organizers of the A. A. A. and mem. first board of governors.

Webb, H. B.—Treas. H. H. Franklin Mfg. Co., 302 S. Geddes St., Syracuse, N. Y.

Webb Mfg. Co.—60 Shipman St., Newark, N. J. Mfrs. speedometers, flexible shafts, wire belts. Cap. \$210,000. Est. Jan. 1, 1906. B. S. Whitehead, Pres.; E. H. Webb, Vice-Pres.; Walter C. Heath, Treas., and A. A. Bergner, Sec. Mem. M. & A. M.

Webb, W. H.—Prop. W. H. Webb & Son, 316 State St., Conneaut, O.

Webbing.—A strong hempen band used to connect the bows of vehicles and hold them in place. See Bow.

Weber.—The C. G. S. unit of the flux of magnetic force. It is the flux of force which traverses a square centimetre taken in an equipotential plane of a uniform field of an intensity equal to a C. G. S. unit or "gauss." (2) An old term for "ampere."

Weber Co., Orlando F.—1322 Michigan Ave., Chicago, Ill. (Pope-Toledo, Pope-Hartford, Pope-Waverley).

Weber Cycle & Supply Co.—Colorado Springs, Colo. Mfrs. turn tables.

Weber, Landolt.—Menziken, Argovia, Switzerland. Mfr. gasoline commercial automobiles.

Weber, W. H.—Detroit, Mich. (Rambler).

Webster, James.—Sec., Treas., Gen. Mgr., Sales and Adv. Mgr. Chicago Coach & Carriage Co., 1223-31 Michigan Ave., Chicago, Ill.

Webster Mfg. Co.—149 Jefferson Ave., Detroit, Mich., and Keany Sq. Bldg., Boston, Mass. Mfrs. gasoline tank gauges.

Webster Mfg. Co.—1075 W. 15th St., Chicago, Ill. Mfrs. axles.

Webster, W. H.—Sec. Motor Car Maintenance Co., 247-49 W. 49th St., New York City.

Weckerlein und Stöcker.—Werderstrasse 7, Nürnberg, Germany. Mfrs. make-and-break plugs.

Wedding, C. H.—Jerseyville, Ill. Garage.

Wedekind, Adolph.—Hamburg, Germany. Mfrs. storage batteries.

Weeber, Chas. L. F.—Vice-Pres. The Rauch & Lang Carriage Co., W. 25th St., Cleveland, O.

Weeber Mfg. Wks., C. F.—170-172 Central Ave., Albany, N. Y. Mfrs. mufflers and shock absorbers.

Weed Chain Tire Grip Co.—28 Moore

St., New York City. Mfrs. anti skid devices and tire chains.

Weed Garage.—233 Ontario St., Toledo, O. (Columbus).

Weed, W. S.—Ontario St., Chicago, Ill. Garage.

Weeks, C. M.—Babylon, N. Y. (Caddillac).

Wehrfreitz & Waldo.—150 Mulberry St., Newark, N. J. Garage.

Wehrle, R. L.—South Norwalk, Conn. Garage.

Wehrly, H. A.—New Paris, O. (Waltham).

Weichman, Veuve Franz.—Dresdenerstrasse 116, Vienna, Austria. Mfrs. acetylene lamps.

Weidig, J. F.—Supt. Winton Motor Carriage Co., Cleveland, O.

Weidely, G. A.—Treas. and Supt. Premier Motor Mfg. Co., Indianapolis, Ind.

Weidmann und Co.—93 Brunastrasse, Zürich, Switzerland. Mfrs. gasoline automobiles and automobile motors.

Weidner, Richard.—Liepzig, Germany. Mfrs. circulating pumps, carburetors and lubricators.

Weigel Motors, Ltd., 1907.—90 Goswell Rd., London, E. C., England. Mfrs. gasoline automobiles (Weigel).

Weight.—The action of gravity on a body. In the French system the unit of mass is a "gramme." A gramme-weight is the weight of a cubic centimetre of distilled water at 40°C. Thus the unit of mass is directly connected with the unit of length. There is no similar simple relation between the units of mass in the English system: a cubic inch of water weighs 252.5 grains. The English unit of mass is the standard pound avoirdupois. This contains 7,000 grains. There is also another pound in use called pound Troy, containing 5,760 grains. The ounce avoirdupois contains 437.5 grains, while the ounce Troy contains 480. The confusion which may arise from the use of two different pounds disappears if the weights are expressed in grains, for the grain is common to both systems.

Weight, Atomic.—The smallest weight of an element which enters into a molecule of any of its compounds. In the case of elements in the solid state, the atomic weight is related to the specific heat=6.4 (Dulong and Petit's law). The absolute weight of an atom of any element is unknown; so that the atomic weights have to be referred to some arbitrarily selected standard. Sometimes the atomic weight of hydrogen is put=1, and all others expressed in terms of it. It is now very common to take the atomic weight of oxygen=16, and express all other atomic weights in terms of that, in which case H=1.01.

Weight, Dead.—The weight of a vehicle without load (empty).

Weight, Heavy.—An automobile designed for public service, such as an omnibus, for transporting numbers of people, or a "truck" designed for commercial and industrial work.

Weight of Air.—One cubic foot of air at a pressure of 14.7 per square inch (i. e., 1 atmosphere) weighs, at 32°F., 0.08073 lb. or 1.29 ounce or 565.1 grains.

One litre of air at a pressure of 1 atmosphere (i. e., 1.0335 kilog. per square centimetre), at 0°C., weighs 1.293 gramme.

One atmosphere=14.7 lb. per square inch, or 2116.4 lb. per square foot, or 1.0335 kilog. per square centimetre.

Weight of Metals.—The following are the weights of one cubic inch of various metals: Steel, in pounds, 0.2833; in ounces, 4.533. Cast iron, in pounds, 0.263; in ounces, 4.208. Wrought iron, in pounds, 0.277; in ounces, 4.444. Copper, in pounds, 0.3225, in ounces, 5.159. Brass, in pounds, 0.308; in ounces, 5.333. Platinum, in pounds, 0.775; lead, in pounds, 0.377; cast aluminum, in pounds, 0.092; cast tin, in pounds, 0.32; cast zinc, in pounds, 0.262.

Weight of Water.—See Water, Weight of.

Weights, Metric.—

NAME	Grammes	Avoidr. Oz.	Avoidr. Lb.	Cwt.	Tons
Milligramme....	.001	.....	.....	.....	.....
Centigramme....	.01	.....	.....	.....	.....
Decigramme....	.1	.....	.....	.....	.....
Gramme.....	1	.035	.0022	.....	.....
Decagramme....	10	.35	.022	.....	.....
Hectogramme....	100	3.527	.22046	.0019	.....
Kilogramme....	1,000	35.2739	2.2046	.0196	.00098

Weiler, Ernst.—Blankenfelderstrasse 6, Berlin, Germany. Mfr. detachable rims.

Weill, H.—36 rue de Clery, Paris, France. Mfr. wearing apparel, fur hats, coats and coats.

Weingarten, Oscar.—Vice-Pres. Times Square Auto Co., 1599-1601 Broadway, New York City.

Weir Cycle & Gun Co.—106 W. 1st Ave., Monmouth, Ill. Garage.

Weisel, P. J.—Anaheim, Cal. (Moline, Ford, Maxwell).

Weiss & Son, Chas.—4725 Cottage Grove Ave., Chicago, Ill. Mfrs. curtain fasteners and automobile tops.

Weiss, Louis T.—286-90 Taaffe Pl., Brooklyn, N. Y. Mfrs. horns.

Welch, Andrew.—Aurora, Ill. (Cadillac).

Welch, A. R.—Gen. Mgr., Sales and Adv. Mgr. Welch Motor Car Co., Pontiac, Mich.

Welch Bros. Motor Car Co.—Grand Ave., cor. 7th St., Milwaukee, Wis. (Locomobile, Packard, Pope - Hartford, Woods). Garage, repairing, supplies.

Welch, F. S.—Sec. and Supt. Welch Motor Car Co., Pontiac, Mich.

Welch, G. R.—Sec. Holley Bros. Co., 661-75 Beaubien St., Detroit, Mich.

Welch Motor Car Co.—1871-1873 Broadway, New York City. (Welch). Est. 1905. Cap. \$100,000. L. H. Perlman, Pres.; J. H. Duffy, Vice-Pres.; John E. Brodsky, Sec. and Treas., and P. W. Strong, Mgr. Repairing.

Welch Motor Car Co.—Pontiac, Mich. Makers of the Welch car; first marketed in 1901. Seven models made since. Arthur Park, Pres.; W. L. Churchill, Vice-Pres.; F. S. Welch, Sec. and Supt.; A. R. Welch, Gen. Mgr., Sales and Advt. Mgr.; F. S. Milward, Purch. Agt. Agents and dealers: Auto-Motor Car Co., 804 Sycamore St., Cincinnati, O.; Bergdoll Motor Car Co., 323 N. Broad St., Philadelphia, Pa.; Ettwine Motor Car Co., 5701 Main St., Kansas City, Mo.; Keystone Automobile Co., 5905 Centre Ave., Pittsburg, Pa.; Mills-Kenedy Co., 733 Boylston St., Boston, Mass.; Morrison Auto Co., 3916 Washington Ave., St. Louis, Mo.; Neumann & Co., Wm. F. V., 1342 Woodward Ave., Detroit, Mich.; Power Vehicle Service Co., North and Madison Aves., Baltimore, Md.; Salliday Motor Car Co., 321 4th St., Milwaukee, Wis.; Welch Motor Car Co. of New York, Broadway and 62nd St., New York City.

Weld County Automobile Club.—Greeley, Colo. Frank I. Ewing, Sec.

Weld, Scarf.—The welding of two pieces of iron of which the edges have been flattened or chamfered.

Welding.—The process of forming a homogeneous joint between two pieces of iron or mild steel by heating them to a high temperature termed "welding heat," and pressing and hammering them together. "Welding heat" is a temperature of from 2500° to 2700° F. in the case of wrought iron; steel welds at a lower temperature.

Welding, Electric.—A process of welding metals by heating the parts by electric means. It is employed for pipes, rods, wires, sheet metal, etc. There are two methods, viz.: the "Incandescent" or Thomson system, and the "Arc" system. In the first, a very large current with a low voltage (usually 1 volt or 2 volts) is passed across the junction from one piece of metal to the other, and intense heat is produced in the vicinity of the joint, owing to the increase in the resistance of the hot metal. The two pieces of metal, on being pressed together, become welded into a homogeneous mass. In the arc system, a continuous current of much smaller amount, but with a voltage of 70 to 150 volts is used. The positive terminal is attached to the metal and the negative to a carbon rod fixed in a handle held by the operator. A powerful arc is formed between the

metal and carbon, and is caused to travel along the joint.

Welding Heat.—See Welding.

Welfringer et Cie., L.—9 cité de Phalsbourg, Paris, France. Mfrs. horns and sirens.

Wellendorf, B. E.—Vice-Pres. Stackpole Battery Co., St. Mary's, Pa.

Welles, Richard H.—Gen. Mgr. and Treas. The Badger Brass Mfg. Co. B. Saxton, Mo., Nov. 13, 1872. Ed. University School, Kenosha. Director Badger Brass Mfg. Co. of Kenosha and New York. Mem. Chicago Athletic Ass'n., Chicago A. C. Res., 180 Deming St., address, Kenosha, Wis. In the trade since 1899. Used first car (Locomobile) first year made. Original introducer and manufacturer of acetylene cycle lamps in the U. S. A.

Wellington Garage.—826 7th Ave., New York City. 2nd-hand cars.

Wellman, J. A.—Manchester, N. H. (Rauch and Lang).

Wells, A. H.—Pres. and Treas. A. H. Wells & Co., Watertown Rd., Waterbury, Conn.

Wells & Co., A. H.—Watertown Rd., Waterbury, Conn. Mfrs. seamless drawn tubing in brass, copper, bronze and silver. Cap. \$50,000. Est. 1887. A. H. Wells, Pres. and Treas.; S. J. Wells, Vice-Pres.; C. H. Wells, Sec. and Asst. Treas.

Wells Auto Co., G. A.—Tucson, Ariz. Garage.

Wells, Chas.—Gen. Sales Mgr. Glidden Varnish Co., Rockefeller Bldg., Cleveland, O.

Wells, C. H.—Sec. and Asst. Treas. A. H. Wells & Co., Watertown Rd., Waterbury, Conn.

Wells, F. J.—Engineer James McNaughton Co., 29 W. 42nd St., New York City.

Wells, Geo. W.—1013 14th St. N. W., Washington, D. C. (National).

Wells Light Mfg. Co., The.—44-46 Washington St., New York City. Mfrs. Wallworks patent, non-skidding tire covers. Roughsedge Wallwork, Prop. at Manchester, England; Geo. H. E. Rolinsen, Mgr. at New York.

Wells, Wm.—Machine Shop Dept. Cincinnati Auto Co., 215-219 E. 5th St., Cincinnati, O.

Wells, Prince.—814 4th Ave., Louisville, Ky. (Rambler).

Wells, S. J.—Vice-Pres. A. H. Wells & Co., Watertown Rd., Waterbury, Conn.

Weish, J. E.—Asst. Sec. Carter Motor Car Corp., 409-410 Munsey Bldg., Washington, D. C.

Welt.—The strip of iron laid over a butt-joint.

Wenne, E. H.—West Park St., Portland, Ore. Garage.

Wentworth Auto Station.—Central

Ave., Dover, N. H. (Reo, Premier, Wayne). Est. 1897. Garage, 35 to 40 cars. Repairing.

Wentworth Garage.—6346 Wentworth Ave., Chicago, Ill. (Cartercar).

Wentworth Motor Car Co.—11406-8 Euclid Ave., Cleveland, O. (Mora).

Wenzel, Gustav.—Niedersedlitz, Dresden, Germany. Mfrs. marine motors.

Werant & Rembe.—Havestraw, N. Y. (Ford).

Werner Car Importing Co.—110 W. 34th St., New York City. Mfrs. shock absorbers.

Werner, Geo. J.—Rye, N. Y. (Maxwell).

Werner, W.—401 Northampton Rd., Easton, Pa. Garage.

Werntz, O. S.—Treas. The National Acme Mfg. Co., cor. Stanton Ave. S. E. and E. 75th St., Cleveland, O.

Wert Motor Car Co.—Van Wert, O. (Ford, Rambler, Maxwell).

Werth, M. F. Maury.—Head of Marine Dept. Witherbee Igniter Co., 541 W. 43rd St., New York City.

Wertz, Charles.—113 S. Front St., St. Mary's, O. Garage.

Wertzig & Vermette.—Concordia, Kan. (Waltham).

Wesco Supply Co.—7th St. and Clark Ave., St. Louis, Mo. Mfrs. dry batteries.

Wesley, G. W.—Supt. General Vehicle Co., Broadway and 62nd St., New York City.

West Barnstable Motor Co.—West Barnstable, Mass. (Logan, Commercial).

West Box Co., F. M.—225 Liberty St., Springfield, Mass. Mfrs. battery, spark coil and tool boxes.

West Chester Garage.—118 W. Main St., West Chester, Pa. (Autocar, Winton).

West Coast Auto Co.—1008 Florida Ave., Tampa, Fla. (Maxwell).

West Coast Motor Car Co.—387 Golden Gate Ave., San Francisco, Cal. (Darracq).

West End Auto & Machine Co.—72 W. Main St., Stamford, Conn. (Maxwell).

West End Auto Garage Co.—1435 Washington St., West Newton, Mass. Garage.

West End Automobile Palace.—212 W. 89th St., New York City. Rental service, garage.

West End Garage.—266 W. 135th St., New York City. Repairing, garage, rental service.

West End Garage.—Long Branch, N. J. Garage.

West Garage.—Cor. Milton Ave. and Front St., Ballston Spa, N. Y. Est. 1907. Cap. \$50,000. T. W. Nichols, Mgr.; Walter Moyer, head of machine shop; Albert Parker, head of office. Garage, 75 cars. Repairing.

West, Geo., Jr.—Ballston Spa, N. Y. (Simplex).

West, Ltd.—85 Shaftsbury Ave., London, W. England. Mfrs. West-Astor gasoline automobiles.

West, W. E.—833 W. Myrtle St., San Antonio, Tex. Garage.

West Side Motor Co.—Hamilton, O. (Wayne).

West-Stillman Motor Car Co.—153 N. Broad St., Philadelphia, Pa. (Pennsylvania, Mercedes).

Westchester Motor Car Co.—124-26 Main St., near Franklin Ave., New Rochelle, N. Y. Supplies, garage, repairing.

Westchester Motor Club.—Tarrytown, N. Y. A. B. Barkman, Sec.

Westcott, W. A.—Purch. Agt. C. H. Blomstrom Motor Co. and De Luxe Motor Car Co., Clark St. and Jefferson Ave., Detroit, Mich.

Westerdale, H. E.—Adv. Dept. The Automobile. Flatiron Bldg., New York City.

Westerfield Motor Co., The.—1525 S. Main St., Anderson, Ind. Mfrs. transmission gears, gasoline automobile motors and mufflers.

Westergard, Wm. J.—Valley City, N. Dak. Garage.

Westerly Garage, The.—88 Main St., Westerly, R. I. Supplies, garage and repairing.

Western Auto Co.—Denver, Colo. (Wayne).

Western Auto Co.—4701 Washington Blvd., St. Louis, Mo. (Pierce-Arrow, Winton).

Western Auto Parts Co.—107 Dearborn St., Chicago, Ill. Mfrs. gasoline automobiles.

Western Auto Supply Co.—414-416 3rd Ave., Cedar Rapids, Ia. (Mitchell, Reo and Glide).

Western Auto Supply Co.—285 Virginia St., Milwaukee, Wis. Mfrs. gasoline marine motor.

Western Automatic Machine Screw Co., The.—Elyria, O. Mfrs. bolts, nuts, screws, steps.

Western Automobile & Supply Co.—115 N. Cascade. Colorado Springs, Colo. (Peerless, Oldsmobile, Columbus, Franklin).

Western Automobile & Supply Co.—211 S. Main St., Wichita, Kan. Repairing.

Western Automobile Co.—Calgary, Alberta, Can. (Logan).

Western Automobile Co.—384 Cedar St., St. Paul, Minn. (Winton, Woods, Pope-Toledo, Franklin).

Western Brass Mfg. Co.—21st and Rockwell Sts., Chicago, Ill. Mfrs. brass, bronze, aluminum and copper castings.

Western Drop Forge Co.—Marion, Ind. Mfrs. drop forgings, boiler-steel shells, tanks, and storage tanks.

Western Electric Co.—259 S. Clinton St., Chicago, Ill. Mfrs. ammeters and voltmeters, primary batteries, spark coils, electric switches.

Western Engine Works, The.—Austin, Chicago, Ill. Mfrs. gasoline automobiles.

Western Garage.—218 S. 40th St., Philadelphia, Pa. Garage.

Western Instrument Co.—18-20 W. Randolph St., Chicago, Ill. Mfrs. screw machine products and stampings.

Western Launch & Engine Works.—Michigan City, Ind. Mfrs. gasoline marine motors.

Western Malleable Steel Co.—1250 River St., Detroit, Mich. Mfrs. gray iron castings, steel castings, drop forgings.

Western Motor Car Co.—1004-6 K St., Sacramento, Cal. (Jewel, Reo, Stoddard-Dayton, and Maxwell).

Western Motor Car Co.—1412-14 Michigan Ave., Chicago, Ill. (Stearns).

Western Motor Car Co.—Sturgis, Mich. (Knox).

Western Motor Car Co.—Lincoln, Cal. (Maxwell, Rambler).

Western Motor Car Co.—Los Angeles, Cal. (Packard, Thomas, Stevens-Duryea, Buick). Est. 1904. Cap. \$100,000. Chas. E. Anthony, Pres.; Earle C. Anthony, Vice-Pres. and Mgr.; H. K. Anthony, Sec. and Treas. Garage, 50 cars. Repairing.

Western Motor Co.—Logansport, Ind. Mfrs. Rutenber gasoline motors and gray iron castings. Est. 1900. Cap. \$250,000. Robert Parker, Pres.; E. H. Wolcott, Vice-Pres.; F. B. Wilkinson, Sec. and Treas. Repairing.

Western Motor Co.—Logansport, Ind. Garage.

Western Oil Pump Co.—2447 Kosciusko St., St. Louis, Mo. Mfrs. oil pumps, tanks, storage tanks.

Western Realty & Loan Co.—Glen Ulen, N. Dak. (Buick).

Western Reserve Varnish Co.—Marquette St., Cleveland, O. Mfrs. varnishes.

Western Rubber Co.—Goshen, Ind. Mfrs. rubber cloth.

Western Storage Battery Co.—Indianapolis, Ind. Mfrs. storage batteries.

Western Tool Works.—Galesburg, Ill. Makers of the Gale gasoline automobiles and commercial vehicles.

Western Tube Co.—Kewanee, Ill. Mfrs. pipe and brass fittings, wrought iron and steel pipe, safety valves.

Westfaelische Automobile Gesellschaft.—Soest-im-Westphalia, Germany. Mfrs. gasoline automobiles.

Westfaelische Metallindustrie Actiengesellschaft.—Lippstadt, Germany. Mfrs. acetylene lamps, horns.

Westfield Auto Station.—95 Elm St., Westfield, Mass. Garage.

Westing Co., G. H.—219 Massachusetts Ave., Indianapolis, Ind. (Indian).

Westinghouse Air Brake Co.—Pittsburg, Pa. Mfrs. air compressors.

Westinghouse Electric & Mfg. Co.—Pittsburg, Pa. Mfrs. ammeters and voltmeters, charging apparatus, electric controllers, electric generators, electric motors. Selling Agts. The American Distributing Co., Cleveland, O.

Westinghouse Electric Co., Ltd.—4 rue Aubert, Paris, France. Mfrs. chains.

Westinghouse, Société Anonyme.—2 bvd. Sadi-Carnot, Havre, France. Mfrs. gasoline and gasoline commercial automobiles (Westinghouse).

Westlake Garage Co., Inc.—660 S. Alvarado St., Los Angeles, Cal. Garage.

Weston, Edward.—Pres. Weston Electrical Instrument Co., Waverly Park, Newark, N. J.

Weston, Edward F.—2nd Vice-Pres. Western Electrical Instrument Co., Waverly Park, Newark, N. J.

Weston Electrical Instrument Co.—Waverly Park, Newark, N. J. Mfrs. electrical measuring instruments. Cap. \$500,000. Est. March, 1888. Edward Weston, Pres.; John R. Hardin, 1st Vice-Pres.; Edward F. Weston, 2nd Vice-Pres.; Frederick Bristow, Treas., and Caxton Brown, Sec. Mem. M. & A. M.

Weston, H.—Jacksonville, Fla. Prop. Duval Garage.

Weston-Mott Co.—Flint, Mich. Mfrs. axles, channels, hubs, steel rims and wood wheels.

Westrumite.—A tar preparation designed to lay the dust on roads (see Tarring). It is produced by emulsifying or semi-saponifying wood-tar, pure or otherwise, with coal tar by means of alkaline liquids such as the ammoniacal or gas liquor.

Westwood, E. C.—Sec. Austin Automobile Club, Austin, Tex.

Westwood Tyre & Rim Co., Ltd.—89 Station St., Birmingham, England. Mfrs. metallic rims.

Wet Battery.—See Battery, Wet.

Wet Steam.—See Steam, Wet.

Wetherill Finished Castings Co.—Office, 12th and Cumberland Sts.; factory, Richmond St. and Erie Ave., Philadelphia, Pa. Mfrs. castings, aluminum and brass.

Wetmore, H. A.—Athon, Ia. (Waltham).

Wetmore, John Chetwood.—Automobile editor and adv. mgr. N. Y. Evening Mail; correspondent Motor Age. B. Elizabeth, N. J., Aug. 22, 1856. Ed. Columbia grammar school 1875, Columbia University 1879, Columbia Law School 1881. Mem. Sons of American Revolution, N. Y. Yacht Club. Res. Elizabeth, N. J.; office 29 W. 42nd St. New York City. Recreation, motor boating.

Wetzel, Thos. Johnson.—Manufacturers' selling agent. B. Dayton, O., June 2, 1867. Ed. public school Mem. Cleveland A. C., Buffalo A. C., N. Y. Athletic. Res. Richfield Springs, N. Y.; office 29 W. 42nd St., New York City. In the trade since 1901. Used first car (Oldsmobile) 1903.

Wever, H. E.—Portsmouth, N. H. (Maxwell).

Weygant Son's, R. F.—Central Valley, N. Y. (Maxwell).

Weygant, W. M.—Tuxedo Park, N. Y. (Maxwell, Mitchell).

Weyher et Richmond Société Anonyme des Établissements.—52 route d'Auber-villiers, Pantin, France. Mfrs. steam automobiles. (Weyher-Richmond cars).

Wheel & Wood Bending Co., The.—141 John St., Bridgeport, Conn. Mfrs. top bows, wood wheels, wood bendings.

Wheel, Artillery.—Wooden wheels of the "artillery" type are now almost universally used for automobiles. This type of wheel is constructed with wedge spokes (Fig. 1) set together around the nave, and a hub of steel plates, front and rear bolted through the spokes and holding the axle-box in place. As may be seen from Fig. 2, which represents a complete wheel, this wheel has a long bearing surface on the axle, which increases its wearing power, and gives it greater stability. It has been adopted in motor-car construction because of its great strength in comparison with its weight. Motor-vehicle wheels are much smaller than those of horse-drawn vehicles, varying from 26 inches in small runabouts to 36 inches in large cars. One reason for this, aside from their greater strength, is that the motor runs more rapidly than the wheels, which necessitates gearing, and large wheels require a greater difference in gear-ratios than do small ones. The wheels of motor-cars are often slightly "dipped" (see Dip) in order to prevent their tendency to fly out when running at a high speed under load.

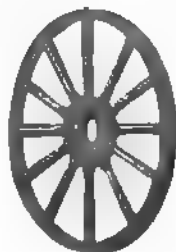


Fig. 1.



Fig. 2.

Wheel-base.—See Base, Wheel.

Wheel, Bevel.—Gear, Bevel.

Wheel-boss.—The enlarged part of a shaft on which a gear-wheel is keyed. See Boss.

Wheel, Chain.—The same as sprocket. q. v.

Wheel, Cog.—See Cog-wheel.
Wheel, Compression.—See Wheel, Road.

Wheel, Crown.—A toothed wheel with the teeth at right angles to its plane. Used in certain cases instead of a bevel wheel for connecting two shafts at right angles.

Wheel, Dipped.—See Dip.

Wheel, Dished.—See Dish.

Wheel, Disk.—A wheel consisting of two steel plates, each dished, and the two fastened together at their edges. The disk wheel possesses great strength, greater, in fact, for a given weight, than either a wooden spoked or wire wheel; and, in addition, is easily cleaned and nearly impossible to damage. This type of wheel, however, is but little used at present, notwithstanding its numerous advantages.

Wheel, Driving.—One of the wheels of the rear axle of a motor-vehicle to which is transmitted the action of the motor.

Wheel, Fifth.—See Fifth Wheel.

Wheel, Fly.—See Fly-wheel.

Wheel, Gear.—See Gearing.

Wheel, Half-time.—A toothed wheel keyed on the cam-shaft of a 4-cycle motor, and so called because to it is communicated a velocity whose ratio to that of the crank-shaft is as 1 to 2.

Wheel, Hand.—Any wheel rotated by hand to actuate a piece of mechanism.

Wheel, Idle.—See Idle-wheel.

Wheel Lock.—See Lock.

Wheel, Milling.—A small wheel of strongly tempered steel, with corrugations on its periphery, and by means of which corresponding corrugations can be rapidly made on objects of softer metals, such as copper, bronze nuts, caps, screw-heads, etc.

Wheel, Plate.—A wheel of which the boss is connected to the rim by a web (see Web).

Wheel, Ratchet.—See Ratchet-wheel.

Wheel, Sprocket.—See Sprocket.

Wheel, Spur.—See Gear, Spur.

Wheel, Steering.—Properly, one of the wheels of the front axle of a motor vehicle, but by common usage, the hand-wheel at the top of the post that conveys motion to the steering-gear. See Steering-wheel.

Wheel, Suspension.—See Wheel, Road.

Wheel-teeth, Shaping.—See Pitch-circle.

Wheel, Tubular, Steel.—A wheel which has been used to a certain extent on motor-cars, and which has the advantage of possessing considerable strength, especially in a lateral direction, and of being greatly superior to the wire wheel. It is imperfectly elastic, however, and has very little of the spring effect desirable.

Some of the advantages claimed for steel tubular wheels are true, balanced running; ability to withstand the torsion and tension of severe strains in the transmission of power, and perfect alignment of all parts.

Wheel, Wire.—See Wheels, Road.

Wheelan, J. D.—Care of Dallas Auto Co., Dallas, Tex. (Thomas.)

Wheeler & Schebler.—Shelby and Sanders Sts., Indianapolis, Ind. Mfrs. carburettors. Est. 1904. Mem. M. & A. M.

Wheeler, B.—Stanfordville, N. Y. Garage.

Wheeler, O. D.—19 Maple St., Marlboro, Mass. (Moline, Pope-Hartford).

Wheeler, C. F.—Vilas, Colo. (Walsham).

Wheeler, Schuyler Skaats.—Electrical engineer. B. N. Y. City, May 17, 1860. Ed. Friends Sem., Keble Hall, Columbia grammar sch., Columbia Univ.; grad. Hobart Coll., Dr. S. Pres. Crocker-Wheeler Co. Mem. Am. Soc. of Mech. Eng's.; Am. Soc. of Civil Eng's.; Inst. of Electrical Eng's. (pres.); St. Nicholas Soc. (chm'n. Bldg. Com.). Clubs: A. C. A., University, Lawyers, Lotus, Engineers. Address: Ampere, N. J. Was chairman of Building Com. of A. C. A. during erection of new club house, under direction of which the new dynamometer and testing plant was installed.

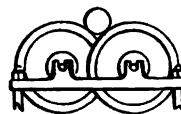
Wheeler, W. L.—Menasha, Wis. (Buick, Winton).

Wheeling Automobile Co.—"The Auto Inn," 16th and Eoff Sts., Wheeling, W. Va. (Winton, Cadillac, Frayer-Miller, Reo, Rapid.)

Wheels, Auto, Speed Revolutions of.—The following table gives the number of revolutions per minute of automobile road-wheels at different rates of speed:

Diam. of Wheel	MILES PER HOUR									
	2	4	6	8	10	15	20	25	30	40
24 in.	28	56	84	112	140	210	280	350	420	560
26 "	26	52	78	103	129	194	258	323	388	517
28 "	24	48	72	96	120	180	240	300	360	480
30 "	22	45	67	90	112	168	224	280	336	448
33 "	20	41	61	82	102	153	204	255	306	408
36 "	19	37	56	75	93	140	187	234	280	374
42 "	16	32	48	64	80	120	160	200	240	320

Wheels, Friction.—An arrangement in which the extremity of an axle (see figure), instead of



resting in a cylindrical socket, is made to rest on the circumferences of two wheels, to the axles of which the friction is transferred, and consequently diminished in the ratio of the radius of each friction-wheel to the radius of its axle. (2) The wheels or disks in a friction transmission, q. v.

Wheels, Road.—Motor-car road-wheels may be divided into two types,

"suspension" and "compression." The first are formed of hard-drawn steel wire spokes, which are held into the hub by means of a shoulder and drawn tight into the rim by a nipple. In this type of wheel the spokes require to be "staggered" in order to give the wheel lateral stability. A suspended wire wheel can carry considerable weight in proportion to its own weight, but is unable to sustain as great a lateral stress, or stress at right angles to its plane, as a wooden wheel. Some years ago wire wheels were extensively applied to motor-cars of all powers, but are scarcely used now except with the buggy type of vehicle (see figure). At present wooden compression wheels of the artillery type are the kind almost universally employed on automobiles. See Wheel, Artillery.

Wheel, Wire.—See Wheels, Road.

Wheelwright, Geo. F.—488 Broad St., Providence, R. I. (Lambert).

Wheezing.—A sound in the cylinder due to the escape of gas or air under pressure, often caused by loose or worn piston-rings or scoring of the bore of the cylinder.

Whipple, Harlan Woodbury.—Retired.



B. South Dartmouth, Mass., Oct. 8, 1865. Ed. Phillips Andover, '85; Williams College, '88. Mem. clubs: A. C. A., Mass. A. C., R. I. A. C., Bay State Auto Ass'n., Worcester A. C., Vesper Country. Boston. Res. Westbury Court, Andover,

Mass. Used first car February, 1900. Is now driving 23rd car. 60 hp. Matheson.

Whipple, R. W.—169 State St., Binghamton, N. Y. Mfrs. brakes, jacks, automobile seats, and dos-a-dos seats.

Whipple, "The Motorcycle Man."—260 W. Jackson Blvd., Chicago, Ill. (Indian and Merkel).



Whistle.—A signaling device which emits a loud sound when steam or air is blown through it. The United States Government regulations demand the use of a suitable signal on all launches propelled by machinery of any description.

Witcher & Co., Frank W.—14 Albany

St., Boston, Mass. Mfrs. leather and artificial leather.

Whitcomb Auto Co.—Merrick Rd. and Broadway, Lynbrook, Long Island, N. Y. (Maxwell).

Whitcomb Auto Co., T. C.—E. 9th St., Cleveland, O. (Rambler).

Whitcomb, Lawrence.—Sec. Treas. and Gen. Mgr. National Brake and Clutch Co., 16 State St., Boston Mass.

Whitcomb, M. L.—Pres. Haverhill Fire Appliance Co. Office, 40 Merrimack St.; factory, Island Park, Haverhill, Mass.

Whitcomb, Wm, W.—Pres. National Brake and Clutch Co., 16 State St., Boston, Mass.

White & Bagley Co., The.—100 Foster St., Worcester, Mass. Mfrs. oils, automobile body soap, hand soap.

White & Grasswick.—Calgary, Alberta, Can. (Marmon, Russell, Rambler).

Whits & Poppe, Ltd.—Coventry, England. Mfrs. automobile motors, carbureters and motorcycle motors.

White, A. Corydon, Jr.—640 Main St., Springfield, Mass. (White, Stanley).

White, A. E. F.—Treas. Acme White Lead & Color Works, Detroit, Mich.

White Agency.—176 State St., Binghamton, N. Y. (White.) Est. 1905. John A. Gale, Pres.; C. E. Collier, Sec. and Treas.

White Auto Co.—11 Dorrance St., Providence, R. I. (White).

White Auto Repair Co.—164 W. 46th St., New York City. Repairing.

White Auto Station.—26 Sabin St., Providence, R. I. Garage.

White Automobile Agency.—1116 Main St., Buffalo, N. Y. (White). Supplies and garage.

White Automobile Co.—976 N. High St., Columbus, O. (Aerocar, White, Baker).

White Blakeslee Mfg. Co.—Birmingham, Ala. Garage.

White, Chas.—Monett, Mo. (Jewel).

White, Chas. E.—Pres. Standard Automobile Wks., 110 5th Ave., Clinton, Ia.

White Co., The.—Rose Bldg., Cleveland, O. Makers of White steam cars; first marketed in 1901. Eight different models made since. Windsor T. White, Pres.; Rollin H. White, 1st Vice-Pres.; Walter C. White, 2nd Vice-Pres.; A. R. Warner, Sec.; Bert Graves, Supt.; E. L. Hewitt, Purch. Agt.; R. H. Johnston, Adv. Mgr. Branches: Boston, 320 Newbury St., J. S. Hathaway, Mgr.; Chicago, 240 Michigan Ave., W. J. Urquhart, Mgr.; Cleveland, O., 407 Rockwell Ave., J. L. Cross, Mgr.; London, 35 King St., Regent St., Frederick Coleman, Mgr.; New York City, Broadway and 62nd St., G. W. Bennett, Mgr.;

Philadelphia, 629 N. Broad St., G. H. Smith, Mgr.; San Francisco, 1760 Market St., C. A. Hawkins, Mgr.

White Co., The.—35 King St., Regent St., London, England. (White). Frederick. Coleman, Mgr.

White Co., The.—407 Rockwell Ave., Cleveland, O. (White.) J. L. Cross, Mgr. Garage.

White Co., The.—240 Michigan Ave., Chicago, Ill. (White). W. J. Urquhart, Mgr.

White Co., The.—1760 Market St., San Francisco, Cal. (White). C. A. Hawkins, Mgr.

White Co., The.—629 N. Broad St., Philadelphia, Pa. (White). G. H. Smith, Mgr.

White Co., The.—320 Newbury St., Boston, Mass. (White). J. S. Hathaway, Mgr.

White Co., The.—Broadway and 62nd St., New York City. (White). G. W. Bennett, Mgr.

White Co., The.—1380 Bedford Ave., Brooklyn, N. Y. (White).

White Co., The.—19 E. 9th St., Bellefontaine, O. (White).

White Co., The.—484 Main St., East Orange, N. J. (White.) Cap. \$25,000. B. F. Adams, Mgr.

White Co., The.—417 Federal St., Troy, N. Y. (White.)

White Co.—Detroit, Mich. Garage.

White Co.—19 E. 9th St., Cincinnati, O. (White).

White Co., H. C.—North Bennington, Vt. Garage.

White Copper.—See German Silver.

White Dental Mfg. Co.—Philadelphia, Pa. Mfrs. flexible shafting.

White, Frank.—Portland, Ind. (Pope-Hartford.)

White, Fred R.—Vice-Pres. and Gen. Mgr. The Baker Motor Vehicle Co. Vice-Pres. American Ball Bearing Co. B. Cleveland, O., Feb. 17, 1872. Ed. Cornell. Director Baker Motor Vehicle Co. Mem. clubs: Union, University, Roadside, Cleveland A. C. Res., 6619 Euclid Ave., Cleveland, O. Office, Baker Motor Vehicle Co., Ft. 80th St. N. W., Cleveland, O. In the trade since 1899. Used first car 1897.

White, Frederick W.—Treas. Pilot Garage & Supply Co., Worcester, Mass.

White Garage.—Coronado, Cal. Garage.

White Garage.—712 S. Broadway, Los Angeles, Cal. (White, Pope-Hartford, Pope-Toledo.)

White Garage.—1010 Morton, Baltimore, Md. Garage. (White.) H. M. Rowe, Mgr.

White Garage.—Lynn, Mass. (White.)

White Garage.—666 State St., New Haven, Conn. (White.)

White Garage.—Petersboro, N. H. Garage.

White Garage.—1215 Madison Ave., Toledo, O. (White.)

White Garage Co.—240 Michigan Ave., Chicago, Ill. (White.)

White, Geo. W.—Treas. Pope Automobile Co. of Washington, 817-19 14th St. N. W., Washington, D. C.

White, H. A.—Memphis, Tenn. (Cadillac.)

White, H. C.—Sec. The Insulated Wire and Cable Co., 114 Liberty St., New York City. Factory. Bayonne, N. Y.

White Heat.—The temperature at which a body emits a white light. The "white heat" of the smith's forge is the temperature to which a large piece of iron is heated before removal from the fire. say between 2370 and 2730 F.

White, H. Kirke.—Vice-Pres. Acme White Lead & Color Works, Detroit, Mich.

White, Hugh.—Sec. and Treas. Utica Drop Forge & Tool Co., 75 Genesee St., Utica, N. Y.

White, J. Bartlett.—Waltham, Mass. Garage.

White, John.—Direc. Pittsfield Spark Coil Co., Dalton, Mass.

White, J. L.—419 Auburn St., Buffalo, N. Y. Garage.

White, J. W.—543 Broad St., Augusta, Me. Garage.

White Lead.—See Lead, White.

White Metal.—Another name for Babbitt's metal, q. v.

White Mfg. Co.—72 S. Canal St., Chicago, Ill. Mfrs. braziers.

White Mfg. Co.—Cannon St., Bridgeport, Conn. Mfrs. lamps and metal trimmings.

White, M. T.—74 Bridge St., Springfield, Mass. (Maxwell.)

White Plains Garage.—2-4 Mamaronck Ave., White Plains, N. Y. Supplies; garage.

White, P. M.—Pres. Unique Metal Co., 25 Illinois St., Buffalo, N. Y.

White, R. C.—Pres. Baker Motor Vehicle Co., 80th St. N. W., Cleveland, O.

White, Rolin Henry.—Vice-Pres. The White Co. B. Cleveland, O., July 11, 1872. Ed. Cornell University. Director The White Co.

White, Sam B.—91 Sabin St., Providence, R. I. Mfr. valve lifters.

White-Savage Auto Co.—43 S. State St., Salt Lake City, Utah. (Stearns, Matheson, Cadillac.)

White Steam Cars.—21 E. 9th St., Cincinnati, O. (White.)

White, T. L.—Manchester, Mass. Mfrs. motor-boats.

White, Walter C.—A racing and touring driver of prominence, Second Vice Pres. The White Company, makers of White steam cars. He competed in the Elimination trials, held to select a team to represent America in the 1905 Vanderbilt Cup race, and in many races on the track, hill-climbs, etc.

White, Windsor Thomas.—Pres. The White Co. B. Orange, Mass., Aug. 28, 1866. Ed. Worcester Polytechnic Institute, degree B. S.

Director The White Co., White Sewing Machine Co., First National Bank of Cleveland, Park Drop Forge Co. Mem. clubs: Union, Tavern, Hermit, Country of Cleveland, Engineers', Green Spring Valley Hunt Res., Bratenahl, Cleveland, O. Office, St Clair Ave. and 79th St. Cleveland O. In the trade since 1900

White, W. McKean.—Automobile editor Philadelphia Press. B. Philadelphia, Pa. April 25, 1885. Ed. Blair Academy, University of Pennsylvania, B. S. Formerly with Martin and Hart Motor Co., Philadelphia, 1905-1906, with J. Hervey Nichols, Jr., Denver, Colo., 1905.

White, Wm. Pierrepont.—Pres. Utica Drop Forge & Tool Co., 75 Genesee St., Utica, N. Y.

Whitehead, B. S.—Pres. Webb Mfg. Co., 60 Shipman St., Newark, N. J.

Whitehouse, H. H.—Sales Mgr. Pier-son Motor Supply Co., 1175 Bedford Ave., Brooklyn, N. Y.

Whiteley Steel Co.—Muncie, Ind. Mfrs. steel castings.

Whiteside Wheel Co.—W 10th St and Canal, Indianapolis, Ind. Mfrs. wheels. Cap. \$200,000. Est. Oct., 1906.

Whitewater Automobile Club.—Whitewater, Wis. T. M. Blackman, Sec

Whitfield, N. B.—143 Park St., New Haven, Conn. (Oldsmobile.)

Whiting, Allan Hart.—Vice Pres. Atlantic Motor Car Co. B. Spuyten Duyvil,

New York, July 26, 1874 Ed. Wilson &

Kellogg School, Sheffield Scientific School of Yale University. Director Atlantic Motor Car Co. Mem. clubs: University, Yale. A. C. A., N. Y. Motor, A. A. A., N. Y. State Auto Ass'n., Northampton, Sigma Phi, Theta Nu Epsilon, Aero C. A., Yale University, Yale Yacht. A. I. E. E.

Res., Hotel Cumberland. Office, 1776 Broadway, New York City. In the trade since Sept. 1, 1896. Used first car 1899.

Recreations: Motoring, boating.

Whiting & Mudgett.—Santa Cruz, Cal. Garage.

Whiting Auto Co., H. E.—22 Park Sq., Motor Mart, Boston, Mass. (Mora.)

Whiting, C. L.—591 Main St., Rochester, N. Y. (Buick)

Whiting Motor Car Co.—Jackson, Mich. Mfrs. gasoline commercial automobiles.

Whitley Motor & Engineering Co.—Fleet St., Coventry, England. Mfrs. automobile motors.

Whitlock Coil Pipe Co., The.—Elmwood St., Hartford, Conn. Mfrs. radiators, coolers, hoods, exhaust, inlet and water pipes. Cap. \$400,000. Est. 1892. Mem. M. & A. M. Arthur S. Hyde, Sec., Treas and Gen. Mgr. New York Office, 85 Liberty St.

Whitman Agricultural Co.—St. Louis, Mo. Mfrs. gasoline commercial automobiles.

Whitman & Barnes Mfg. Co.—Akron, O. Mfrs. drop forgings, wrenches, tools.

Whitman, E. D.—Supt. Richmond Forgings Corp., Belle Isle, Richmond, Va.

Whitman, H. G.—Pres. Bailey Automobile Co., Birnie Ave., Springfield, Mass.

Whitman, R. H.—Powell St., Richford, Vt. (Stanley, Ford, Waltham)

Whitmore, E. T.—750 Main St., Williamantic, Conn. Garage.

Whitney Bros.—Wellsley Hills Sq., Wellesley, Mass. Garage.

Whitney, C. F.—Mgr. and Treas. Park Sq. Auto Station, 43 Columbus Ave., Boston, Mass.

Whitney, E. D.—50 Greene St., Brattleboro, Vt. (Stevens-Duryea.)

Whitney Electrical Instrument Co.—Concord, N. H. Mfrs. ammeters and voltmeters.

Whitney, E. R.—Designer. Commercial Truck Co. of America, 1222 Arcade St., Philadelphia, Pa.



Whitney, F. I.—Vice-Pres. Fouch Disc Wheel Co. Office, Room 11, Tribune Bldg., Minneapolis, Minn.

Whitney, Geo.—Supt. Mora Motor Car Co., Newark, N. Y.

Whitney Mfg. Co., The.—Hartford, Conn. Mfrs. chains, vises and milling machines.

Whitney, R. A.—Sales Mgr. The Bartholomew Co., Peoria, Ill.

Whitney, R. S.—7 Dunlap St., Brunswick, Me. (Jackson, Logan.)

Whittaker, E. F.—Purch. Agt. Waltham Mfg. Co., Waltham, Mass.

Whittaker, H. C.—Wheeling, W. Va. (Pope-Hartford.)

Whittemore, C. C.—123 W. Eagle St., Buffalo, N. Y. Garage.

Whitten, B. D.—Great Falls, Mont. (Holsman.)

Whitten, C. E.—40 Central Ave., Lynn, Mass. (Thomas Flyer.)

Whitten, F. A.—Supt. Landsen Co., 54-56 Lackawana Ave., Newark, N. J.

Whitten, F. R.—Sec. and Adv. Mgr. Automobile dealer and repairer, 24 Murray St., New York City.

Whitten-Gilmore Co.—907 Boylston St., Boston, Mass. (Thomas.)

Whitten, Harry E.—16 Andrew St., Lynn, Mass. (Springfield, Rambler.)

Whitten Motor Car Co.—Broad and Potter Sts., Providence, R. I. (Rambler.)

Whittier, D. L.—Pres. Eclipse Machine Co., Elmira, N. Y.

Whittington, N. T.—Cayuga, Ind. (Holsman.)

Whyte Auto Station, C. F.—109 Waverly St., S. Framingham, Mass. Garage.

Wichita Automobile Co.—Topeka, Kan. (Pope-Hartford.)

Wichita Automobile Co.—123-25 S. Lawrence Ave., Wichita, Kan. (Reo, Rambler, Maxwell, Pope-Waverley, Stoddard-Dayton.)

Wichita Falls Implement Co.—Wichita Falls, Tex. (Waltham.)

Wick, Asbestos.—Selected asbestos fiber spun into a soft, strong wick-like form, used as a packing and insulating material.

Wick, Carburetter.—See Carburetter.

Wick, H. B.—Elyria, O. Garage.

Wicke, J. A.—2nd St., Van Horne, Ia. (Moline.) Est. 1901. J. A. Wicke, Gen. Mgr. Garage, 20 cars. Repairing; supplies.

Wickersbau, R. S.—Gen. Mgr. Grip Nut Co., 152 Lake St., Chicago, Ill., and 500 Fifth Ave., New York City.

Wickersheim, E. F.—515 N. Main St., Santa Ana, Cal. (Jackson.)

Wicks, F. N.—Sec. and Treas. Kalamazoo Spring & Axle Co., Kalamazoo, Mich.

Wickstrom & Schafer.—Kansas City, Mo. (Holsman.)

Wickwire Steel Co.—Office, 1027 White

Bldg., Buffalo, N. Y. Plant, Wireton (Rattlesnake Is.), Buffalo, N. Y. Mfrs. steel.

Widmayer, Frank B.—2312 Broadway, near 84th St., New York City. Selling Agent Indian and Yale motorcycle, supplies and motorcycle parts. Repairing and storage.

Widmer Machine Works.—43-7 Fort St. E., Detroit, Mich. Mfrs. metal gear wheels, rawhide gear wheels and machine work to order.

Width Over All.—The distance from one extreme side of a car to the other extreme side.

Weider Harness Co.—Calumet, Mich. Repairing.

Weiner Aero Club.—(Vienna Aero Club.) Vienna, Austria.

Wiener, L.—Zwolla, Holland. Mfrs. marine motors.

Wiener Lüftschiffer Zeitung.—1 St. Annahoff, Vienna, Austria. (Aeronautical magazine.)

Wieress et Cie.—Liestal, Switzerland. Mfrs. primary batteries.

Wiest, H. G.—Sec., Treas. and Supt. York Electric & Machine Co., 30-34 N. Penn St., York, Pa.

Wight, Ed. L.—Atlanta, Ga. (Pope-Hartford.)

Wight, W. W.—Cornwall, Cal. (Rambler.) Garage.

Wightman, Elmer.—Tulare, Cal. Garage.

Wilcox, Crittenden & Co.—Middletown, Conn. Mfrs. gray iron castings.

Wilcox, E. C.—Pres. Connecticut Telephone & Electric Co., Inc., 70 Britannia St., Meriden, Conn.

Wilcox, H. E.—Pres., Purch. Agt. and Mgr. H. E. Wilcox Motor Car Co., 1030 N. E. Marshall St., Minneapolis, Minn.

Wilcox, Howard A.—Designer and Supt. Reliance Motor Car Co., 89 Fort St. E., Detroit, Mich.

Wilcox, John F.—Vice-Pres. H. E. Wilcox Motor Car Co., 1030 N. E. Marshall St., Minneapolis, Minn.

Wilcox, Lewis E.—Main St., Cor. Grand Ave., Middletown, N. Y. Renting.

Wilcox, M. E.—Providence, R. I. Mfr. wood and metallic bodies.

Wilcox Mfg. Co., D.—Mechanicsburg, Pa. Mfrs. drop forgings.

Wilcox Motor Car Co., H. E.—1030 N. E. Marshall St., Minneapolis, Minn. Makers of the Wolfe car: first marketed in 1906. One model made since. Cap. \$100,000. H. E. Wilcox, Pres., Purch. Agent and Mgr.; John F. Wilcox, Vice-Pres.; Maurice Wolfe, Sales Mgr.; W. R. Cray, Sec.; R. D. Wilcox, Treas.; R. J. Rubesky, Supt.

Wilcox, R. D.—Treas. H. E. Wilcox Motor Car Co., 1030 N. E. Marshall St., Minneapolis, Minn.

Wilcox, W. A.—Westbrook, Conn. Garage.

Wilcox & Co., W. H.—23 Southwark St., London, S. E., England. Mfrs. circulating pumps.

Wilcox, Wallace L.—Central St., Fall River, Mass. (Franklin.)

Wilder, C. D.—Treas. Darracq Motor Car Co., 1989 Broadway, New York City.

Wildern, George R.—Washington Ave., Charlotte, Mich. Repairing.

Wildes, Thomas.—246 Water St., New York City. Mfr. babbitts metal, solder.

Wildmann, Victor.—Offenbach, Germany. Mfr. tire pumps.

Wildman's Auto Garage.—Belmar, N. J. Garage.

Wiley & Son Co., Wm. H.—Box 30, Hartford, Conn. Mfrs. storm aprons, and curtains, automobile covers, lamp covers, tire case, leggings.

Wiley, F. S.—Pres. Crescent Auto & Machine Co., cor. East 2nd and Marr St., Fond du Lac, Wis.

Wiley, W. H.—Treas. and Gen. Mgr. Coppock Motor Car Co., Decatur, Ind.

Wylford et fils.—Tamise, Belgium. Mfrs. marine motors.

Wilhelm, A. J.—Prophetstown, Ill. (Waltham).

Wilhide, J. L. B.—2329 Madison Ave., Baltimore, Md. (Atlas, Frayer-Miller).

Wilkerson, Geo. S.—Youngstown, O. (Rauch and Lang).

Wilkes-Barre Automobile Club.—Dr. E. C. Wagner, Sec., 125 S. Washington St., Wilkes-Barre, Pa.

Wilkesburg Automobile Co.—819 Hay St., Pittsburg, Pa. Garage. (Elmore).

Wilkinson & Co., F. W.—Manchester, England. (Stanley).

Wilkinson, E. J.—617 Clinton St., Fort Wayne, Ind. Garage.

Wilkinson, F. B.—Sec. and Treas. Western Motor Co., Logansport, Ind.

Wilkinson, J.—Designer, H. H. Franklin Mfg. Co., 302 S. Geddes St., Syracuse, N. Y.

Wilkinson, J. Franklin.—Gloucester, Mass. Mfr. foot-levers.

Willard Auto Station.—400 14th St., Washington, D. C. (Dolson, Jackson.)

Willard, Clare.—Allegany, N. Y. Garage.

Willard Co., H. J.—18 Forest Ave., Portland, Me.; Bangor, Me.; 48 Ash St., Lewiston, Me. (Packard, Elmore, Cadillac, Franklin, Winton.)

Willard, J. L.—Purch. Agt. Mora Motor Car Co., Newark, N. Y.

Willard Storage Battery Co.—1279-1281 Bank St., Cleveland, O. Mfrs. storage and ignition batteries. Cap. \$250,000; \$100,000 paid. Est. 16 years. T. A. Willard, Pres.; E. V. Stebbins, Vice-Pres. and Gen. Mgr.; J. A. Richmond, Sec. and Treas.; R. Norburg, Supt.; G. S. Rankin, Chief Accountant; B. S. Brown, Purch. Agt.

Willard, T. A.—Pres. Willard Storage

Battery Co., 1279-81 Bank St., Cleveland, Ohio.

Willet Engine & Carbureter Co.—764 Ellicott Sq., Buffalo, N. Y. Mfrs. carbureters, gasoline automobile and marine motors.

Willets, W. W.—Vice-Pres. Curtain Supply Co., 85-93 Ohio St., Chicago, Ill.

Willey, C. A.—Hunter's Point, New York. Mfr. varnishes.

Williams et Cie.—1 rue Caumartin, Paris, France. Mfrs. wearing apparel, coats.

Williams & Co., J. H.—150 Hamilton Ave., Brooklyn, N. Y. Mfrs. drop forgings, wrenches.

Williams & Son, E. A.—107 Plymouth St., Jersey City, N. J. Mfrs. babbitt metals, bushings, bearings, aluminum, brass and bronze castings, crank cases, engine cases. Cap. \$300,000. Est. 1857. Thomas H. Williams, Jr., Gen. Mgr.

Williams & Son, J. C.—Orange, Cal. (Reo.)

Williams & Son, J. J.—109 Main St., Montpelier, Vt. (Buick, Pope-Hartford.)

Williams, A. A.—Pres., Mgr. and Supt. Duluth Gas Engine Works, Cor. Vine St. and Minnesota Ave., Duluth, Minn.

Williams, A. S.—Pres. Berkshire Cycle & Auto Co., 95 Main St., North Adams, Mass.

Williams Auto Co., R. O.—621-3 Broad St., Columbus, O. (Stearns.)

Williams Co., The John.—114-18 Liberty St., New York City. Mfrs. steam engines.

Williams, E. Q.—533 S. Clinton St., Syracuse, N. Y. Mfr. ammeters and voltmeters, spark coils, spark plugs, electric switches.

Williams, E. S.—Sec. Continental Caoutchouc Co., 43 Warren St., 2100 Broadway, New York City.

Williams, Fred.—224 16th St., Denver, Colo. Repairing.

Williams, F. Y.—Mgr. Lothrop Davis Co., 105 Main St., Tonopah, Nev.

Williams, Harrison.—Pres. Waltham Mfg. Co., Waltham, Mass.

Williams, Harry.—Sec. and Treas. Motz Clincher Tire & Rubber Co., Akron, O.

Williams, Harvey R.—Lancaster, Pa. (Queen.)

Williams, Jas. C.—Sec. Palace Auto Co., 1408-10 Walnut St., Kansas City, Mo.

Williams, J. H.—Monroe, Wis. (Jewell.)

Williams, John.—464 Pleasant St., Fall River, Mass. (Reo.)

Williams, John R.—2nd Vice-Pres. Electric Storage Battery Co., Allegheny Ave. and 19th St., Philadelphia, Pa.

Williams, M. L.—Prop. Twentieth Cen-

tury Motor Car Co., 121-25 S. Lafayette St., South Bend, Ind.

Williams Motor Car Co.—Akron, O. Garage.

Williams, Philip A., Jr.—Sales Mgr. Atlas Motor Car Co., Birnie Ave., Springfield, Mass.

Williams, R. H.—Mgr. Baltimore, Md., Branch Winton Motor Carriage Co.

Williams, Roger H.—Treas. The Eaton Cole & Burnham Co., Bridgeport, Conn.

Williams, Thomas H.—Gen. Mgr. E. A. Williams & Son, 107 Plymouth St., Jersey City, N. J.

Williams, T. J.—Des Moines, Ia. (Holsman.)

Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, O. Mfrs. carburettors, brass, bronze, aluminum and copper castings, brass couplings, brass pipe fittings, grease cups, lubricators, oil cups, oil pumps, gasoline strainers, safety valves, throttle valves.

Williams-Wittlesey Co.—Long Island City, L. I., N. Y. Mfrs. motorboats.

Williams, Wm. J.—Vice-Pres. Draper Bros. Co., Canton, Mass.

Williams, W. R.—Vice-Pres. and Treas. Richmond Forgings Corp., Beile Isle, Richmond, Va.

Williamsburg Automobile & Storage Co.—159 Clymer St., Brooklyn, N. Y. (Autocar.) Garage.

Williamson, W. S.—123 Liberty St., New York City. Rubber goods.

Williamson, W. S.—220 Clifton Pl., Brooklyn, N. Y. (Holsman.)

Williamsport Auto Exchange.—599 W. 3rd St., Williamsport, Pa. (Maxwell, Premier, White.)

Williamsport Automobile Club.—Williamsport, Pa. F. Grant Sweet, Sec.

Willink Garage.—Flatbush and Ocean Ave., Brooklyn, N. Y. (Marmon.)

Willink, Gebrüder.—12 Paleistrasse Amsterdam, Holland. Mfr. marine motors.

Willis Co., E. J.—8 Park Pl., New York City. Est. 1892. Supply house. E. J. Willis, Pres. and Treas.; Wm. Baker, Vice-Pres.; Wm. B. Myers, Sec.

Willis, E. J.—Pres. and Treas. E. J. Willis Co., 8 Park Pl., New York City.

Willis, F. B.—Sec. Fisher Auto Co., 330 N. Illinois St., Indianapolis, Ind.

Williston Cycle Agency.—Williston, Md. Garage.

Willocq-Bottin.—33 square Gutenberg, Brussels, Belgium. Mfrs. acetylene lamps, oil lamps.

Willoughby Co.—86 Genesee St., Utica, N. Y. Mfrs. wood and metallic bodies.

Willoughby, S. W.—27 W. Bridge St., Grand Rapids, Mich. Repairing.

Willow St. Motor Car Repair Co.—Willow St., Fitchburg, Mass. (Rambler.)

Wills, Geo. E.—84 Court St., Auburn, Me. (Holsman.)

Willss, August.—Eisenach, Germany. Mfr. wearing apparel, fur coats.

Willyoung Appliance Co.—Ludlow Station, Yonkers, N. Y. Mfrs. ignition coils, magnetos, spark plugs, tire chain grips, shock absorbers and combustion engines. Cap. \$125,000. Est. Feb. 26, 1907. Elmer G. Willyoung, Pres.; Geo. M. Conner, Sec.; Jerome Bradley, Treas.; Benjamin Biscoe, J. D. Maxwell, Directors; Geo. Helfrich, Asst. Sec. and Office Mgr.; Louis E. Shaw, Chief Engineer; Ewald Raves, Gen. Supt.; Elmer G. Willyoung, Mgr.

Willyoung, Elmer G.—Pres., Gen. Mgr. and Director Willyoung Appliance Co., Ludlow Station, Yonkers, N. Y.

Willys Crew Motor Car Co.—117-19 Main St., Elmira, N. Y. (Rambler, White, Premier, Pope-Waverley, Ford, American.) Garage; supplies; repairing.

Wilmarth & Morman Co.—585 Canal St., Grand Rapids, Mich. Mfrs. drill grinders, surface grinders, arbor presses, friction countershafts, Nelson patent pulleys. Cap. authorized, \$50,000; paid in and surplus, \$40,000. Est. 1900. L. T. Wilmarth, Pres. and Gen. Mgr.; S. A. Morman, Vice-Pres.; Chas. E. Meech, Sec. and Treas.; E. T. Gorham, Supt. Above officers are also directors.

Wilmarth, L. T.—Pres., Gen. Mgr. and Director Wilmarth and Morman Co., 585 Canal St., Grand Rapids, Mich.

Wilmington Auto Co.—Delaware and 10th Sts., Wilmington, Del. (Autocar, Franklin, Winton.)

Wilmington Malleable Iron Co.—Wilmington, Del. Mfrs. malleable iron castings, steel castings.

Wilner, Elias R.—Sec. and Gen. Mgr. Manhattan Screw & Stamping Works, West End Ave. and 67th St., New York City.

Wilner, Samuel.—Pres. Manhattan Screw & Stamping Works, West End Ave. and 67th St., New York City.

Wilson, A. H.—2nd and Market Sts., Canton, O. (Cadillac, Winton, Northern.)

Wilson & Co., F. Cortez.—239-41 Lake St., Chicago, Ill. Mfrs. underground gasoline storage outfits, lubricating oil tanks, gasoline measures, funnels, floor pans, luggage carriers, cooking outfits, acetylene generators, pumps. Est. 1869. C. E. Wilson, Owner; George Landis Wilson, Mgr.

Wilson & Co.—142 Bank St., Ottawa, Can. (Pierce Arrow, Franklin.)

Wilson & Ellett Motor Car Co.—Alliance, O. (Cadillac, Winton.)

Wilson, A. S.—23 Cooper St., Woodbury, N. J. (Ford, Studebaker.)

Wilson, A. S.—1548 Broadway, Denver, Colo. (Earl, Ford, Columbus, Dragon.)

Wilson Automatic Clock Co.—935 Arch St., Philadelphia, Pa. Mfrs. automobile clocks.

Wilson Automobile Co.—117 Craig St., West, Montreal, Canada. (Buick, Babcock, Pierce Arrow, Rapid, Franklin.)

Wilson Automobile Co., Ltd.—142 Bank St., Ottawa, Canada. (Stoddard-Dayton.)

Wilson Automobile Co.—118 St. Lawrence Ave., Wichita, Kan. (Stearns, Northern.)

Wilson, C. A.—South Bethlehem, Pa. Garage.

Wilson, C. D.—Sec. and Treas. Hamilton Motor Car Co., 26 N. 2nd St., Hamilton, O.

Wilson, C. D. & Parrish, L. M.—Hamilton, O. Garage.

Wilson, C. E.—Owner F. Cortez Wilson & Co., 239-41 Lake St., Chicago, Ill.

Wilson, C. H.—Vice-Pres. C. R. Wilson Body Co., Detroit, Mich.

Wilson Co., D. B.—13 E. Main St., Waterbury, Conn. (Maxwell.)

Wilson, C. R.—Pres. and Gen. Mgr. C. R. Wilson Body Co., Detroit, Mich.

Wilson Body Co., C. R.—Detroit, Mich. Mfrs. automobile bodies, wood, steel or aluminum. Member M. & A. M. Cap. \$50,000. Est. 35 years. C. R. Wilson, Pres., Supt. and Gen. Mgr.; C. H. Wilson, Vice-Pres.; P. D. Dwight, Sec. and Treas.

Wilson, C. R.—Director Wayne Automobile Co., Piquette and Brush Sts., Detroit, Mich.

Wilson, E. C.—Richfield, Kan. (Holzman.)

Wilson, E. L.—Treas. Kinsey & Mahler Co., 400 S. Adams St., Peoria, Ill.

Wilson, G. B.—Treas. The Safety Insulated Wire & Cable Co., 114 Liberty St., New York City. Factory, Bayonne, N. J.

Wilson, Geo. L.—Mgr. F. Cortez Wilson & Co., 239-41 Lake St., Chicago, Ill.

Wilson, G. L.—Asst. Factory Mgr. National Auto Top Co. Main Office, 1904 Broadway. Factory, 244-50 W. 49th St., New York City.

Wilson, Jack.—Hd. of Rep. Dept. Hamilton Garage Co., 133-5 King St. W., Hamilton, O.

Wilson, J.—Foreman J. E. Crane, 922-30 18th St., Denver, Colo.

Wilson, Jim P.—Alpine, Tex. (Waltham.)

Wilson, John A., Jr.—Supt. Automobile Dept. Noye Mfg. Co., 50 Lake View Ave., Buffalo, N. Y.

Wilson, R. A.—Supt. Long Arm System Co., Lakeside Ave. and E. 38th St., Cleveland, O.

Wilson, Sam J.—Eau Claire, Wis. (Jackson.)

Wilson, Thos. H.—Detroit Club. Detroit, Mich. (Stearns.)

Wilson, T. H.—215 Seneca St., Canajoharie, N. Y. Garage.

Wilson, W. Grant.—2343 Military St., Port Huron, Mich. (Maxwell.)

Wilson, Wm. P.—Hd. of Oil Pump Dept. Detroit Lubricator Co., Trumbull Ave., Lincoln Ave. and G. T. Ry., Detroit, Mich.

Wilson's Garage.—Savannah, Ga. (Pope.)

Wilson's Garage.—Wells, Md. (White.)

Wincapaw & Co., C. C.—Prince's Bay, N. Y. (Waltham.)

Wincer and Co., C.—Brace St., Wall-sall-on-Thames, England Mfrs. carburettors.

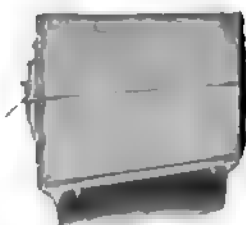
Winchendon Auto Transit Co.—Winchendon, Mass. Garage.

Winchester Automobile Co.—Winchester, Mass. Garage.

Winchester Speedometer Co., Inc.—Mortor Mart, 62nd St., and Broadway, New York City. Mfrs. speedometers.

Wind, Resistance of.—See Atmosphere.

Wind-screen.—A large plate of glass set into a frame and placed in the front



part of a car to protect the occupants from the rush of wind when the car is running fast; or in the forward part of a motor-boat to protect the passengers from both wind and spray.

Wind, Velocity.—See Atmosphere.

Windham Patent Bodies.—Clapham Junction Station, London, England. Mfrs. bodies.

Windhoff Frères.—100 ave. Parmentier, Paris, France. Mfrs. radiators.

Windhoff, Gebrüder.—Rheine-im-Westphalia, Germany. Mfr automobile motors, radiators, carburettors.

Windiate & Vandenbrooks.—Craps Bldg., Bay City, Mich. (Maxwell.)

Windsor Auto Co.—115 W. 37th St., New York City. Garage.

Windsor Spring Co., The.—Kenosha, Wis. Mfrs. seat springs.

Wine, E. H.—Harrisburg, Va. (Ramler.)

Wing.—A guard made of metal or other material, called also "mud-guard," placed at each side of a car to prevent the splashing of mud over the vehicle and its occupants. (2) A term sometimes used as a synonym for "fin," "flange," "gill" or "rib." q. v. (3) One of the vanes of a fan.

Wing & Co, Charles.—Amesbury, Mass. Mfrs. and wholesale dealers Mfrs. cushion springs, automobile strapping. Dealers leather for upholstery, and all other upholstering materials, hardware. Cap. \$60,000. Est. 1840. Inc. 1893. Wm. W. Hawkes, Pres. and Treas.; Charles A. Stein, Sec.

Wing, F. A.—Mgr. Broadway Automobile Co., Broadway and Madison St., Seattle, Wash.

Wing-iron.—A stay used to support the mud-guards of motor-cars.

Wing-nut.—See Nut, Wing.

Wing-transom.—In vessels, the uppermost transom of the stern-frame.

Wing-valve.—See Valve, Wing.

Wing Motor Car Co., F. E.—12 Columbus Ave., Boston, Mass. (Marmon.)

Wink, W. F.—Treas. Berwin Automobile Co., 128-32 N. 8th St., Allentown, Pa.

Winkley Co., The.—226 Abbot St., Detroit, Mich. Mfrs. carburetters, grease cups, lubricators, oil cups, oil guns, gasoline strainers.



Winkley, Robert Lefavour.—Confidential Sec. B. Boston, Mass., March 28, 1858. Ed. Westfield State Normal School, Trinity College, Hartford, Conn. Res., Hemenway, Chambers. Office, 221 Columbus Ave., Boston, Mass.

Winn, C. H.—621 South St., Peekskill, N. Y. Garage.

Winn, Wm. R.—143 Maiden Lane, New York City. Mfr. lubricating oils, steam packing, rubber hose and automobile supplies.

Winship, W. W.—71 Summer St. and 11 Kingston St., Boston, Mass. Mfr. trunks, lunch baskets, robes, leather pockets, automobile record trip books, automobile baggage. Est. 1847.

Winslow, A. S.—New Rochelle, N. Y. (Cadillac)

Winston, F. G., Jr.—709 Hennepin Ave., Minneapolis, Minn. (Columbia, Oldsmobile, Waltham, Woods.)

Winter-Darnell Auto Co.—3rd and Market St., Alton, Ill. (Jackson.)

Winter, Gustav.—Zittau, Germany. Mfr. bodies

Winton, Alexander.—Pres and active head of the Winton Motor Carriage Co.

B. Grangemouth, Scotland, June 20, 1860. Ed. Scottish schools. Director Winton Motor Carriage Co., Cleveland Cap Screw Co., Lindsay Wire Weaving Co. Mem. clubs: A. C. A. Cleveland A. C. Clifton, Lakewood Yacht, (Commodore),



Cleveland Engineers' Res., Roseneath, Lake Ave., Lakewood, O. Address, Berea Road, N. W., Cleveland, O. Recreation, Boating.

Winton Garage.—406 N. Clark St., Chicago, Ill. Repairing.

Winton Motor Car Co.—1226 Huron Rd., Cleveland, O. (Winton.) C. M. Brockway, Mgr.

Winton Motor Carriage Co.—Broadway and 70th St., New York City. (Winton.) C. W. Churchill, Mgr.

Winton Motor Carriage Co.—Baltimore, Md. (Winton.) R. H. Williams, Mgr.

Winton Motor Carriage Co.—715 E. Pine St., Seattle, Wash. (Winton.) G. W. Miller, Mgr.

Winton Motor Carriage Co.—San Francisco, Cal. (Winton.) Chas. M. Brown, Mgr.

Winton Motor Carriage Co., The.—246-48 N. Broad St., Philadelphia, Pa. (Winton.) Est. 1902. A. E. Maltby, Mgr.; Geo. E. Conrad, Asst. Mgr. Garage, about 50 cars; repairing.

Winton Motor Carriage Co.—248-52 Jefferson Ave., Detroit, Mich. (Winton.) T. W. Henderson, Mgr.

Winton Motor Carriage Co.—Pittsburg, Pa. (Winton.) Earl Kiser, Mgr.

Winton Motor Carriage Co.—1 Stanhope St., Boston, Mass. (Winton.) P. A. Hinchliffe, Mgr.

Winton Motor Carriage Co.—1259 Michigan Ave., Chicago, Ill. (Winton.) B. C. Day, Mgr.

Winton Motor Carriage Co.—London, England. (Winton.) W. L. Duck, Mgr.

Winton Motor Carriage Co., The.—Berea Rd., Cleveland, O. Makers of the Winton car; first marketed in 1897. Sixteen models made since. Cap. \$1,000,000. Alexander Winton, Pres.; Thos. Henderson, Vice-Pres.;



GEO. H. BROWN
Sec. and Treas. Winton Motor Carriage Co.

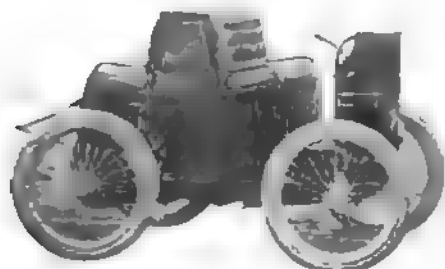
son, Vice-Pres.; Geo. H. Brown, Sec and Treas.; Chas. B. Shanks, Gen. Sales Mgr.; H. B. Anderson, Engineer; J. F. Weidig, Supt.; E. C. Ranney, Purch. Agt.; Chas. W. Mears Advt. Mgr. Branches: Boston, F. A. Hinchliffe, Mgr.; Chicago, C. M. Brown, Mgr.; Cleveland, C. M. Brockway, Mgr.; Detroit, F.

W. Henderson, Mgr.; London, W. L. Duck, Mgr.; New York City, C. W. Churchill, Mgr.; Philadelphia, A. E. Maltby, Mgr.; Pittsburg, Earl Kiser, Mgr.; Seattle, Wash., G. W. Miller, Mgr.; San Francisco, Chas. M. Brown, Mgr.;

Baltimore, R. H. Williams, Mgr. Historical:

First long distance automobile tour in America—Cleveland to New York, July 28 to August 7, 1897, by Alexander Winton. This trip was duplicated by Mr. Winton in May, 1899, and in November, 1900. First automobile trip from coast to coast (San Francisco to New York), May 23 to July 26, 1903, by Dr. H. Nelson Jackson in Winton two-cylinder car. First automobile trip from Mexico to Puget Sound (Seattle), May 8 to June 7, 1904, by C. L. Roy in two-cylinder Winton car.

First tonneau car made in America was the 1902 Winton two-cylinder touring car, produced in the fall of 1901. The first four-cylinder horizontal in America



First multiple cylinder car built in the United States, Winton 1896. Two vertical cylinders, water-cooled.

was the Winton Quad, made in the summer of 1904. The first eight-cylinder car in America was the Winton Bullet No. 2, built by Alexander Winton in 1903 and successfully raced on the track for three years by Mr. Winton, Barney Oldfield and Earl H. Kiser.

World's record (track) made by Winton cars (one mile): Alexander Winton, driver, 1.47, Cleveland, May 30, 1897; 1.33 2-5, Chicago, Sept. 18, 1900; 1.12 2-5, Detroit, Oct. 10, 1901; 1.09, Detroit, Oct. 23, 1901; 1.06 4-5, Detroit, Oct. 24, 1901; 1.02 1/4, Cleveland, Sept. 16, 1902. Barney Oldfield, driver, 1.00, Columbus, August 28, 1903; .59, Cleveland, Sept. 4, 1903; .57 1/4, New York, Oct. 3, 1903; .56 4-5, New York, Oct. 3, 1903; .56, New York, Oct. 3, 1903; .55 1-5, Los Angeles, Nov. 20, 1903; .55, Los Angeles, Nov. 20, 1903; .54 4-5, Los Angeles, Nov. 22, 1903. Earl H. Kiser, driver, .54, Cleveland, August 22, 1904; .52 4-5, Cleveland, August 22, 1904.

Wipe-contact.—See Contact-maker.

Wipe-spark.—See Ignition.

Wiper.—A cam projecting from a horizontal shaft and acting periodically upon a toe, the elevation of which lifts the valve-rod and poppet-valve in a steam-engine.

Wire.—A cylinder of very small diameter, made by drawing an iron, brass, copper or steel rod through a hole in a steel plate of slightly smaller diameter

than the rod. The process is repeated with successively smaller holes until wire of the requisite fineness has been obtained.

Wire Belt.—See Belt.

Wire, Bowden.—See Transmission, Flexible.

Wire Cable.—A cable formed of a number of steel wires, whereby great flexibility and strength is given to it. It is used in some cars for operating brakes.

Wire-cloth.—A fabric of woven wire, used on motor-cars as a straining material. See Wire-gauze.

Wire, Conducting.—Any wire employed to conduct an electric current.

Wire, Copper.—The wire used for all electric wiring, since it is the best conductor of electricity after silver, which is too expensive for electrical work.

Wire, Cross.—A non-skid consisting of projections on the tread of a pneumatic tire, often incorporated with the tire itself.

Wire-drawing.—The operation of making wire by drawing a rod of metal through a hole in a steel plate of slightly smaller diameter than the rod, and repeating the process with successively smaller holes until the wire of requisite fineness has been obtained. (2) The reduction of the pressure of steam or other motive fluid by friction when it is caused to flow through a small or narrow passage.

Wire, Earth.—See Wire, Ground.

Wire-edge.—The thin burr thrown up on the edge of a tool during grinding or sharpening on stone.

Wire, Electric.—A name commonly given to "conductors" of electricity, which are always of copper wound with cotton or covered with an insulating material consisting of gutta percha or vulcanized rubber. Flexible wires are small cables composed of a large number of very fine wires.

Wire, Flexible.—See Wire, Electric.

Wire, Fuse.—A wire made of a lead alloy, having a low melting point, and inserted in an electric circuit of smaller section than the conducting wires so that, in the event of an excessive current passing, the fuse melts before any damage has been done to the other wires.

Wire-gauge.—See Gauge, Wire.

Wire-gauze.—See Gauze, Wire and Wire cloth.

Wire, Ground.—The wire employed to connect the "ground" (see Ground) terminal of the coil to any part of the motor or frame.

Wire, High-tension.—Same as secondary wire, q. v.

Wire, Insulated.—See Wire, Electric.

Wire, Iron.—Fine, soft iron wire is

used for forming the core of an induction-coil, q. v.

Wire, Low-tension.—Same as primary wire, q. v.

Wire, Platinum.—Platinum wire is used in making small incandescent lamps, and is employed also as a material for the electrodes of spark-plugs.

Wire, Primary.—The coarse insulated wire winding of an induction-coil. See Coil, Induction and Wire, Low Tension.

Wire Rope.—The same as wire cable.

Wire, Secondary.—The wire of an induction coil in which a high tension current is induced. See Coil, Induction.

Wire, Steel.—A wire used according to gauge, for making cables, belts, spokes for wire wheels, for operating a throttle lever, etc.

Wisconsin Graphite Co.—Allegheny, Pa. Mfrs. crucibles, graphite, grease.

Wisconsin Motorcycle Co.—Monroe, Wis. (Indian).

Wisconsin State Automobile Association.—Milwaukee, Wis. Org. May, 18, 1907. Neal Brown, Wausau, Wis.; Pres.; C. O. Josslyn, Oshkosh, Wis., 1st Vice-Pres.; M. C. Moore, Milwaukee, Wis., 2nd Vice-Pres.; James T. Drought, 97 Wisconsin St., Milwaukee, Wis.; Sec.; George A. West, Milwaukee, Wis.; Treas. Membership: Beloit Automobile Club, Janesville Automobile Club, Milwaukee A. C., Oshkosh A. C., Portage A. C., Whitewater A. C.

Wisconsin Wagon Co.—Madison, Wis. Garage.

Wise, S. J.—Sales Mgr. Garford Motor Car Co., 1540-42 Broadway, New York City.

Wishart Machine Works, John.—63 65 S. Canal St., Chicago, Ill. Mfrs. vulcanizers.

Wiss & Bros., Victor A.—12 Pine St., Morristown, N. J. (Cadillac).

Wichita Automobile Club.—Scott Wynne, Sec., Wichita, Kan.

Withee, W. W.—La Crosse, Wis. (Mitchell).

Witherbee Igniter Co.—541 W. 43rd St., New York City. Mfrs. storage batteries, spark plugs, coils, switches, timers, wire, boat electric fittings. Member M. & A. M. Cap. \$50,000. Est. 5 years. William Barret Ridgely, Pres.; Alimand B. Elliott, Vice-Pres.; Alfred S. Watson, Sec. and Treas.; Albert J. Fisk, Gen. Mgr.; F. E. Roth, Supt.; M. F. Maury Werth, Marine Dept.; Theodore Goetz, Sales Dept.; W. W. Robinson, Adv. Mgr.; Alimand B. Elliott, Electrical Engineer.

Witherbee Mfg. Co., Inc.—433 W. 42nd St., New York City. Mfrs. dealers and agents; storage batteries, coils, timers, plugs, electric motors and generators, automobile parts, gas engines. Cap. \$100,000. Est. March, 1907. Thos. S.

Witherbee, Pres.; Harry H. Cooley, Treas.; John H. Hendrick, Sec.; Thos. S. Witherbee, Gen. Mgr.; H. F. Kenneal, Supt.

Withers & Co., Ltd.—35 Edgware Rd., London W., England. Mfrs. gasolene automobiles (Withers).

Withington, P. H.—Pres. Geo. A. McKeel Co., Jackson, Mich.

Withington, S. S.—Vice-Pres. Adrian Steel Casting Co., Beecher St., Adrian, Mich.

Withington, Winthrop.—Vice-Pres. Geo. A. McKeel Co., Jackson, Mich.

Witter & Hock.—Storm Lake, Ia. Garage.

Wittman Co.—205 S. 11th St., Lincoln, Neb. (Pope-Toledo, Pope-Hartford, Pope-Waverley).

Witz, J. L.—Staunton, Va. (Pope-Hartford).

Woelk, W. N., Jr.—Larned, Kan. Garage.

Wogaman, J. Webster.—Union City, Ind. Mfr. wood and metallic bodies.

Wolcott, L. A.—Huntington, W. Va. (Cadillac).

Wolf, J., Lindgren, A., & Weber, M.—La Porte, Ind. Garage.

Wolf, John.—Michigan City, Ind. (Winton).

Wolf, John F.—Forge and Willow Sts., Lebanon, Pa. (Indian).

Wolf, M. L.—710 Gay St., Knoxville, Tenn. Est. September, 1893. M. L. Wolf, Hd. Depts. Garage, 75 cars. Repairing.

Wolf Pederson Automobile & Machine Co.—1219 Devon Ave., Chicago, Ill. Garage.

Wolfram.—See Tungsten.

Wolf und Struck.—Vaals, Holland. Mfrs. marine motors.

Wolf, William.—Vice-Pres. Motz Clincher Tire & Rubber Co., Akron, O.

Wolfe, F. D.—San Jose, Cal. (Jewel).

Wolfe, Lewis C.—Mgr. automobile dept. W. H. and L. C. Wolfe, 1011 Chestnut Ave., Altoona, Pa.

Wolfe, M. J.—Prop. Williamsburg Auto & Storage Co., 159 Clymer St., Brooklyn, N. Y.

Wolfe, Maurice.—Sales Mgr. of the H. E. Wilcox Motor Car Co., 1030 N. E. Marshall St., Minneapolis, Minn.

Wolfe, W. H. & L. C.—1011 Chestnut Ave., Altoona, Pa. (Thomas, Winton, Studebaker, Pope-Toledo, Autocar, Buick). Est. 1901. Lewis C. Wolfe, Mgr. automobile dept.; O. J. Evans, Foreman. Garage, 35 cars. Gen. repairs, sundries and tires.

Wollenzier.—Hd. of press room Globe Machine & Stamping Co., 3868 Hamilton Ave. N. E., Cleveland, O.

Wolseley Tool & Motorcar Co.—Adlerley Park, Birmingham, England. Mfrs. gasolene automobiles (Wolseley cars, Sidley cars), marine motors.

Wolsit, Fabbrica di Automobili.—Turin, Italy. Mfrs. gasoline automobiles (Wolsit cars).

Wolven, E. J.—Worthington, Minn. (Rambler).

Wolverine Auto & Commercial Vehicle Co.—Dundee, Mich. Garage.

Wolverine Leather Goods Co.—59 E. Fort St., Detroit, Mich. Mfrs. leather, leather washers.

Wolverine Motor Works.—130 S. Front St., Grand Rapids, Mich. Mfrs. motorboats, gasoline marine and kerosene motors.

Wolverine Radiator Co.—Detroit, Mich. Mfrs. radiators.

Wolverton, Thos. C.—537-539 Mercer St., Jersey City, N. J. (Maxwell).

Women's Motor Club of Chicago.—Chicago, Ill. Mrs. A. F. Chase, Sec.

Wood & Barnett.—1333 Broadway, Denver, Colo. (Stoddard-Dayton). Est. 1905.

Wood & Son, Frederick R.—219 W. 19th St., New York City. Mfrs. storm aprons and curtains, wood and metallic bodies, automobile covers and tops.

Wood Alcohol.—See Alcohol, Wood.

Wood, Allan.—Coudersport, Pa. Garage.

Wood Automobile Co., Frank B.—60-62 River St., Elgin, Ill. (Ford, Rambler, Kisselkar). Est. Jan. 1, 1907. Garage, 40 cars. Repairing.

Wood, Ben.—Sec. Darracq Motor Car Co., 1989 Broadway, New York City.

Wood, B. F.—City Island, N. Y. Mfr. motorboats.

Wood Bros.—Santa Cruz, Cal. Garage.

Wood, C. E.—Vice-Pres. Pope Automobile Co. of Washington, 817-819 14th St. N. W., Washington, D. C.

Wood, Colbin C.—Plymouth, Mass. (Lambert).

Wood, Harry.—Care of Dayton Auto Co., Dayton, O. (Jewel).

Wood, H. Holton.—Vice-Pres. Duplex Rolling Bushing Co., Belfast, Me.

Wood, J. Elmer.—106-110 Rantoul St., Beverly, Mass. (Stanley). Est. 1897. Garage, 35 cars; repairing.

Wood, John D.—Geneseo, Ill. (Cameron).

Wood Screw.—See Screw, Wood.

Wood, William P.—Treas., Mgr. and Director Pittsfield Spark Coil Co., Dalton, Mass.

Wood, W. W.—133 Greene St., Marietta, O. (Maxwell).

Woodbridge, J. E.—Pres., Treas. and Mgr. The A. Z. Co., 527 W. 56th St., New York City.

Woodbridge, R. S.—Sec. The A. Z. Co., 527 W. 56th St., New York City.

Woodbury, E. P.—Burlington, Vt. (Cadillac).

Woodford, J. M.—Elkins, W. Va. (Waltham).

Woodin, C. D.—St. Joseph, Mich. Garage.

Woodland Auto Garage.—6430 Jackson Park Ave., Chicago, Ill. Garage.

Woodland Garage.—Woodland, Cal. Garage.

Woodlawn Auto Station.—6310 Woodlawn Ave., Chicago, Ill. Garage.

Woodmans Sons, C. B.—Westbrook, Me. (Jewel).

Woodmont Garage & Livery.—Woodmont, Conn. Garage.

Wood-Redington Machinery Co.—Cota, and Anacapa Sts., Santa Barbara, Cal. Garage.

Woodruff & Sons Co., Walter W.—Mount Carmel, Conn. Mfrs. hardware, mountings and specialties. Cap. \$80,000. Est. 1835. Arthur E. Woodruff, Pres. and Treas.; Harry P. Woodruff, Sec.

Woodruff, A. A.—Mgr. automobile dept., Schubert Bros. Gear Co., 42-44 Cedar St., Oneda, N. Y.

Woodruff, Arthur E.—Pres. and Treas. Walter W. Woodruff & Sons Co., Mount Carmel, Conn.

Woodruff, Harry P.—Sec. Walter W. Woodruff & Son's Co., Mount Carmel, Conn.

Woods & Co., C. W.—Timuru, N. Zealand. (Monarch).

Woods Motor Vehicle Co.—945 8th Ave., New York City. (Woods).

Woods Motor Vehicle Co.—Factory, 2515-2521 Calumet Ave., 2510-2520 Cottage Grove Ave. Salesrooms, 1408 Michigan Ave., Chicago, Ill. Mfrs. gasoline and electric automobiles (Woods).

Woods, Wm. F., & Chas. E.—18 Congress St., Portsmouth, N. H. (Cadillac).

Woodward, C. F.—Pres. The Woodward-Reopell Co., 18-20 Fort St., Springfield, Mass.

Woodward, C. M.—Treas. The Woodward-Reopell Co., 18-20 Fort St., Springfield, Mass.

Woodward-Reopell Co., The.—18-20 Fort St., Springfield, Mass. (Stoddard-Dayton). Est. 1905. Cap. \$10,000. C. M. Woodward, Treas.; C. F. Woodward, Pres.; A. V. Reopell, Mgr. Garage, 25 cars; repairing.

Woodwell Co., Jos.—201 Wood St., Pittsburg, Pa. Supplies.

Woodworth Bros.—2 Hartford St., Newton Highland, Mass. Garage.

Woodworth, C. C.—Aguascalientes, Mex. (Waltham).

Woodworth, Charles B.—Officer Leather Tire Goods Co., 325 Boylston St., Newton Upper Falls, Mass.

Woodworth, D.—Officer Leather Tire Goods Co., 1325 Boylston St., Newton Upper Falls, Mass.

Woodyard, C. C.—Parkersburg, W. Va. (Waltham).

Wool-slag.—A material, called also "silicate cotton" and "silicate wool," composed of very thin filaments of blast-furnace slag. It is used as a "lagging" and as an abrasive. See Lagging.

Woolman, Maurice.—Council Bluffs, Ia. (Haynes).

Wooster Auto Co.—88 Chambers St., New York City. Supply house.

Worcester Automobile Club.—44 Front St., Worcester, Mass. Organized Feb. 6th, 1901, "to develop motor-vehicles and good roads." Charter members: O. M. Savels, R. M. Garfield, J. L. Rhodes, T. J. Toner, F. Goddard, F. S. Taylor, R. G. Bicknell, G. B. Cutting, J. W. Harrington, J. W. Higgins, Alex. Bowler, B. A. Robinson, F. H. Hamblin, H. E. Shiland, J. P. Coglin, Pres.; D. F. Gay, Vice-Pres. and Chairman Membership and Laws and Ordinance Committee; F. E. Frost, Sec.; W. B. Stark, Treas.; M. P. Whittall, Chairman Runs and Tours Committee; W. E. Hassem, Chairman Highways Committee; W. N. Stark, Chairman House Committee; James W. Bigalow, Asa Goddard, former pres'ts. Conducted Dead Horse Hill climb, May, 1905, and May, 1906.

Worcester Machine Screw Co.—Worcester, Mass. Mfrs. bolts and nuts, machine screw products.

Worcester Pressed Steel Co.—Cor. N. and Barber Aves., Worcester, Mass. Mfrs. automobile, bicycle and motorcycle fittings, brake drums, ball cups, dust caps, heads, head fittings, clusters, brackets, braces, carburetter parts and all kinds of stamped specialties, flanges. Member: Cycle Parts and Accessory Mfrs. Assn. Cap. \$100,000. Est. 1883. Inc. 1904. Milton P. Higgins, Pres.; George I. Alden, Treas.; John W. Higgins, Sec. and Gen. Mgr.; Eveleth V. Hill, Sales Mgr.; Arthur P. Higgins, Purch. Dept.; E. W. Ward, Accounting Dept.; A. G. Anderson, supt. factory. Chicago office, 1064 Monadnock Block.

Worcester Steel Foundry Co.—Millbury, Mass. Mfrs. crucible steel castings, crank shafts, gearing. Cap. \$300,000. Est. 1905. William Pestell, Pres. and Gen. Mgr.; V. H. Moody, Treas.

Work.—The product of a force by the length upon which it acts in the direction of its motion. The C. G. S. unit of work is the "erg" or dynecentimetre. The practical unit of work or energy is the "kilogrammetre." It is the work done when a weight of a kilogramme is raised through a height of a metre. This is equal to 7.28 foot-pounds, and a foot-pound equals .1383 of a kilogrammetre. If a force equal to the weight of one pound act through a distance of one foot, the work done is one "foot-pound." The

latter is the English unit of work. Work must not be confounded with power, which is the ratio of work to the time during which it is effected. In electricity, the term "work" or "electrical energy" is given to the product of a quantity of electricity by a difference of potential. The electrical energy is measured in volt-coulombs or "joules" in practical units. The joule=10⁷ ergs. Industrially, for mechanical work, the unit called "horse-power hour" is used (1 h.p.=33,000 foot-pounds of work per minute). For electric work, the "watt-hour," which equals 3600 joules and its multiples, which are the "hektowatt-hour" (1000 w.h) and the "kilowatt-hour" (1000 w.h) are used. In thermic motors (steam, gas, or gasolene) the term "indicated work" is applied to the work actually produced in the cylinder by the expansion of the steam or gas during a certain time. This quantity is obtained by determining the mean pressure in the cylinder and as a function of the piston surface, of its stroke, and of its velocity. The "effective work" at the fly-wheel of the engine is the product of the indicated work by the organic efficiency of the motor.

Working-beam.—See Beam. Walking.

Working Load.—The load to which a machine is subjected in ordinary use.

Workman, R. A.—Woodward, Okla. (Waltham).

Worm.—A shaft provided with a screw-thread, and which, through its rotation, revolves a worm-wheel.

Worm-gear.—See Gear. Worm.

Worm-wheel.—See Gear. Worm.

Worth & Bowen.—Rushville. Ind. (National).

Worth Motor Car Mfg. Co.—219 Upper 1st St., Evansville, Ind. Mfrs. gasolene commercial automobiles.

Wortham, W. F.—Waco, Tex. (Maxwell).

Worthing Automobile Co., G. W.—31 W. 2nd St., Fond-du-Lac, Wis. (Jackson, Pope-Waverley).

Worthington, James.—Asst. Designer Haynes Automobile Co., Main St., Kokomo, Ind.

Wray Pump and Register Co.—191-93 Mill St., Rochester, N. Y. Mfrs. pressure gauges, tire pumps.

Wrench.—A tool for turning nuts, bolts, pipe, or the like, and consisting of a lever with jaws, lugs or a socket adapted to fit the head of bolt, nut or other object to be turned. The number of types of these tools is so large that only those most commonly used by the automobilist can be mentioned; viz.: The "monkey" wrench (Fig. 1), which has the advantage of having jaws that can be adjusted to any size nut; the "alligator" or "bulldog" wrench (Fig. 2); the Stillson,"

adjustable pipe wrench (Fig. 3), with narrow jaws for use in confined places, and capable of gripping anything as small as a $\frac{1}{8}$ -inch wire or as large as a $\frac{3}{4}$ -inch pipe; the double-end "S" wrench (Fig. 4),

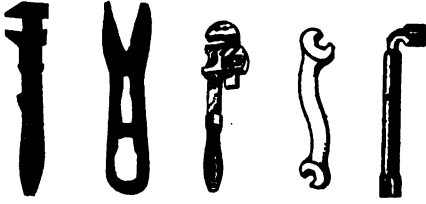


Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5

for general automobile purposes; and the "socket" wrench or "box spanner" (Fig. 5), a tubular piece of metal shaped at the ends (one of which is sometimes offset as in the figure) to fit a standard nut, and provided with apertures to receive a cross-pin for giving a better grip for the hand.

Wrench, Tap.—See Tap-wrench.

Wridgway, Charles George.—Vice-Pres. and Gen. Mgr. Peerless Motor Car Co. of New York. B. London, England, Feb. 15, 1873. Ed. grammar schools. Director Peerless Motor Car Co. of New York, Motor Car Service Co. of New York, Peerless Garage, Brooklyn, N. Y. Mem. clubs: A. C. A., N. Y. Motor, N. Y. Athletic, Columbia Yacht. Res. 463 W. 140th St.; office, 220-24 W. 41st St., New York City. In the trade since 1896. Used first car 1896.

Wright & West.—Stockton, Cal. (Maxwell).

Wright, A. E., Jr.—Main St., Buena Vista, Colo. (Reo, Premier). Est. mercantile, 1892; automobiles, 1906. A. E. Wright, Jr., sole owner.

Wright, B. A.—Newport, Ky. (Haynes).

Wright, C. H.—Boulder, Colo. (Holsman).

Wright, Christopher.—Pres. Wright Cooler & Hood Mfg. Co., Chicago, Ill.

Wright Co., H. B.—Newark, Del. (Rambler).

Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill. Mfrs. automobile coolers, radiators, hoods, mudguards, gasoline tanks, metal dashes, garage pans, engine boots. Cap. \$10,000. Est. December, 1905. Christopher Wright, Pres.; H. A. Wright, Sec.; R. E. Wright, Treas.

Wright, Dell.—Sales Mgr. Broadway Automobile Co., Broadway and Madison St., Seattle, Wash.

Wright, Elsom, Jr.—141 N. Blvd., Oak Park, Ill. Garage.

Wright, Frank.—Appleton, Wis. (Pope-Waverley).

Wright, Geo. H.—Greenfield, Mass. Morgan and Wright tires.

Wright, Geo. M.—Somers, N. Y. (Aerocar).

Wright, H. A.—Sec. Wright Cooler & Hood Mfg. Co., Chicago, Ill.

Wright, H. E.—11 S. Main St., W. Bethlehem, Pa. Garage.

Wright, H. M.—Sec. and Treas. Flatrock Auto Co., Flatrock, Ind.

Wright, John Dunbar.—Artist. B. New York City, May 3, 1862. Ed. Charliers Institute. Mem. clubs: Racquet, Brook, N. Y. Yacht, Larchmont, Lambs, A. C. A., Camp Fire, Camera, Salamagundie, Geog. Society. Res. 41 E. 51st St.; studio 53 W. 33rd St., New York City.

Wright, L. W.—South Norwalk, Conn. Garage.

Wright Motor Co.—48 S. Division St., Buffalo, N. Y. Mfrs. gasoline automobile and gasoline marine motors.

Wright, Northam.—Chesterbrook, Conn. (Rambler).

Wright, R. E.—Treas. Wright Cooler & Hood Mfg. Co., Chicago, Ill.

Wright, R. G.—Supt. Autocar Equipment Co., 77-79 Edward St., Buffalo, N. Y.

Wright, W. E.—Vice-Pres. and Sales Mgr. Knox Automobile Co., Springfield, Mass.

Wright, W. G.—Paulsboro, N. J. Mfr. motorboats.

Wrist-pin.—A straight cylindrical piece of steel, called also a piston-pin, fastened into the piston, and on which the small end of the connecting-rod turns. In a steam engine, a cross-head pin as distinguished from a crank-pin.

Writer, Geo. S.—Nyack, N. Y. (Ford).

Wrought Iron.—See Iron, Wrought.

Wulf, W. J.—San Juan, Porto Rico. (Thomas Flyer).

Wüppermann, Wilhelm.—Hagen, Germany. Mfr. chain.

Wurth, Louis J.—26 William St., Morristown, N. J. (Mitchell).

Wyckoff, Church & Partridge.—Broadway and 56th St., New York City. Est. 1900. Cap. \$500,000. (Stearns.) Clarence F. Wyckoff, Pres.; Alfred W. Church, Sec.; E. S. Partridge, Vice-Pres.; George Mortenson, Mgr. repair and storage depts.; R. H. Weaver, Mgr. accessory dept.; E. B. Ayers, Supt. repair dept. Garage, 300 cars; repairing.

Wyckoff, Clarence Frederick.—Pres. Wyckoff, Church & Partridge. B. Ithaca, N. Y., Jan. 2, 1876. Ed. Brooklyn Polytechnic, Cornell, Berlin Universities. Di-

rector Wyckoff, Church & Partridge, Wyckoff Adv. Co., Booths Hyomer Co. Mem. clubs: A. C. A., N. Y. Motor, N. Y. Athletic. Cornell, Chi Psi Fraternity, Triton, Stony Island, Ithaca Town and Country. Res. 65 Central Park West; office 1743 Broadway, New York City. In the trade since 1900. Used first car 1898.

Wyckoff Lumber & Mfg. Co.—Ithaca, N. Y. Mfrs. portable houses. •

Wyeth Auto & Supply Co.—216-218 N. 2nd St., St. Joseph, Mo. (Locomobile, Buick, Cadillac, Haynes, Stevens-Duryea).

Wyeth, C. E.—47 W. Main St., Newark, O. Garage.

Wyldo & McInnis.—Belvidere, Ill. Garage.

Wyman & Gordon.—30 Bradley St., Worcester, Mass. Mfrs. connecting rods, crank shafts, drop forgings.

Wynkoop, Theo.—406 Main St., Catskill, N. Y. Garage.

Wyoming Valley Motor Car Co.—35 N. Washington St., Wilkesbarre, Pa. (Buick, Locomobile, Cadillac, Pope-Waverley).

Wyss et Cie.—Seloncourt, Doubs, France. Mfrs. clutches.

X

X.—Symbol for "reactance."
Xander Machine & Supply Co.—926-930 Bingham St., Reading, Pa. J. G. Xander, Prop. Machine shop.

Xardell Co., C. A.—Utica, N. Y. Mfrs. carbureters, gasoline automobile motors.
X-Spring.—See Spring, X.
Xylonite.—A form of "celluloid," q. v.

Y

Yacht, Ferry.—A type of motor-boat, 50 to 80 feet in length, designed to carry business men to and fro between maritime cities and their distant summer residences.

Yacht, Launch & Engine Co.—Philadelphia, Pa. Mfrs. motor boats.

Yacht, Le.—Pub. at 55 rue de Chateaudun, Paris, France.

Yachting.—Pub. monthly by Yachting Pub. Co., 20 Vesey St., New York City. Oswald Garrison Villard, Pres.; Harold G. Villard, Vice-Pres.; Robert M. McBride, Sec. and Treas.

Yachting Gazette.—Pub. at 41 rue Meyerbeer, Paris, France.

Yakima Auto Co.—Yakima, Wash. (Monarch).

Yakima Garage & Auto Co.—N. Yakima, Wash. (Cameron).

Yale Automobile Club.—P. O. box 64, Yale Station, New Haven, Conn. Object: To promote interest and knowledge in automobiles. Org. April 10, 1907. Charter members: C. S. Bragg, W. J. Morden, W. Johnson, G. H. Townsend, R. B. English, W. B. Webb, H. J. Chisolms, G. Haas, L. C. Phipps. Officers: G. H. Townsend, Pres.; L. C. Phipps, Vice-Pres.; W. J. Morden, Sec.; E. H. Butler, Jr., Treas. Chairman of committees: C. S. Bragg, chairman Committee of Events; R. B. English, chairman motor cycle department. Promoted races April 27, 1907; May 25, 1907; at Branford Driving Park.

Yale, Wm. A.—Fitchburg, Mass. (Waltham).

Yankee Muffler Co., The.—Utica, N. Y. Mfrs. mufflers.

Yates, Harry.—Treas. Babcock Electric Carriage Co., 226-242 W. Utica St., Buffalo, N. Y.

Yates, Russel P.—887 Main St., Buffalo, N. Y. Supplies.

Yberty et Merigoux.—Royat Puy-de-Dome, France. Mfrs. solid tires.

Yerkes, Geo. B.—Pres. Brush Runabout Co., 14-16 Baltimore Ave. W., Detroit, Mich.

Yocom Co., A. H.—Reading, Pa. Mfrs. gasoline automobile motors.

Yoke.—A transverse bar of wood or metal used as a substitute for the tiller, crossing the head of a boat's rudder, and having a line attached to each extremity for steering. (2) Another name for bridge and bolt, q. v. (3) A clamp or clip for holding a part or parts of a mechanism in place.

Yoke-end.—See Clevis.

Yoke-line.—One of a pair of ropes attached to the ends of a yoke on a rudder-head.

Yonkers Automobile Club.—Yonkers, N. Y. F. P. Fuller, Sec.

Yonkers Auto Station.—71 S. Broadway, Yonkers, N. Y. (Locomobile, Maxwell). Garage; repairs.

York Auto Garage.—S. S. Blk., York Village, Me. (Reo, Premier).

York County Garage.—Mechanic St., Sanford, Me. (Stevens-Duryea, Stanley, Cadillac, Buick). Est. 1905. Cap. \$2,000. Chas. S. Holmes, Pres., Treas. and Gen. Mgr. Garage, 20 cars. Repairing.

York Electric & Machine Co.—30-34 N. Pennsylvania St., York, Pa. Mfrs. wrenches. Cap. \$10,000. Established

March 26, 1903. John E. Graybill, Pres. and Mgr.; Paul McJunkin, Vice-Pres.; H. G. Wiest, Sec. Treas. and Supt.

York Motor Car Co.—240 N. George St., York, Pa. Makers of the Pullman car; first marketed in 1905. Five models made since. Cap. \$100,000. S. E. Bailey, Pres.; Thos. C. O'Connor, Vice-Pres.; Oscar C. Stevenson, Sec.; J. A. Kline, Treas., Gen. Mgr. and Designer; Chas. Swartz, Supt.; H. R. Averill, Sales Mgr. Agents and dealers: Cimiotti Bros., 1843 Broadway, New York City; D. B. Hoffer & Sons, 126 S. 10th St., Reading, Pa.; Hooker, Stanley A., 216 E. 3d St., Cincinnati, O.; Keystone Motor Car Co., 1019 Market St., Harrisburg, Pa.; Lewistown Motor Car Co., Lewistown, Pa.; Frederick E. Randall Co., 245 Columbus Ave., Boston, Mass.; Pullman Auto Agency, H. A. Stone, Mgr., Los Angeles, Cal.; Thomas & Tolman Auto Co., 1828 L St., N. W., Washington, D. C.; Frank O. Renstrom Co., 424 Stanyan St., San Francisco and Oakland, Cal.; Shaffer Mfg. Co., 428 N. Calvert St., Baltimore, Md.; Snyder Auto Cycle Co., York, Pa.; State Automobile Co., Mignonette and Randolph Sts., Pittsburg, Pa.; L. E. French, 205 N. Broad St., Philadelphia, Pa.; Sullivan, J. P., Mgr. Monte Cristo Garage, New London, Conn.; Star Motor Car Co., 226 Halsey St., Newark, N. J.

York, Roy F.—Vice-Pres., Sales Mgr. and Adv. Mgr. F. B. Stearns Co., Euclid and Lakeview Aves., Cleveland, O.

Yorkville Auto Renting Co.—64 W. 63rd St., New York City. Rental service.

Yorkville Auto Station.—285 E. 88th St., New York City. Garage.

Yorkville Central Garage, Inc.—205-9 E. 86th St., New York City. Garage.

York Wagon & Gear Co.—York, Pa. Mfrs. wood and metallic bodies.

Yorton, J. H.—413 S. State St., Syracuse, N. Y. Garage.

Yost & Oester.—Illinois St., Mendota, Ill. (Jackson).

Youlden, Geo. A.—Ware, Mass. Garage.

Youmans, John.—251 S. Main St., Watertbury, Conn. (Mitchell, National).

Young, A. A.—Vice-Pres. Von Hamm Young Co., King and Bishop Sts., Honolulu, Hawaiian Is.

Young, Alex.—Pres. Von Hamm Young Co., King and Bishop Sts., Honolulu, Hawaiian Is.

Young Carriage Co., Wm.—4524 Delmar Ave., St. Louis, Mo. Mfrs. wood and metallic bodies.

Young, Geo. A.—51 Coyle St., Woodford, Me. Garage.

Young, Geo. H.—814 Hepburn Ave., Williamsport, Pa. (Baker).

Young, L. A.—Mgr. trimming and cushion dept. Ventilated Cushion & Spring Co., Jackson, Mich.

Young, M.—Orange St., Riverside, Cal. (Ford).

Y. M. C. A.—West side branch, 318 W. 57th St., New York City. Instruction automobile and motor boat engineering.

Y. M. C. A.—Bedford branch, Brooklyn, N. Y. Instruction automobile engineering.

Young, Orlando W.—180 Freylinghuyssen Ave., Newark, N. J. Mfr. anti-freezing solutions, tire cement, grease, oil, metal polishes, auto body soap, repair kits.

Youngs & Co.—249 Grand St., Newburgh, N. Y. (Autocar).

Young's Auto Garage.—Long Branch, N. J. Garage.

Youngs, H. M.—Sag Harbor, N. Y. Garage.

Youngstown Automobile Club.—Geo. L. Fordyce, Sec., Youngstown, O.

Youngstown Iron, Steel & Tube Co.—Youngstown, O. Mfrs. sheet iron and steel.

Youngstown Sheet & Tube Co.—Youngstown, O. Mfrs. wrought iron and steel pipe.

Young, Thos. G.—707 Pacific Ave., Tacoma, Wash. (Rambler).

Young, W. J.—Treas. and Gen. Mgr. Essex Engine Co., 416 Union St., Lynn, Mass.

Youse, Ed. S.—46 N. 5th St., Reading, Pa. (Reo, Rambler, Premier). Est. 1900. Garage, 120-122 Madison Ave., 60 cars. Repairing and electric charging. Dealer and jobber automobile supplies. Mfr. air couplings, timers, drop brakes.

Yowell, Jos. E.—Nashville, Tenn. (Moon).

Yule, Geo. A.—Pres. Badger Brass Mfg. Co., 11th Ave., 36th to 37th Sts., New York City. and Kenosha, Wis.

Z

Zn.—Symbol for "Zinc."
Zacharias, C. R.—Eagle Hall, Main St., cor. Sewall Ave., Asbury Park, N. J. Est. 1898. Garage, 150 cars. Repairing.
Zavala, Adolfo, S. en C.—Calle 55 esquina de 64, Merida, Yucatan, Mex. Garage.
Zearian Auto Co., J. A.—Davenport, Ia. (Maxwell).
Zédeco Société des Accumulateurs.—97 rue Saint-Lazare, Paris, France. Mfrs. storage batteries.
Zeigler, Roy.—Muncie, Ind. (Haynes).
Zena, Societa Anonima di Automobili.—Via XX Settembre, Genoa, Italy. Mfrs. gasoline automobiles (Zena cars).
Zenith Motor Engineering Co.—101 Stroud Green Rd., Finsbury Park, London, England. Mfrs. Zenith motorcycles, tri-cars and guads.
Zerbel & Mulkern.—225 Grand Ave., Milwaukee, Wis. Garage.
Zero Valve & Brass Mfg. Co.—419 Chicago St., Buffalo, N. Y. Mfrs. brass castings.
Zierold, Arno.—Crimmitschau, Germany. Mfr. tire pumps.
Zimalium.—An alloy formed by adding to aluminum small quantities of magnesium and zinc.
Zimbrich, A. M.—45-49 South Ave., Rochester, N. Y. (Stoddard-Dayton, Maxwell, Marmon, Dolson).
Zim-Kel Motor Car Co.—320 N. Broad St., Philadelphia, Pa. (Pungs-Finch).
Zimmerman et Cie.—22 ter, Blvd. Bourdon, Neuilly-sur-Seine, France. Mfrs. bodies.
Zimmerman & Sons, F. F.—Waupun, Wis. Mfrs. wood and metallic bodies.
Zimmerman, Axel.—Sec. Duluth Gas Engine Works, Vine St. and Minnesota Ave., Duluth, Minn.

Zimmerman, Chas.—Gasolene engineer, Neustadt Auto & Supply Co., 3948-50 Olive St., St. Louis, Mo.

Zimmerman, Dr.—Ludwigshafen-am-Rhein, Germany. Mfr. radiators.

Zimmerman Hardware Co.—Wapakoneta, O. (Richmond).

Zimmerman, Smith Co.—N. Towanda, N. Y. Garage.

Zinc.—A bluish-white metal, having a lamellar, crystalline structure, and, under ordinary circumstances, brittle, although ductile and malleable between 212° and 300° F. It is used in making "galvanized" iron and many important alloys, such as brass, bronze and German silver, and is employed likewise as the negative pole in a number of important cells.

Zinc-pole.—The negative pole of a voltaic cell.

Zinnel, Frank.—Savana, Ill. (Moline, Oldsmobile).

Zornow.—Altona, Germany. Mfrs. wooden wheels.

Zorn-Strauss Co.—Louisville, Ky. (Stevens-Duryea, Franklin).

Zücker, Ph.—17 Clarastrasse, Bale, Switzerland. Mfr. motorcycles.

Zuntini, Romeo.—Gaiba, Italy. Mfr. motorcycles.

Züst, Roberto.—via Borgogne, Milan, Italy. Mfr. automobile motors, gasoline automobiles (Züst cars).

Zylonite.—The same as Xylonite, q. v.

Zincing Copper.—To copper and brass articles may be given a very adhesive and brilliant coating of zinc by first cleaning them with hydrochloric acid (spirits of salt) and then immersing them in a boiling solution of sal ammoniac containing an excess of zinc granules or turnings.

ABBREVIATIONS:

B.—Born. Cap.—Capital. Ed.—Education, educated. Est.—Established. Inc.—Incorporated. Ltd.—Limited.

Clubs and Associations: A. A. A.—American Automobile Association. A. C.—Automobile Club. A. C. A.—Automobile Club of America. A. C. F.—Automobile Club of France. A. G. A.—Association Generale Automobile. A. I. E. E.—American Institute of Electrical Engineers. A. L. A. M.—Association of Licensed Automobile Manufacturers. A. M. C. M. A.—American Motor Car Manufacturers Association. A. M. L.—American Motor League. F. A. I.—Federation Aeronautique Internationale. M. & A. M.—Motor and Accessories Manufacturers. N. A. A. M.—National Association of Automobile Manufacturers. T. C. F.—Touring Club of France.

The car or cars handled by trade concerns are placed in parenthesis after the name and address of the latter.

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Algeria,	Ireland,
Argentine Republic,	Italy,
Austria,	Mexico,
Australia,	New South Wales,
Belgium,	New Zealand,
Bolivia,	Roumania,
Canada,	Russia,
Cuba,	Scotland,
Denmark,	South Wales,
England,	Spain,
France,	Sweden,
Germany,	Switzerland,
Holland,	United States of America,

FOURTH SECTION (Blue)

Geographical Trade Directory, arranged by countries, states and towns, comprising:

Algeria,	Ireland,
Argentine Republic,	Italy,
Austria,	Mexico,
Australia,	New South Wales,
Belgium,	New Zealand,
Bolivia,	Roumania,
Canada,	Russia,
Cuba,	Scotland,
Denmark,	South Wales,
England,	Spain,
France,	Sweden,
Germany,	Switzerland,
Holland,	United States of America,

Club, Contest and Touring Section

Calendar of Automobile Events, 1908.

Club Members.

Aero Club of America.
Albany (N. Y.) Automobile Club.
Automobile Club of America.
Automobile Club of Bridgeport, Conn.
Automobile Club of Buffalo, N. Y.
Automobile Club of Cincinnati, O.
Automobile Club of Davenport, Ia.
Automobile Club of Philadelphia, Pa.
Automobile Club of Pittsburgh, Pa.
Automobile Club of Washington, D. C.
Atlantic City (N. J.) Automobile Club.
Auburn (N. Y.) Automobile Club.
Beloit (Wis.) Automobile Club.
Binghamton (N. Y.) Automobile Club.
Chicago (Ill.) Automobile Club.
Cleveland (O.) Automobile Club.
Florida East Coast Automobile Association.
Geneva (N. Y.) Automobile Club.
Janesville (Wis.) Automobile Club.
Milwaukee (Wis.) Automobile Club.
Motor Club of Harrisburg, Pa.
New Jersey Automobile and Motor Club.
New York Automobile Club.
Oshkosh (Wis.) Automobile Club.
Portage (Wis.) Automobile Club.
Rochester (N. Y.) Automobile Club.
Springfield (O.) Automobile Club.
Springfield (Mass.) Automobile Club.
Whitewater (Wis.) Automobile Club.
Wilkes-Barre (Pa.) Automobile Club.

Automobile Law Section.

Part I.—Explanatory.

Part II.—Digest of automobile laws of United States and foreign countries.

Touring Information and Customs Regulations.

Speed Records.

Competitions, American; races (track, road and beach), tours, hill-climbs.

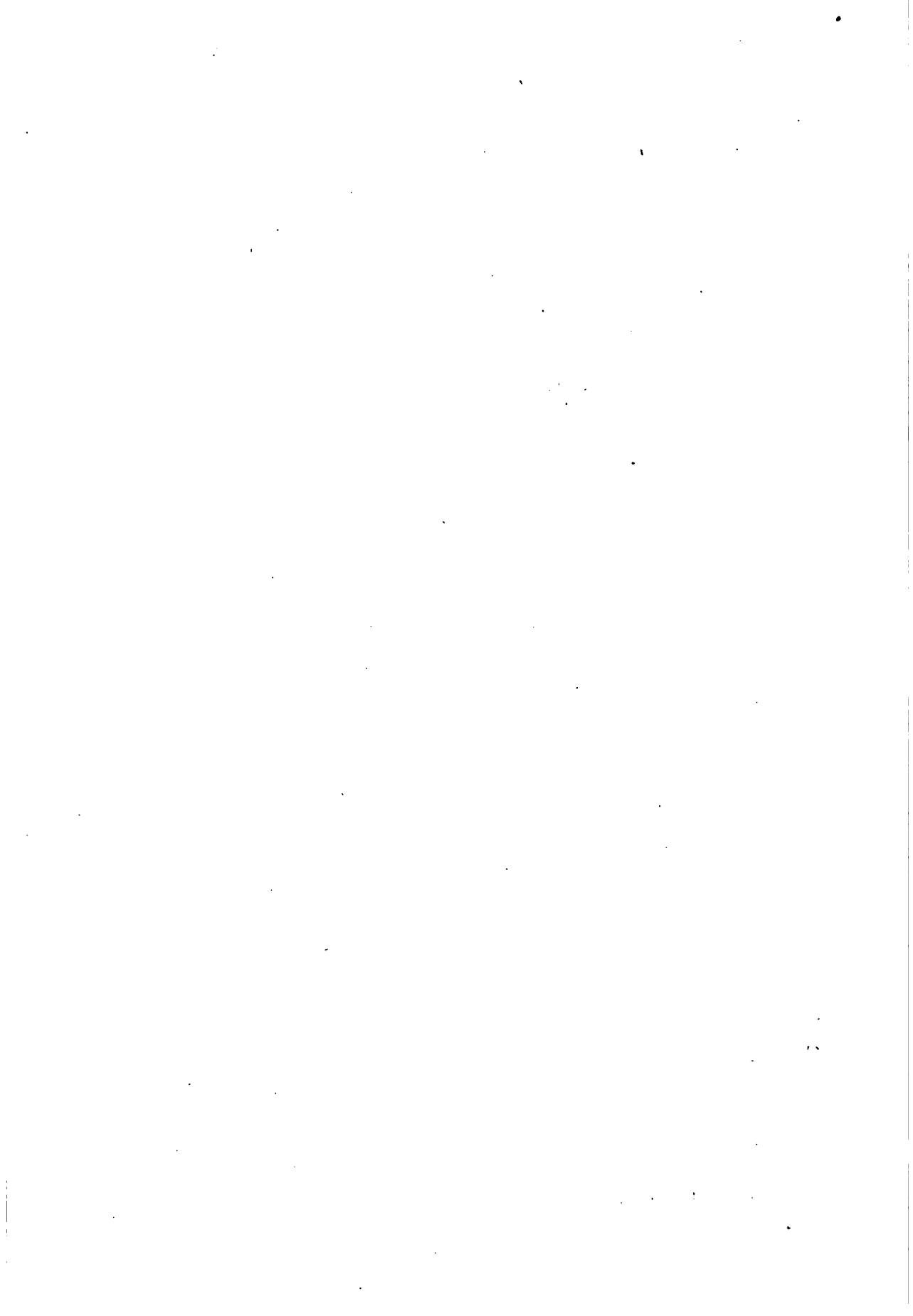
Competitions, Foreign.

Tables of 1908 cars, American and European.

Body Styles.

Tables of Horsepower.

Automobile Clubs.



Calendar of Automobile Events, 1908

JANUARY.

- January 1-8.—Annual Motor Boat Show at Chicago, under direction of National Association of Engine and Boat Manufacturers.
- January 4-11.—Annual Automobile Show at Dublin, Ireland.
- January 14-18.—Hartford (Conn.) Automobile Dealers' Association's Automobile Show at the Foot Guard Hall.
- January 18-February 2.—Fifth International Automobile Exposition, Palace of Fine Arts, Valentino Park, Turin, Italy, under auspices of Automobile Club of Turin.
- January 25-February 1.—Annual Show of National Association of Engine and Boat Manufacturers, Boston, at Mechanics' Building, Chester I. Campbell, manager, 5 Park Square, Boston.
- January 26.—Criterion of small cars and cup of the exposition of motorcycles, organized by Automobile Club of Turin and Motor Club of Italy.

FEBRUARY.

- February...—Winter trophy contest from Stockholm to Gothenburg, Automobile Club of Sweden.
- February 1-8.—Automobile Show, State Armory, Providence, R. I.
- February 3-8.—Automobile Show in Convention Hall, Kansas City, Mo.
- February 3-8.—Buffalo's First Annual Power Boat and Sportsmen's Show, at Convention Hall, under direction of Buffalo Launch Club.
- February 10-15.—Seventh Annual Automobile Show at the Light Guard Armory, Detroit, Mich.
- February 17-22.—Cleveland Automobile Show under direction of Cleveland Automobile Dealers' Association.
- February 20-March 7.—The Fourteenth Annual Motor Boat and Sportsman's Show, Madison Square Garden, New York City.
- February 21.—Automobile Show at Electric Park, Newark, N. J., under joint auspices of the New Jersey Automobile and Motor Club and the New Jersey Automobile Trade Association.
- February 24-29.—Automobile Show and Gymkhana, Bombay, India, under the auspices of the Motor Union of Western India.

MARCH.

- March 2.—Automobile racing at Ormond-Daytona, Florida, under management of Automobile Club of America.

March 7-14.—Sixth Annual Boston Automobile Show in Mechanics' Building, under direction of Boston Automobile Dealers' Association.

March 9-14.—Sixth Annual Automobile Show, Buffalo, N. Y., under the auspices of the Automobile Club of Buffalo. Dai H. Lewis, manager, 760 Main Street, Buffalo, N. Y.

March 16.—The Fourth Annual Motor Boat Carnival at Palm Beach, Fla.

March 21-28.—Annual Cordingly Show, London, England.

March 21-28.—Automobile Show at St. Lawrence Rink, Toronto, Canada.

March 22.—Automobile Week, under direction of Nice Automobile Club.

March 24.—Tourists' Contest in connection with Nice Carnival.

March 25.—Contest of elegance at Monte Carlo.

March 26-April 14.—Commercial Vehicle Show, Olympia, London.

March 27.—First annual Motor Boat Show, at Detroit, Mich., in Light Guard Armory.

March 29.—Kilometer race at Nice.

March 31.—Gymkhana events, organized by the Automobile Club of Nice.

APRIL.

April...—International Automobile Exhibition, at Vienna, under direction of Austrian Automobile Club.

April 1-13.—Annual Motor Boat Meeting at Monaco, Monte Carlo.

April 4-11.—Third Annual Automobile Show at Montreal, Canada.

April 5-10.—Test for touring cars, Automobile Club of Venice.

April 5-12.—Third Annual Automobile and Sportsmen's Show, Montreal, Canada, Arena.

April 6-11.—Second Annual Show of the Pittsburg (Pa.) Automobile Club.

April 10-15.—Regatta for motor boats, under direction of Nautical Club of Nice.

April 18-20.—Cruise from Nice to Antibes and Villafrance, Nautical Club of Nice.

April 23-May 25.—Heavy Vehicle Trials, under direction of the Automobile Vehicle Club of France.

April 24.—Stock Touring Car Race in Westchester County, N. Y.

April 26.—Race in Lyons, Automobile Club of Rhone.

MAY.

- May 3-10.—Prize contest of the Auto-Cycle Club of France.
 May 6-20.—International Automobile Exhibition, Automobile Club of Moscow, Russia.
 May 7.—Motor car competition in Sicily, Committee of Palermo.
 May 10.—Sicily, Targa Florio, Automobile Club of Italy.
 May 10-20.—Club Tour to Bosnia, Automobile Club of Austria.
 May 17.—Automobile Race in Provence, Automobile Club of Marseilles.
 May 17-24.—International Automobile Exhibition, Budapest, Hungarian Automobile Club.
 May 30.—Hill Climbing Contest at Sport Hill, Easton, Conn., under direction of the Automobile Club of Bridgeport.
 May 31.—Hill Climbing Contest of Montjen, Tourists' Association of Morran.
 May 31.—Automobile speed contest, Automobile Club of Moscow.
 May 31.—Reliability test, Automobile Club of Denmark.

JUNE.

- June ...—Third International Balloon Contest, to start from Berlin, Germany.
 June 1-18.—Reliability Trials, Royal Automobile Club of Great Britain.
 June 9-17.—Tourist Trials, for Prince Henry's Cup, Automobile Club of Germany.
 June 14.—Susa-Mont-Cenis Hill Climbing competition for voiturettes, "Stampa Sportiva."
 June 15-18.—Commercial Motor Vehicle trials, Automobile Club of Sarth.
 June 15-19.—Reliability Trials, under auspices of Scottish Automobile Club.
 June 18-21.—Austrian Voiturette Trials, Automobile Club of Austria.
 June 21.—Kilometre Race, Automobile Club of Rhone.
 June 22-29.—Kiel Motor Boat Race, Kiel Automobile Club.
 June 29.—Contest for Rochet-Schneider Cup, Automobile Club of Austria.

JULY.

- July ...—Grand Prix Automobile Race on Dieppe Circuit, under direction of Automobile Club of France. (Exact date to be announced.)
 July 13-17.—International Race Week, Automobile Club of Ostende, Ostende, Belgium.
 July 14.—Paris to London, Aerial Race.
 July 17-20.—Franchomme Cup Contest, Automobile Club of the North.
 July 20-30.—Ardennes Circuit Races and Coupe de Liedederke, Automobile Club of Belgium.

AUGUST.

- August 1-8.—Coupe de la Presse, by Automobile Club of France.
 August 1-10.—Motor Boat Week of Ostende, Ostende Yacht Club.
 August 9.—Evrux Cup Contest, "Les Sports."
 August 9-16.—Motor Boat Race from Paris to the sea.
 August 9-16.—Menier Cup Contest, Syndical Chamber of Automobile Navigation.
 August 20.—Automobile Trials and Motor Boat Regattas at Saint Sebastien.
 August 23.—Mont Pilat Hill Climb, Automobile Club of Rhone.
 August 27.—Meeting of the Salon, Automobile Club of the Salon.
 August 29-30.—Mont Ventoux Hill Climb, Automobile Club of Vancluse.

SEPTEMBER.

- September 1-15.—Voiturette Cup Contest, "L'Auto."
 September 6.—Coppa Florio, Automobile Club of Bologna and Automobile Club of Italy.
 September 17-20.—Dutch Touring Car Contest, Automobile Club of Holland.
 September 20.—Automobile Contest for Cup offered by "L'Auto."
 September 20.—Semmering Hill Climb.
 September 27.—Chateau-Thierry Hill Climb.

OCTOBER.

- October 2.—Speed Trials of Royal Automobile Club, in Isle of Man.
 October 2.—Gaillon Hill Climb.

Club Members

*Aero Club of America.

Adams, Dr. Calvin Thayer; Adams, Louis R.; Allen, W. C.; Alexander, Patrick Y.; Anderson, A. A.; Antisell, Frank L.; Astor, Col. John Jacob.

Bain, George Grantham; Baker, George F., Jr.; Baldwin, Thomas S.; Barker, F. W.; Barnard, A. W.; Batchelder, A. G.; Beach, S. Y.; Bee, W. G.; Belden, Alvin J.; Belding, M. M., Jr.; Bell, Alexander Graham; Belmont, O. H. P.; Berliner, Emile; Birdsall, Edward T.; Bishop, Bennett; Bishop, David Wolfe; Bishop, Cortlandt Field; Blair, D. W.; Blondin, Joseph A.; Borglum, Gutzon L. M.; Borne, John E.; Bovee, Dr. J. Wesley; Bowman, J. W.; Boyce, Edward C.; Brady, Curtis P.; Braine, Daniel L.; Braine, L. F.; Brandreth, John B.; Breese, James L.; Breese, Sydney S.; Brill, Samuel; Bronson, E. B.; Brooks, Emerson; Brown, Geo. McKesson; Brown, Harold H.; Budlong, Milton J.; Bull, Charles C.; Bumbaugh, G. L.; Burrige, Lee S.; Butler, George P.; Butler, S. M.; Butler, William H.; Buzby, Winslow E.

Carroll, John F.; Chadeayne, William C.; Chamberlin, George F.; Chandler, Alfred N.; Chandler, Capt. Charles de F., U.S.A.; Channing, J. Parke; Chanute, Octave; Chapman, Melville D.; Chatain, Henri G.; Churchward, Alexander; Clark, Charles H., Jr.; Clarke, Thomas B.; Conklin, Roland R.; Cordley, Frank R.; Cravens, George W.; Cuntz, Herman F.

Dane, Chester L.; Davis, S. T., Jr.; Davison, E. Mora; Day, George H.; De Ferri de Vicenza, Count; Deming, Paul H.; Dey, Harry E.; Dienstbach, Carl; Dodge, Philip T.; Dressler, Chas. E.; Durant, Edward; Dyer, Leonard H.

Edgar, Newbold Le Roy; Edwards, Charles Jerome; Elverson, James H.; Eddy, Jesse Lee.

Fabbri, Ernesto G.; Farrington, George E.; Fisher, Carl G.; Fitch, E. H.; Flagler, Amasa Plummer; Fleischmann, Max C.; Fliess, Robert A.; Flint, Chas. R.; Fox, Lyttleton; Furber, Percy N.

Gallatin, A. E.; Gallatin, R. Horace; Gallaher, Edward B.; Gallien, A. E.; Gates, Charles G.; Gettinger, William; Gillespie, G. Curtis; Gilman, Edward R.; Glidden, Charles J.; Gratz, Henry S.; Graves, Robert; Greene, W. C.; Grosvenor, Gilbert H.

Haan, R. M.; Hall, William A.; Hall, William H.; Hamilton, J. McMillan; Hammer, William J.; Hawley, Alan R.;

Aero Club of America (Continued)

Hawley, William; Hedge, Capt. Homer W.; Herring, A. M.; Hewitt, Peter Cooper; Hilles, W. S.; Hoadley, Joseph H.; Honan, Dr. William Francis; Hop-pin, Francis S.; Hutton, Geo. B.

Janney, G. Mason; Jones, Charles Oliver; Jones, Ernest La Rue; Juilliard, Frederick A.

Keech, Frank B.; Keil, W. M.; Kelsey, C. W.; Kennedy, William P.; Keresey, John T.; Kimball, Wilbur R.; Kirkner, George M.; Knabenshue, A. Roy; Knoblauch, Charles E.; Knox, Charles B.

Lahm, Frank S.; Lake, Edmund F.; Lake, J. Christopher; Lansden, John M., Jr.; Laurance, Charles L.; Leiter, Joseph; Levee, Charles; Levy, Arthur B.; Lewis, Harry; Lorillard, Pierre, Jr.; Lord, Fred-Harry; Lord, Frederic W.; Lorillard, Pierre, Jr.; Loring, Joseph H.; Lovelace, Iow, Israel.

Magnin, A. de; Magor, Basil; Mallery, Winslow; Manly, Charles M.; Martin, Truman J.; Massenat, A.; Maxim, Hiram Percy; McCoy, J. C.; Megargle, Percy F.; Meldrum, Herbert A.; Merrill, Albert A.; Metzger, William E.; Miller, Charles E.; Miller, Maj. C. J. S.; Mills, W. McMaster; Minahan, Luke J.; Montgomery, George R.; Morrell, Robert Lee; Morris, Dave Hennen; Mortimer, Richard; Moses, Raphael J.; Mott, S. D.; Moulton, Arthur J.; Munn, Charles A.; Munsey, Frank A.; Myers, Carl E.

Nebolsine, Commander A.; Niles, Robert L.; Niles, W. W.

Ocuppaugh, Charles Herbert; O'Neill, Florence; O'Rourke, John F.; Osbourne, Lloyd.

Page, Carl H.; Parker, Orrel A.; Parsons, Hon. Herbert; Partridge, E. S.; Phipps, Henry; Pickering, Prof. W. H.; Pierce, Norman M.; Pinard, Cazeau; Place, Charles W.; Post, Augustus; Postnikov, F. A.; Powell, Maj. B. Baden; Price, James W.; Pupin, Prof. M. I.; Pyne, Percy R., 2d.

Reeves, Mark W.; Reid, Stuart; Riker, A. L.; Risley, George H.; Robbins, Harry Pelham; Ronalds, Pierre Lorillard; Rooney, John Justin; Rotch, A. Lawrence.

Sampson, Alden, 2d; Santos-Dumont, Alberto; Saunders, W. L.; Schanck, George E.; Schleiffahrt, Charles Wimar; Schmitt, Arthur G.; Schwartzschild, Otto P.; Scott, Robert P.; Selfridge, Lieut. T. E.; Seligman, Alfred L.; Seligman, Jef-

Aero Club of America (Continued)

erson; Sellers, Matthew B.; Sewell, Frederic W.; Sewell, W. B.; Sexton, Robert H.; Shattuck, Albert R.; Shaw, John M.; Shields, George O.; Shoemaker, Henry W.; Silverston, A. Rudolph; Smith, Gen. Geo. Moore; Sorchan, Victor; Steinmetz, Charles P.; Stevens, A. Leo; Stuart, J. G.; Sweetland, H. M.

Talbot, Richmond; Tangemann, George P.; Taylor, Cecil Hamelin; Taylor, Henry R.; Taylor, Samuel Walter; Thomas, Dr. Julian P.; Thomas, O. F.; Thompson, Jefferson De Mont; Thorley, Charles; Todd, Prof. David; Towle, Charles S.; Tracy, Joseph; Trevor, John B.; Twombly, W. Irving.

Valentine, Samuel H.; Vanderbilt, William K., Jr.; Van Ferls, C. P. A.; Veeder, C. H.

Walsh, Charles; Warren, Lloyd; Washburn, Thomas G.; Waters, G. Jason; Watson, Gen. Thomas L.; Webb, G. Creighton; Weed, John A.; Weinberg, Gustave; Weir, F. E.; Welch, A. M.; Werner, Oscar; White, Rollin Henry; Whitehouse, William F.; Whiting, A. H.; Whitman, A. A.; Whitman, R. B.; Whitney, Harry Payne; Williams, Winslow Tracy; Williams, J. Newton; Willoughby, Hugh Laussat; Wood, Henry A. Wise; Woodworth, H. S.; Wright, J. Dunbar; Wright, Orville; Wright, Wilbur.

Zahm, Albert Francis.

ALBANY (N. Y.) AUTOMOBILE CLUB.

Abrams, Dr. H. C.; Anderson, Alex; Armstrong, Miss Edith; Arnold, B. W.

Bailey, Edward G.; Bailey, J. H.; Baker, C. K.; Ball, H. Dayton; Ballentine, C. J.; Barzen, P. J.; Battershall, F. W.; Beattie, Walter J.; Beattie, Wm.; Boland, Charles P.; Booth, Dr. W. H.; Braman, I. G.; Briggs, Thomas T.; Bronk, Henry; Buckley, W. H.; Burdick, B. W.; Burns, J. F.

Cantine, Edward B.; Canton, C. N., Jr.; Clarke, Lloyd; Clute, Fred V.; Connors, Martin; Converse, H. T.; Coonley, Porter S.; Corning, Edwin; Corning, Parker; Coughlin, Joseph P.; Covert, Fred; Cowdery, F. D.; Cox, Dr. E. G.; Cox, Dr. F. J.

Dederick, Archland M.; Denning, Wm. H.; Dietz, C. F.; Dix, John A.; Dolan, Frank P.; Douglas, Thompson; Dunscomb, J. K.

Emery, John W.

Fisk, F. H., Jr.; Fitch, Arthur; Fitzgerald, James C.; Foster, H. S.; Fox, Albert M.; Fry, Harold De Long; Fuller, A. W.

Gavit, E. Palmer; Gilmour, Allan A.;

Albany (N. Y.) Automobile Club (Cont.)

Glynn, Martin H.; Gordon, John E.; Graves, F. B.; Gray, James S.; Green, Harvey S.; Greenleaf, L. S.; Griesau, F. W.; Griswold, Morgan.

Hakes, C. D.; Hallenbeck, W. H.; Hampton, H. J. P.; Happle, Dr. A. H.; Harrington, F. B.; Harris, J.; Hart, John J.; Havens, Morton, Jr.; Hawley, George C.; Heidenrich, John F.; Herrick, Frank C.; Hessberg, Samuel; Hilton, George P.; Howell, F. S.; Hubbard, G. A.; Hun, Dr. H.; Huyck, E. N.; Huyck, F. C., Jr.; Huyck, J. N.

Igo, Wm. M.

Judson, A. L.

Kavanaugh, Charles H.; Kavanaugh, Fred W.; Kavanaugh, George W.; Keefer, David H.; Keeler, W. H.; Kelly, Charles E.

Lansing, Egbert P.; Lansing, G. Y.; Lansing, I. D. F.; Lawson, Joseph A.; Lansing, Lee C.; Leahy, E. W.; Lowenthal, W.; Lucey, James; Lyon, James B.

MacDonald, Dr. W. G.; Mack, John. Mallett, John L.; Martin, Henry T., Jr.; Martin, Howard; Martin, P. E.; Marvin, Selden E.; McClute, Archibald J.; McCormick, J. H.; McCormick, James J.; McConhie, Alonzo; McDowell, Howard G.; McGlynn, John; McKee, H. R.; McKee, R. W.; McNamee, Frank A.; Melius, Ludlow S.; Milbank, Dr. W. E.; Minihan, James C.; Mitchell, James H.; Morton, S. W.; Murphy, Joseph J.

Neuman, Dr. Leo H.; Newcomb, Grant; Newell, John; Nickolson, W. Sidney; Nutter, Harvey.

Obenaus, Wm.; O'Neill, M. F.

Palin, Wilfred C.; Palmer, Walter L.; Parkinton, George; Payne, John E. B.; Peckham, Wm. M.; Peltz, W. L. L.; Pine Warren A.; Pruyn, E. L.; Pruyn, R. C.

Quayle, O. A.; Quayle, R. K.

Randerson, Miss Alice; Randerson, H. J.; Randerson, J. E. H.; Randerson, J. P.; Ransom, C. S.; Ransom, H. N.; Reynolds, W. G.; Robinson, F. G.; Robinson, R. M.; Ryder, M. L.

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MacArthur, C. P.; MacDonald, Moore; Mackwirth, E.; Mack, Norman E.; Maguire, J. W.; Manger, Leo; Manges, Dr. Monroe; Manning, Robert C.; Mansperger, Dr. W. H.; Marcy, Dr. W. H.; Marks, Sanford E.; Martin, Darwin D.; Mason, F. A.; Matthews, Albert S.; Mathews, George B.; Mathewson, Fred S.; May, Henry; McBride, Daniel J.; McBrier, E. M.; McBrier, E. W.; McCormick, U. S.; McCaffrey, Dr. James H.; McCarthy, Edmund D.; McConnell, Archie; McCoy, B. S.; McCullough, Jr., C. H.; McCullough, Dr. John J.; McDonald, Reynold; McElhinny, J. W.; McFarland, John S., M.D.; McGraw, F. S.; McGuire, Dr. E. R.; McIntyre, Ernest W.; McKay, James; McKee, R. J.; McKinnon, L. E.; McLean, R. D.; McLeod, Duncan; McLeod, John; McMichael, Dr. Geo. H.; McNaughton, James; McNaughton, Pliny B.; McNeill, H. R.; McNeil, Peter; McNulty, Jas.; Meadows, T. C.; Meeks, Dalton; Meinell, G. G.; Meinhard, Theo. P.; Meldrum, H. A.; Mengis, Dr. Chas. J.; Messersmith, Albert; Messersmith, Edgar C.; Messersmith, J.; Metcalfe, G. S.; Metzger, Wm. E.; Meyer, C. J.; Meyer, Edward J.; Meyer, Peter H.; Michaels, Henry; Micherdzinski, Jacob; Miles, H. D.; Miller, Chas. E.; Miller, Geo. W.; Miller, Dr. Jacob; Miller, Joseph; Miller, Wm. B.; Mitchell, Geo. A.; Mock, Erie O.; Moffat, W. L.; Moncreiff, W. G.; Monroe, Chas. F.; Mooney, W. J.; Moore, H. G.; Moore, William S.; Moore, Wm. S.; Morgan, W. H.; Morgan, W. J.; Morgan, William P.; Morlock, J. Fred; Morlock, Jos.; Morris, Geo. W.; Morse, E. C.; Moses, S. M.; Mosher, Allen, 2nd.; Moskovics, F. E.; Muench, Geo.; Mugridge, Edward; Murdock, W. L.

Nassal, A. H.; Naylor, Henry M.; Neal, Benjamin E.; Nevin, Chas.; Neu, John; Neupert, Leo J.; Newton, Allen H.; Newton, James; Nickerson, F. A.; Nolan, Frank J.; Nowak, M. J.; Nowak, M. M.; Nowicki, Stan. S.; Nye, Sylvanus P.

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Sackett, H. I.; Sackett, L. J.; Sage, A. G., M.D.; Sahlen, E. C.; Salzman, George S.; Sampson, A. N.; Sanderson, A. J.; Sangster, A. J.; Saperston, J. L.; Saterlee, Richard; Satterfield, J. M.; Sauer, John; Sawin, F. L.; Sayles, Dr. Geo. W.; Scatcherd, John N.; Schaaf, George; Schack, W. G.; Schade, Fred; Schaefer, Fred C.; Schaeffer, Henry; Schellerman, William J.; Schladermundt,

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Wagner, Chas. W.; Wagner, F. J.; Walker, J. H., Jr.; Wall, J. B.; Wall, M. M.; Walker, John K.; Wall, T. H.; Wannenmacher, George; Warner, G. P.; Warren, James D.; Waters, Henry D.; Watson, A. B.; Wattles, G. M.; Weber, Chas.; Weber, Orlando F.; Weed, Walter I.; Weideman, Carl J.; Weidrich, Chas. L.; Weiland, Geo. F.; Weimert, Orson J.; Weisberg, Max; Weld, J. R.; Wells, A. J.; Wells, F. P.; Wells, R. A.; Weman, Klas; Wendt, W. F.; Wettlaufer, Conrad E.; Wetzel, Thos. J.; Weston, Charles; Whaley, Frank R.; Whaley, H. G.; Whalley, James; Whissel, M.; White, Henry G.; White, James L.; White, Seymour P.; White, W. H.; Whitlock, W. G.; Whitmore, Dr. J. E.; Whitney, C. D.; Whitney, E. R.; Whittaker, Stillman G.; Wilcox, H. C.; Williams, Charles Hoyt; Wilson, E. T.; Willert, C. L.; Williamson, W. A.; Williston, Geo.; Wilson, C. M.; Wilson, T. H.; Winch, Frank; Winchester, Walter T.; Winegar, John; Wing, Geo. P.; Winslow, A. F.; Wisner, A. F.; Wolf, John; Wood, Richard L.; Wooley, James G.; Woolverton, G. C.; Wright, A. B.; Wright, A. J.; Wright, Jacob F.; Wright, Parker; Wright, R. G.; Wright, Dr. Thew.

Yates, Harry; Yates, Russell P.; Yeager, Orson E.; Youngman, Chas. R.; Young, Ernest P.; Young, John N.; Young, Peter; Young, Capt. P. P.; Young, Val P.

Zebold, H. J.; Zeiler, George E.; Zeis, Geo. J.; Zeller, Henry C.; Zeller, J. Fred; Zimmer, C. W.; Zimmerman, N. B.; Zwickel, Albert.

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Quillen, B. B.

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Schacht, G. A.; Schmidlapp, C. J.; Schmidt, H. B.; Schneider, Geo. C.; Schoepf, W. Kesley; Schubert, Chas.; Schumacher, E. A.; Schumard, E. C.; Seaman, Geo. C.; Shaefer, H. F.; Shepard, O. F., Jr.; Sherlock, John C.; Silverglade, Meyer; Slack, John; Smith, Leonard S.; Smith, Harold Roe; Smith, H. T.; Smith, Wm. Walker; Stenger, Fred; Stern, Arthur; Stern, Wm.; Strack, T. P.; Streitman, A. F.

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Van Meter, Dr. C. B.

Wampler, E. W.; Warriner, C. L.; Welsh, Geo.; Wendel, Dr. H. C.; Werk, Emile E.; Wiborg, Frank B.; Windisch, Chas. F.; Wolf, Samuel B.; Wright, Benjamin A.

Zuest, Adolph, Sr.; Zuest, Adolph, Jr.

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Killing, Ewald.

Lane, Dick R.

Miller, R. T.; Miller, S. E.;

Oshlund, A. J.

Petersen, W. D.; Price, A. M.

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Bailey, Charles W.; Bailey, Frank E.; Bailey, Joseph T.; Bailey, Walter A.; Baily, Charles W.; Baily, Henry P.; Bain, Jr., Henry; Baker, Dr. George F.; Barney, Charles D.; Bartlett, Dr. Clarence; Baugh, Jr., Edwin P.; Beale, Jr., Horace A.; Bean, Charles H.; Bell, C. Herbert; Bell, Jr., Samuel; Bell, Jr., S.; Bement, Russell; Benson, Alex M.; Benson, Jr., Edwin N.; Bent, Felton; Bent, Stedman; Betz, 3rd, J. Fred; Beyer, Charles C.; Biddle, Lynford; Blabon, Walter D.; Black, J. Frank; Blake, Robert W.; Boggs, John M.; Bower, J. Neafie; Boyd, Fisher L.; Boyd, James; Branson, Dr. Thomas F.; Brazier, H. Bartol; Bremer, Howard B.; Brock, Charles H.; Brock, Horace; Bromley, Joseph H.; Bromley, Jr., Joseph H.; Brooks, Francis M.; Brown, Dr. Charles; Buchanan, John F.; Bullock, J. Maxwell; Bunting, Joseph S.; Burt, Edward W.; Burton, John; Butler, Edgar H.

Caldwell, J. E.; Caner, Harrison K.; Carstairs, Daniel H.; Carstairs, J. Haseltine; Chadbourne, A. H.; Chambers, Francis D.; Chandler, Alfred N.; Chandler, Fred T.; Chandler, Percy M.; Child, Calvin G.; Clark, A. W.; Clark, Jr., C. Howard; Clark, Jr., E. W.; Clark, Herbert L.; Clarke, A. J.; Clarke, James King; Clarke, John S.; Clarke, Louis S.; Clothier, Morris L.; Coleman, B. Dawson; Colket, E. B.; Colton, Jr., S. W.; Converse, John H.; Converse, John W.; Cooke, 3rd, Jay; Cookman, Thomas E.; Council, Dr. Malcolm S.; Cox, Charles E.; Crothers, Stevenson; Crozer, John P.

Dale, Edward C.; Dailey, H. Allen; Darby, Dr. George D. B.; Darlington, H. S.; Datz, Alois P.; Davis, Charles Gibbons; Davis, Edward T.; Davis, S. Boyer; Davis, W. Wayne; Deaver, Dr. John B.; Depew, J. A.; Dick, William A.; Dickinson, Philemon; Dillenbeck, Clark; Disston, Albert H.; Disston, Frank; Disston, Jacob S.; Disston, William; Dobbins, Murrell; Dobbins, T. Monroe; Dodge, James Mapes; Dodge, Kern; Dolan, Clarence W.; Dolan, H. Yale; Doughten, W. W.; Douglass, Dr. Malcolm; Drexel, George W. C.; Drueding, Henry G.; Drysdale, Dr. W. A.; DuPont, Alfred I.; Durham, Israel W.

Ehret, Michael; Eisenlohr, Lois H.; Ellis, Charles E.; Ellison, Norman; Ellison, W. R.; Elverson, Jr., James; Endicott, Henry B.; Ely, Dr. Thomas C.; Erb, E. S.; Este, Charles; Evans, Powell.

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Gallagher, John A.; Gamble, Dr. R. G.; Gawthrop, W. W.; Gerhard, Dr. George S.; Gibbs, William F.; Gibbs, William W.; Gibney, James L.; Gibney, John L.; Gillette, Charles H.; Girvin, Dr. John H.; Godfrey, Lincoln; Godfrey, William S.; Godshalk, C. A.; Godshalk, E. H.; Good, J. William; Goodman, Leon; Gowen, Francis I.; Graham, Dr. Edwin E.; Grange, Alexander D.; Grange, William D.; Greenough, Grafton; Griffith, W. O.; Griscorn, Rodman E.; Groscholz, Charles F.; Grove, Henry S.; Gundfinger, G. J.; Gwyn, Dr. Norman B.

Halsey, James T.; Hamill, Dr. S. McC.; Handy, Charles; Hansell, Frank P.; Hardart, Frank; Hardart, Jr., Frank; Harmer, A. C.; Harper, D. Walter; Harris, J. Campbell; Harrison, Jr., C. C.; Harrison, W. Frazier; Harrison, Jr., W. Welsh; Hart, Harry M.; Harte, Dr. Richard N.; Hartz, M. N.; Harvey, R. Wistar; Hauck, Philip; Hawkins, E. L.; Hebard, Charles S.; Hebbner, Samuel Y.; Heller, Clyde A.; Helme, William E.; Hendrickson, S. A.; Henson, Dr. William F.; Hetherington, Albert G.; Hetzel, George C.; Hicks, Charles M.; Hicks, H. Sherwood; Hill, Dr. Howard K.; Hollar, William H.; Hoopes, Macmillan; Horrocks, William B.; Houston, Howard H.; Howard-Smith, S.; Howe, Dr. Herbert M.; Huhn, Jr., George A.; Huhn, Samuel P.; Huhn, W. Tevis; Hunter, William T.; Hutchinson, Sydney E.

Innes, Reginald H.

Jackson, J. T.; Janney, Jr., Joseph A.; Janney, Robert M.; Jay, Webb; Jayne, Charles A.; Jayne, Henry W.; Jayne, J. Warren; Jenkins, Jr., Warner H.; Johnson, Alba B.; Johnson, Ferdinand M.; Johnson, John R.; Johnson, Philip H.; Jones, Horace C.

Keenan, Julian J.; Kelsey, C. W.; Kemble, Isaac W.; Kennedy, Albert E.; Kennedy, Jr., Frank G.; Kennedy, Franklin W.; Kent, A. Atwater; Kirk, Dr. George W.; Klem, Jr., J. George; Knadler, George W.; Knight, Joseph S.; Knight, T. Howard; Kolb, Louis J.; Kugler, Clarence B.; Kuhn, Hartman C.; Kyle, Dr. D. Braden.

Lea, Arthur M.; Lea, Charles M.; Lea, George H.; Leeds, Arthur N.; Lewis, Dr. Norris J.; Lillie, Lewis; Linnard, George B.; Lippincott, Craig; Lippincott, Bertram

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MacCalla, W. A.; Macfarlane, W. W.; Madeira, Percy C.; Malpass, George; Maltby, Albert E.; Manwaring, Halsey A.; Marsden, Dr. Biddle R.; Martin, Hon. J. Willis; Mastbaum, J. E.; Matthews, Louis I.; Maule, William H.; Mauran, Frank; Mayer, George Lewis; Mechling, Benj. S.; Megargee, M. B.; Middleton, C. Wilmer; Miller, Daniel; Miller, Ewing L.; Mills, George M.; Mitchell, 3rd, John K.; Mitchell, S. Murray; Montgomery, Dr. E. E.; Montgomery, Robert L.; Moore, William J.; Morgan, John; Morris, Francis B.; Morris, Henry G.; Morris, Herbert; Morris, Lemuel I.; Morris, William H.; Morse, I. J.; Morse, Jr., J. Lewis; Moss, Frank H.; Muckle, Jr., M. R.; Musser, Dr. John H.; McCahan, Jr., William J.; McClary, William J.; McCormick, Laurence; McCormick, W. M.; McCrea, James; McFadden, George; McFadden, George H.; McFadden, John H.; McGaw, Robert F.; McInnes, Charles E.; McNeely, George H.; McNichol, James P.

Nathanson, Harry M.; Neel, Percy L.; Neely, Robert T.; Neill, W. W.; Nicholson, Edgar W.; Norris, Francis C.

Oguri, T. K.

Page, Jr., Joseph R.; Page, Louis R.; Parsons, John B.; Parsons, Lewis H.; Patterson, Dr. Francis; Patterson, Frank T.; Patterson, James W.; Paul, Jr., James W.; Pendleton, Major E. Gray; Penrose, Morris; Peterson, R. W.; Pettit, Horace; Phillips, G. B. McC.; Phillips, W. Vernon; Pickering, Jr., Charles W.; Pickering, M. Joseph; Platt, Alonzo W.; Porter, Jr., Charles A.; Porter, J. Madison; Potter, Wilson; Potts, Francis L.; Price, Jr., J. Sergeant.

Ralph, I. D. H.; Rawle, Edward P.; Rea, Samuel; Reilly, Garrett L.; Riley, Lewis A.; Reilly, J. Ridgway; Rippien, Paul P.; Roberts, G. Brinton; Robinson, E. M.; Robinson, Dr. W. Duffield; Roelofs, Henry H.; Rosenberger, A. P.; Rosengarten, Frederic; Rosengarten, H. B.; Ross, Dr. George G.; Ross, Walter L.; Rothermel, Jr., P. Fred; Rufe, Morris; Rushton, Kenneth; Rushton, Richard H.

Scattergood, Henry W.; Schaum, Otto W.; Schenck, Dr., J. H.; Schenck, Jr., Joseph H.; Schoening, Charles F.; Schweinitz, Dr. George E. De; Scott, Edgar; Scull, William Ellis; Seeds, Jacob J.; Seeds, Joseph R.; Seyfert, Samuel R.; Seyfert, William; Shanbacker, S. J.; Shelton, Fred H.; Sheppard, William B.; Sheridan, George H.; Shoch, Henry R.; Silverman, I.

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H.; Simpson, William; Sinkler, Dr. Wharton; Siter, Dr. E. Hollingsworth; Sloan, Charles F.; Smith, Edward B.; Smith, Edward E.; Smith, J. Emlen; Smith, Walter B.; Smith, William Francis; Smith, William T.; Spear, Jr., James; Spencer, William; Stahr, John A.; Stambach, M. R. M.; Starr, Isaac; Starr, Isaac T.; Steck, Edward M.; Steel, Robert W.; Steltz, S. A.; Stern, William A.; Stillman, Harold B.; Stinson, Samuel B.; Stoever, H. vH.; Stotesbury, E. T.; Stovell, Charles L.; Stratton, Harrison D.; Strittmatter, Dr. I. P.; Supplee, William L.; Swain, Charles J.; Swain, W. Moseley; Sweany, Dr. F. L.

Tatnall, Emmett R.; Taylor, Dr. J. Gurney; Thacher, Dr. George H.; Thiel, Max; Thomas, Alfred R.; Thomas, Edwin M.; Thomas, Jr., George C.; Thomas, Richard H.; Thompson, George T.; Thornton, Samuel S.; Toland, Robert; Townsend, Charles C.; Turner, O. A.; Tustin, Ernest L.; Twells, Herbert N.; Tyler, George F.

Van Leer, William M.; Van Rensselaer, Alexander; Vauclain, Samuel M.; Vetterlein, J. Roy.

Walton, S. Davis; Wampole, Henry S.; Wanamaker, Jr., William H.; Warburton, Barclay H.; Warner, Charles S.; Weaver, Dr. H. S.; Webb, C. Edwin; Weber, William E.; Webster, D. W.; Welsh, Charles N.; Welsh, Edward L.; West, Erwyn P.; West, W. B.; Wharton, J. S. Lovering; Wheeler, Charles; Whilldin, John S.; Whitaker, Robert; White, Dr. J. William; Whiting, Dr. A. D.; Whitney, Charles H.; Whitney, William W.; Widener, George D.; Windrim, John T.; Wiggins, John R.; Wilkins, Jr., John N.; Wilson, Dr. J. C.; Winston, J. C.; Wister, Jones; Wolf, Clarence; Wolstenholme, Alfred; Wood, 3rd, Alan; Wood, Alan G.; Wood, Dr. Alfred C.; Wood, Richard G.; Work, Milton C.; Wright, Philip E.; Wright, Samuel; Wright, W. D. Craig; Wurts, Jr., C. S.; Wright, Sydney, L.; Wright, William T.

Young, Horace L.

Zeigler, Dr. Walter M. L.

AUTOMOBILE CLUB OF PITTSBURGH, PA.

ACTIVE MEMBERS.

Adams, S. Jarvis; Aiken, Henry; Alexander, Jos.; Atterbury, Jos. M.; Atterbury, J. Seam.

Badger, W. R.; Bailey, Geo. H.; Banker, Arthur; Baum, Wm. P.; Baxter, A. B.; Beal, Jas. H.; Belden, S. B.; Bennett, W. W.; Benson, B. F.; Berger, A. B.; Bindley, Wm. A.; Bishoff, L. H.; Black, David P.; Braden, Glenn T.; Bragdon, Jno. C.; Brainard, J. W.; Bray, C. W.; Brown, Henry Graham; Brown, Jas. E.;

Automobile Club of Pittsburgh (Cont.)

Bruning, Max; Burchfield, A. H.; Burns, Jr., Wm. J.; Byers, E. M.; Byers, J. Frederic.

Carlin, D. N.; Carothers, Jas.; Carter, E. C.; Childs, Otis H.; Clemson, Ralph E.; Cochran, T. I.; Coffin, Wm. C.; Collins, D. P.; Collins, Henry L.; Cook, Thos. McK.; Croft, H. W.; Crookston, A. V.; Curry, Grant.

Darley, W. W.; Davis, H. P.; Deshon, W. B.; Dixon, Chas. H.; Dixon, W. L.; Donner, W. H.

Eaton, Dr. P. J.; Epping, W. N.; Emmerling, Dr. Karl.

Fawell, Jos.; Feely, H. M.; Ferguson, Jno. M.; Fischer, F. W.; Fisher, H. F.; Fisher, H. I.; Fisher, J. A.; Fletcher, J. Gilmore; Flinn, Geo. H.; Flinn, Philip S.; Flinn, R. E.; Flinn, Hon. Wm.; Fownes, Henry C.; Frank, I. W.; Frauenheim, A. A.; Frick, H. C.

Garland, Robert; Glass, Geo. G.; Gleffer, H. W.; Glesenkamp, J. A.; Goehring, J. H.; Goettman, Geo. P.; Goettman, John; Graham, Chas. J.; Grimes, Jas. F.; Guffey, Thos H.

Hailman, Geo. L.; Hammond, Jas. H.; Hartley, Thos. R.; Hartupée, Wm. D.; Hasley, H. G.; Hawkins, Dr. Jno. A.; Hehr, George; Heinz, Clarence N.; Hermes, Peter; Hershman, O. S.; Hesperheide, H. W.; Hesperheide, Jr., H. W.; Heyl, Wm. A.; Holdship, C. F.; Horne, Durbin; Hostetter, D. H.; Humphreys, Wm. Y.; Hunter, F. M.; Hurd, W. L.

Iams, J. E.; Ingersoll, Fredk.; Irwin, Chas. C.

Jackson, M. R.; Jamison, Miss M. A.; Jenkins, E. B.; Jenkins, Jr., Robt.; Johnson, Willis S.; Johnston, Dr. Geo. C.; Jones, Thos P.

Kaufmann, Alfred D.; Keller, E. E.; Kelly, Jr., Geo. A.; Kennedy, Julian; Kennedy, R. G.; Kent, Edw. J.; Kern, E. A.; Kerr, Wm. A.; Kindl, F. H.; King, Dr. J. R.; Kirk, David M.; Kiser, Earl; Kneeland, Edward; Knotts, Geo. W.; Kuhn, W. R.

LaFountain, W. H.; Lanahan, J. S.; Laughlin, Alex.; Laughlin, Thos. K.; Lennox, Snowden G.; Leslie, A. H.; Leslie, M. F.; Lewis, Bernard W.; Lincoln, Kirk P.; Lloyd, F. H.; Lloyd, S. H.; Lockhart, Jas. H.; Lockhart, J. M.; Lovejoy, F. T. F.

McCoy, E. E.; McCune, F. A.; McCune, John R.; McGrady, Jno. W.; McGraw, E. C.; McKay, Robt. J.; McKenna, T.

Automobile Club of Pittsburgh (Cont.)

Morrison; McKay, Thos. V.; McKesson, J. S.; McLaughlin, C. F.; McNally, Thos. Marshall, D. J.; Martin, L. G.; Mason, Jr., H. L.; Masten, A. E.; Matheson, C. P.; Mellon, Edw. P.; Mellon, R. B.; Mellon, Wm. L.; Miller, C. M.; Miller, Henry J.; Miller, H. M.; Mills, Jas. W.; Montgomery, Gordon; Moore, A. P.; Moore, G. P.; Moreland, A. M.; Morrow, J. R.; Mudge, E. W.; Murray, W. N.

Neeb, A. R.; Nevin, Ernest D.; Nicola, O. P.; Nieman, A. E.; Nimick, Frank B.; Nimick, W. H.

Ober, John P.; Ohl, J. A.; Oliver, Geo. T.; O'Neill, Florence; Osborne, L. A.

Painter, Geo. E.; Peacock, A. R.; Perkins, F. C.; Perkins, H. H.; Phillips, Watson P.; Phipps, Lawrence, C.; Pollard, Richard; Pope, Chas E.; Pope, Frank B.

Rea, H. R.; Read, A. C.; Reed, Jr., Jas. Hay; Reineman, L. E.; Reinerstein, Rex; Richard, F. H.; Richwine, W. A.; Riter, Jos.; Robinson, A. Blaine; Robinson, W. C.; Rodgers, Mrs. Elliott; Rowe, Wallace H.

Saupp, F. D.; Scaife, W. B.; Schellentrager, E. J.; Seaman, J. S.; Shea, Jos. B.; Sinclair, F. M.; Smith, J. C.; Speer, J. McK.; Speer, J. Ramsey; Spuhler, Henry J.; Stauffer, W. F.; Stenger, Robert; Stephenson, G. W.; Stewart, S. A.; Straub, Herman; Straub, T. F.; Stubbe, J. H.; Succop, C. E.; Succop, Robt.

Thaw, J. C.; Todd, Henry C.; Topping, Jno. A.; Trees, J. C.; Turner, Geo. E.

Urling, Dr. Geo. A.; Urling, Dr. H. W.

Vaux, Dr. C. J.; Vensel, W. W.; Vestal, O. E.

Wainwright, Jr., E. Z.; Wallace, Daniel H.; Warren, W. A.; Warwick, J. G.; Weaver, R. M.; Werner, O. H.; Whitcomb, E. P.; Whithaus, Chas. C.; Wolff, Paul C.

Yohe, Jr., J. B.

Zug, Chas. H.

ASSOCIATE MEMBERS.

Anderson, James; Anderson, S. H. Barr, J. Toner; Beymer, A. S.; Bradley, G. J.; Brown, R. R.

Carter, Chas Gibbs; Clark, E. C.; Cook, F. B.; Crawford, Hon. Jno. W.; Crouch, A. W.

Dickson, R. G.; Dinger, R. E.

Farren, H. H.; Feick, Geo.; Felix, O. F.; Fleming, C. J.; Forner, W. F.; Fownes, E. S.

Automobile Club of Pittsburgh (Cont.)

Goff, Homer.
 Hubbard, C. S.
 Johnston, Chas. W.
 Kreusler, H. L.
 LaPorte, Robt. H.; Leng, C. F.; Lyons, Jno. R.
 McBride, Geo. W.; McClure, F. E.; McKinney, Grant; McKeown, S. A.; McMarlin, W. J.; Milholland, H. C.; Miller, Maj. C. J. S.; Montgomery, Dr. E. S.; Moth-
 eral, G. B.; Murphy, J. P.; Mustin, W. I.
 O'Bryan, E. G.
 Philp, Arthur I.; Pickering, S. A.
 Smith, W. Linford; Steele, Stewart;
 Stibich, Jno. L.; Stratman, Charles.
 Thornton, A.; Townsend, A. C.
 Ürling, Jr., Geo. A.
 Van Voorhis, H. N.
 Walsh, L. V.; Way, F.; Williams, O. A.; Wilson, J. I. M.
 Young, N. E.

AUTOMOBILE CLUB OF WASHINGTON, (D. C.)

Adams, Byron S.; Ammerman, Charles C.
 Baines, James E.; Barry, C. E.; Bartman, John; Berens, F. C.; Bliven, Frank S.; Burchell, N. L.
 Carmody, J. D.; Carpenter, A. D.; Caverly, R. B.; Chandlee, George H.; Chand-
 lee, Horace C.; Cline, A. L.; Clinedinst, B. M.; Copenhaver, W. A.; Corby, W. S.; Cowl, Benj.; Craig, Harry.
 DeMoll, O. J.; Dorsett, L. P.; Duff, M. H.; Dunigan, David J.; Duvall, William S.
 Earley, J. J.; Edmonds, F. H.; Evans, A. Ward.
 Falconer, J. H.; Flynn, Jas. J.; Flynn, Rodger L.
 Gordon, Fulton R.; Graham, E. C.
 Halstead, Griffin; Harris, S. L.; Hart, Fred; Heater, Robert E.; Henderson, John B., Jr.; Henry, Frank C.; Heyl, John K.; Hood, W. C.; Hough, C. Royce; Hubbard, Jerome; Hunter, H. C.
 Johnson, Chas. H.; Jose, Rudolph.
 Leech, Dr. Frank; Long, W. C.
 Mark, LeRoy; Maxwell, J. B.; McCormick, A. L.; Mills, Harrington; Mirick, H. B.; Mitchell, John E.; Moore, David; Morrison, J. May; Moses, Arthur C.; Muehleisen, J. A.
 Newman, Arthur G.; Newman, E. S.; Nolan, John H.; Norment, Harry; Nussbaum, E. P.
 O. Brill, Chas.

Auto Club of Washington (D. C.) (Con.)

Portner, Alvin O.; Portner, Edward G.; Portner, Oscar; Portner, Paul; Pyle, F. B.
 Reed, George E.; Rife, John N.; Rosen-
 berg, Maurice D.
 Saks, Joseph I.; Schneider, T. F.;
 Smith, Emmons S.; Snyder, E. H.;
 Spence, P. B.; Spencer, W. S.; Stoddard,
 J. M.
 Thomas, John R.; Tolman, Guy H.
 Wade, G. Taylor; Ward, H. G.; Ward-
 man, Harry; Weaver, W. M.; West,
 William D.; White, George W.; Wiliage,
 J. Louis; Willson, Harry B.; Wood, C. E.
 Zee, Arthur Stanley.

**ATLANTIC CITY (N. J.) AUTOMO-
 BILE CLUB.**

Albert, H. C.; Algar, Leonard D.
 Bacharach, Isaac; Barrett, David R.;
 Bell, A. T.; Brodhead, Frank A.; Buzby,
 Walter J.
 Cherry, W. J.; Cook, Franklin P.; Cook,
 Harry B.; Corkran, H. W.; Cuthbert, E. H.
 Darnell, A. H.; Donnelly, John.
 Edge, Walter E.
 Gummey, Brinkle.
 Haines, Newlin, Hemsley, Frederick,
 Hoopes, L. H.
 Johnson, A. P.; Johnson, Enoch, S.;
 Johnston, Robert M.
 Kuehnle, Louis.
 Leeds, H. B.
 Maaz, John A.; Marsden, Al.; Marvel,
 Dr. Emery; Marvel, Dr. Philip; McAuliffe,
 Thomas; Metz, Thomas O.; Miller, George;
 Mittag, F. O., Jr.; Moore, Samuel, W.;
 Muhlrad, William; Myers, Charles R.
 Nichols, Armand T.
 Pheobus, Frank; Potter, Charles, Jr.;
 Potter, Col. Thos., Jr.
 Rusk, Samuel.
 Scott, Lewis P.; Shaw, E. C.; Sheck, M.
 Howard; Somers, Hubert; Somers, War-
 ren; Smith, W. T.
 Thompson, W. B.
 Westcott, Dr. A. L.; White, Charles D.;
 Wilson, H. Aug.; Wilson, Hugh A.; Wil-
 son, Thos. K.

**AUBURN (N. Y.) AUTOMOBILE
 CLUB.**

Allen, G. W.; Avery, R. B.
 Barrett, Geo.; Beardsley, Mary D.; Ben-
 ham, G. W.; Bennett, Dr. C. H.; Bowen,
 G. W.; Butler, T. J.
 Caldwell, Emory; Case, W. E.; Child, J.
 H.; Coe, W. H.; Crumb, H. F.
 Digmun, Thomas.
 Fay, C. R.; Frank, Wm.

Auburn (N. Y.) Automobile Club (Con.)

Hanning, R. J.; Heaton, Edgar; Hoyt, H. L.

Jones, J. A.

Lattimer, Harry; Lattimer, Jr., H. G.; Leonard, E. L.; Leonard, G. H.

Meaker, C. G.; Meaker, L. P.; Messenger, Frank; Metcalf, E. D.; Metcalf, E. F.; McCarthy, C. A.

Osborn, T. M.

Parker, A. J.; Poméroy, Jr., T. M.

Richardson, F. W.; Romig, Hobart; Ross, E. N.

Sagar Co.; Sharp, C. S.; Shaw, J. T.; Sluscher; H. S.; Smith, Irving W.

Tallman, Bradford, Tallman, S. C.; Teneyck, F. C.; Tuxill, E. E.

Wadsworth, David; Wait, W. F.; Whitney, G. W.; Willis, Leland; Woodin, W. E.

Yorkes, H. E.

Zabriskie, A. M.

BELOIT (WIS.) AUTOMOBILE CLUB.

Aldrich, A.

Bennett, Dr. L. F.; Buckeridge, Dr. Isaac; Brittan, Walter M.

Forbes, L. D.; Foster, D. H.

Hall, W. D.; Helm, Dr. A. C.

Lipman, Carl E.; Lipman, E.

Rockwell, Roy.

Saris, J. H.; Strong, F. M.

Vale, Harry M.

Warner, A. P.; Warner, C. H.

Yates, P. B.

BINGHAMTON (N. Y.) AUTOMOBILE CLUB.

Ash, Benjamin.

Barlow, Jr., G. H.; Barlow, Sr., G. H.; Barnes, F. E.; Bayless, F. J.; Beardsley, Guy; Brooks, F. L.; Brown, H. W.; Bundy, H. E.

Crary, T. B.; Clinton, A. W.; Clinton, L. R.; Collier, C. E.; Collier, C. R.; Collier, H. C.; Conklin, H. E.; Corbett, M. J.; Cornell, W. T.

Davidge, G. G.; Davidge, J. M.; Davidge, S. R.; Davis, F. M.

Eitapenc, F.

Faatz, W. G.; Frechie, S. M.

Gale, John A.; Gaylord, W. H.; Goldsmith, H.

Hall, C. H.; Hammond, Fred F.; Hecox, W. H.; Heller, L. L.; Hotchkiss, Clarence; Hough, Dr.; Hull, John; Hummell, P. M.; Hutchinson, H. S.

Binghamton Automobile Club (Cont.)

Johnson, C. F.; Johnson, Geo. F.

Kilmer, J. M.; Knapp, F. Percy; Kattell, E. E.; Kilmer, Willis Sharpe.

Lacey, J. W.; Lewis, John; Lounsberry, L. R.

McFadden, B. B.

Newell, F. B.; Newell, W. W.; Niles, Harry; Noyes, J. K.

Parsons, A. J.; Phelps, W. G.; Phelps, Z. Bennett; Pierce, N. M.; Phillips, Dr.; Pratt, Col. C. C.; Prentice, Jas. I.; Protzman, H. I.

Roe, Dr. J. F.; Rogers, G. T.; Russell, R. M.

Sisson, C. F.; Smith, A. B.; Stone, C. M.

Titchener, C. E.

Wagner, Chas. G.; Weed, Lewis; Welden, B. F.; Wilcox, W. H.; Wilson, L. M.

CHICAGO (ILL.) AUTOMOBILE CLUB.

Abbott, F. D.; Adams, H. C.; Adams, Elmer H.; Adland, Victor E.; Adler, Sidney; Agee, Joseph A.; Alexander, J. J.; Allen, Chas. A. Jr.; Allman, Claude W.; Ambler, Eugene; Ames, Knowlton L.; Anderson, Benjamin N.; Anderson, Benjamin N.; Anderson, Herbert J.; Andrews, A. M.; Apperson, Edgar L.; Apperson, Elmer; Arbogast, E. W.; Armour, J. Ogden; Armstrong, Richard; Austin, Walter S.; Austrian, Leo; Ayers, B. B.

Baackes, F.; Bailey, Theo. P.; Baker, Walter C.; Baker, Wm. H.; Baldwin, Willis M.; Banks, A. F.; Banta, A. J.; Barnes, W. F.; Barnheisel, Frederick R.; Bartlett, Frederick H.; Bate, John W.; Bayliss, James E.; Beck, Burt, A.; Beck, Chas. A.; Beck, Raymond A.; Beardsley, Le Roy; Becker, James H.; Beifeld, Joseph; Bell, H. E.; Bement, A. B.; Benham, John; Bennett, H. J.; Bennett, Geo. W.; Bensinger, B.; Benson, F. A.; Benton, Joel; Berg, Max A.; Berry, C. D.; Berry, Sagar; Bird, George H.; Birk, Edward J.; Borland, Chauncey Blair; Blair, Henry A.; Blocki, F. W.; Bogle, Walter S.; Boland, John; Bollman, Ben; Born, M.; Bostwick, Frank A.; Bour, C. J.; Bradley, Ralph R.; Brand, H. L.; Brand, Fred P.; Brandt, Ernst H.; Bregman, L. I.; Bremerman, Lewis W.; Brewster, C. P.; Briscoe, Benjamin; Brown, Albert L.; Brown, C. M.; Brown H. H.; Brown, Marshall L.; Borland, Bruce; Bucklen, H. R.; Budlong, M. J.; Bullen, Fred F.; Bunge, Albert J.; Burbank, Henry C.; Burdett, J. B.; Burnell, H. M.; Burns, John E.; Burns, P. C.; Burns, R. J.; Busse, Fred A.; Byllesby, H. M.

Chicago Automobile Club (Continued)

Calahan, John Y.; Campbell, Arch M.; Campbell, Robert W.; Canfield, Charles J.; Carney, W. J.; Carpenter, Paul; Carroll, James R.; Cartwright, M. H.; Case, C. C.; Caswell, Chas. L.; Cavanaugh, J. B.; Chapin, G. S.; Charlton, Geo. J.; Charter, James A.; Cheney, William W., Jr.; Church, Archibald; Clark, John M.; Clark, T. J.; Clarkson, Worrell; Cobe, Ira M.; Coey, C. A.; Coleman, W. O.; Collins, J. D.; Colvin, E. M.; Conklin, Jas.; Connery, John T.; Coonley, Prentiss L.; Cordner, E. Q.; Cornish, Fred W.; Countess, F. D.; Cowdrey, E. G.; Crane, George A.; Cressler, A. D.; Curtis, James C.

Dawes, Charles C.; Davidson, George M.; Davie, Geo F.; Davies, Colby; Davis, Frank H.; Dayton, F. E.; Dee, Wm. E.; Deering, Chas.; Deering, James; Defebaugh, J. E.; Deibler, Byron J.; Deneen, Chas. S.; Devitt, M. A.; Devlin, Arthur; Devlin, Frank A.; Dickason, L. T.; Dillman, Louis M.; Dodge, Martin F.; Douglas, Frank W.; Downing, Wm. F.; Dows, Wm. G.; Dowse, B. C.; Draper, Herbert L.; Drum, A. L.; Dryburgh, Alex.; Dugan, R. A.; Dummert, Henry; Duncan, J. S.; Duntley, J. W.; Duntley, W. O.

Earl, E. H.; Eastman, Albert N.; Eastman, John C.; Eastman R. M.; Eckert, A. P.; Egermann, W. A.; Edgerton, I. V.; Edwards, Arthur R.; Edwards, F. E.; Egan, Chas. W.; Ehrhart, Geo. W.; Eldridge, E. P.; Ellis, Jerome A.; Ellwood, E. P.; Emery, John T.; Encell, F. E.; Estep, E. R.; Ettinger, Chas. D.; Evans, R. O.

Fahrney, Ezra C.; Fahrney, E. H.; Fahrney, J. H.; Fahrney, W. H.; Farson, John; Fay, Owen H.; Fauntleroy, T. S.; Ferguson, E. C.; Fielding, Frederick J.; Filbert, W. J.; Finch, Hunter W.; Fischer, Louis C.; Fish, Joseph; Fisher, John T.; Fisher, Lucius G.; Fitch, Lawrence; Fleming, Samuel B.; Foreman, Oscar G.; Foreman, Milton J.; Fosgate, C. Henry; Foster, C. H.; Frank, M. K.; Franklin Edward T.; Freschl, A.; Freshman, Arnold; Friestedt, L. P.; Frost, A. C.; Fuetado, R. S.; Funk, DeLos; Furey, Chas. L.

Gallagher, A. J.; Gardner, J. T.; Geist, Clarence H.; Genius, Arthur E.; Gerts, Walter S.; Gethro, Fred W.; Getz, Geo. F.; Gibbons, Harry R.; Gibson, Guy G.; Gillett, Chas. W.; Gilmore, C. W.; Githens, Herbert A.; Githens, Walter L.; Gleason, W. P.; Glogauer, Fritz; Goddard, A. J.; Goldman, Eugene; Goodhart, Chas. I.; Gore, Edward E.; Gorham, Sidney S.; Goss, S. G.; Graff, Henderson D.; Grassie, Edgar

Chicago Automobile Club (Continued)

J.; Gray, F. M.; Greenberg, George G.; Gregory, Chas. E.; Greve, Charles; Grey, William L.; Griffin, Geo. F.; Griffiths, Geo. W.; Grundy, C. Fred; Gunning, Robert J.; Gunther, Jos. F.

Hall, Chas. R.; Hall, Horatio L.; Hall, W. F.; Hamill, Ernest S.; Hamilton, Burton C.; Hamilton, Isaac Miller; Harmon, Charles Sumner; Harris, Graham H.; Harris, Harmon A.; Harris, Jos.; Harris, Sanford F.; Hart, Milton, R.; Hart, Stillson H.; Hartman, Leon; Hartwell, F. G.; Hatelly, C. F.; Hatelly, John C.; Hawley, Henry S.; Hay, Thomas J.; Hayden, J. W.; Hayes John J.; Haynes, Elwood X.; Haynes, J. W.; Haynes, W. Knox; Hepburn, J. C.; Hermann, C. H.; Hertz, John D.; Hewitt, C. M.; Hildreth, Ward; Hill, Anthony S.; Hill, Calvin H.; Hills, Chas. W.; Hill, William C.; Hippach, L. A.; Hirsh, H. E.; Hixon, G. C.; Holbrook, E. M.; Hook, Barbee, S.; Hook, W. S., Jr.; Hooper, W. E.; Hoops, W. H., Jr.; Hoops, William H., Sr.; Hoover, Frank K.; Horrie, C. R.; Howard, Homer G.; Howard, Louis A.; Howe, Richard; Hubbard, H. A.; Hulman, H., Jr.; Hurd, Harry B.; Hyman, T. J.

Insull, Samuel; Irwin, Alexander; Irwin, Samuel P.; Isbell, Wm. G.

Jackson, George W.; Jackson, Horace; Jackson, John L.; Jacobs, Fred M.; James, David; Jameson, C. S.; Jaques, F. F.; Jay, Webb; Jeffrey, Chas. T.; Jennings, C. A.; Jeter, C. E.; John, George C.; Johnson, Buron B.; Johnson, E. F.; Johnson, J. M.; Johnson, Waldo P.; Johnson, W. O.; Jones, Arthur; Jones, Walter; Joyce, David G.; Joyce, J. Stanley; Joyce, Wm. T.; Judd, Chas. B.

Kathrens, Joseph R.; Keating, Leonide; Keeley, Thomas F.; Keller, D. F.; Kelly, W. L.; Kesner, J. L.; Kilbourne, Lyman Bernard; King, Arthur J.; Kinsey, Carl D.; Knap, Wm. H.; Knisely, C. T.; Knobbe, John W.; Koehler, T. N.; Kohn, Alfred D.; Kretzinger, George W.; Kronthal, Benjamin; Kuppenheimer, A. B.

Lacey, J. D.; Lamb, Charles A.; Larsen, John M.; Lau, Max; Lebolt, George W.; Leeper, Samuel; Lehmann, E. J.; Leicht, Edward A.; Leimert, Joseph T.; Leisy, Albert E.; Lenehan, J. H.; Leopold, Alfred F.; Leonard, H. A.; Leszynsky, Edward G.; Lewis, Wm. Mitchell; Lilienfeld, E. D.; Lilienfeld, E. W.; Lipville, J. A.; Lloyd, Wm. Bross; Lloyd, W. G., Jr.; Loftis, S. T. A.; Logan, Frank G.; Long, Charles R., Jr.; Long, J. B.; Lovell, John Gibbs; Low, W. W.; Luce, Charles A.; Lundy, A. D.; Lutz, T. C.; Lyman, Wm.; Lyon, Mark T.; Lytton, Geo.; Lytton, Henry C.

Chicago Automobile Club (Continued)

Marshall, Thomas A.; McCarthy, M. H.; McCord, A. B.; McCormick, Harold F.; McCoy, Russel B.; McCready, E. W.; McCulloch, Geo. F.; McDuffee, J. H.; McKelvey, J. H.; McKenna, Philip J.; McKinnon, John W.; McMichaels, J. G.; McMullin, Frank R.; McPherson, John C.; Madison, P. Chester; Magie, Frank Ogden; Maher, George W.; Mallen, H. W.; Maloney, W. F.; Mangler, Wm.; Marshall, Benjamin H.; Marshall, Thomas A.; Martel, G. J.; Martin, S. K.; Martin, T. J.; Martin, Walter I.; Mason, Wm. H.; Matthiessen, Frank; Mayer, Levy; Mead, W. J.; Megeath, George; Merz, E. G.; Metzger, Carl J.; Meyer, Abraham; Meyer, E. E.; Miles, S. A.; Miley, C. D.; Miller, H. I.; Mills, Walter; Milner, J. T.; Mitchell, Jno. J.; Mitchell, Wm. N.; Modjeski, Ralph; Mohr, Albert; Moir, Harry C.; Moore, Chas. W.; Moorhouse, W. R.; Moos, J. B.; Morava, W.; Morrill, A. A.; Morrill, Chas. E.; Morris, Ira; Morrow, J. B.; Morton, Joy; Morton Sterling; Moulton, D. A.; Moyer, Martin N.; Mudd, Frank X.; Mundy, Walter J.; Murphy, C. C.; Murray, W. J.; Myers, L. E.

Naghton, James I.; Nelson, E. D.; Newby, Arthur C.; Newman, A. B.; Newton, Chas. A.; Noake, John T.; Noble, Edward; Noe, E. C.; Norton, Arthur W.; Noyes, LaVerne W.; Nuckols, Henry W.; Nutt, Frank A.; Nyberg, Henry.

Oelrich, F. A.; Ogle, Geo. A.; O'Hare, J. H.; Oliver, James, 2nd; Olson, A. J.; Olsen, O. C. S.; Ormsby, A. Scott; Orr, Dr. H. M.; Otte, Louis E.; Overshiner, E. B.

Pabst, Gustave; Palmer, J. F.; Pam, Hugo; Pardee, F. J.; Paulman, Henry; Peacock, Chas. D., Jr.; Peaslee, C. M.; Perry, D. P.; Peterson, K. Franklin; Pettit, James; Philip, Arthur I.; Pierce, W. R.; Pierson, D. B.; Pietsch, Frank H.; Pine, M. B.; Pirie, Allan; Pitcher, L. W.; Plamondon, Chas. A.; Plew, James E.; Poole, Clark L.; Pope, Chas.; Porter, J. W.; Powers, H. I.; Pratt, A. L.; Pratt, E. H.; Pratt, W. A.; Pratt, W. H.; Primley, J. P.; Pugh, James A.; Puterbaugh, Walter.

Quinlan, Jr., T. A.

Randle, C. H.; Randolph, R. J.; Ray, Allen S.; Raymond, James N.; Rawson, F. H.; Rehn, Wm. H.; Reynolds, Geo. M.; Richards, J. T.; Richardson, D. D.; Riggs, Frank C.; Riker, A. L.; Riley, Clyde, W.; Robie, Fred C.; Robie, George T.; Robbins, Arthur M.; Robbins, F. R.; Robbino, Geo. B.; Robinson, Jr., Richard Taylor; Robinson, Frederick; Rogers, S. M.; Root, Ralph G.; Rose, E.; Rosenfield,

Chicago Automobile Club (Continued)

Walter A.; Rosenthal, George D.; Rosenthal, Julius; Ross, John F.; Roth, John C.; Rounds, Fred C.

Sage, Donald A.; Sanders, J. F.; Sargent, Geo. M.; Schlessinger, B. F.; Schram, A. J.; Schreiber, J. F.; Schureman, J. L.; Scully, A. B.; Seaman, R. L.; Sears, R. W.; Seipp, Conrad; Severns, E. C.; Seymour, Claude; Shaffer, Carroll; Shaffer, Kent; Shattuck, A. W.; Shaw, Walden W.; Shaffer, J. C.; Shedd, John C.; Sheldon, R. Skiff; Shepard, Stuart G.; Sheridan, Thomas F.; Sheriff, Andrew R.; Silverman, George; Simmons, Russell M.; Sinsabaugh, G. G.; Smith, A. E.; Smith, Frank L.; Smith, Franklin P.; Smith, Fred B.; Smith, Harry T.; Smith, Henry Clay; Smith, Henry L.; Smith, Walter R.; Southward, J. F.; Spear, Frank R.; Spoor, J. A.; Stanley, John M.; Steffens, A. B.; Stettauer, J. Lewis; Stevens, J. W.; Steward, G. S. B.; Stewart, J. K.; Stewart, W. T.; Stevens, Chas. A.; Stone, Frank B.; Stone, H. O.; Strahorn, Harry C.; Stringfield, C. P.; Studebaker, Col. Geo. M.; Stumer, A. R.; Sturdy, J. F.; Sulzberger, C. F.; Sutherland, W. J.; Swift, Charles H.; Swift, H. B.; Sykes, Bernard G.

Tarrant, Jr., Robert; Taylor, H. N.; Taylor, W. W.; Temple, Ralph; Tennant, William G.; Terrill, A. S.; Theurer, Joseph, Theurer, Peter S.; Thompson, Frank; Thompson, John R.; Thompson, W. M.; Thorne, Geo. R.; Thorne, Chas. H.; Thorne, W. C.; Thornton, E. A.; Thorp, G. G.; Thrall, Sam E.; Tillotson, H. C.; Toppan, W. R.; Townsend, Frederick B.; Turivas, Louis; Tuttle, C. A.; Twomey, William T.; Tyler, A. S.

Uebele, Bert E.; Uhrlaub, A.; Uthlein, Edgar J.; Ullmann, Henry J.; Urquhart, W. J.

Van Sicklen, C. F.; Van Sicklen, N. H., Jr.; Van Sicklen, N. H.; Van Winkle, Chas. F.; Vehon, Morris; Vissering, Harry; Vogel, Eugene W.; Von Westrum, Schade.

Waack, H. C.; Wackenreuter, G.; Waldeck, H.; Waller, Edward C.; Walrath, Wm. B.; Walters, Benjamin S.; Ward, James A.; Ware, J. H.; Warner, A. F.; Washburn, C. G.; Weary, Edwin D.; Weber, Orlando F.; Weems, M. K.; Wells, F. A.; Wells, T. E., Jr.; Welles, R. H.; Wende, F. J.; Wernicke, O. H. L.; Wheeler, Albert G.; Wheeler, Harold H.; Whitaker, I. O.; White, A. J.; White, Walter C.; Whyte, George Stuart; Wight Clarence D.; Wilbur, James B.; Wiley, Willard R.; Willard, Frank E.; Williams, Geo. J.; Williams, Lucian M.; Williamson, John; Willson, A. A.; Wilson, J. H.; Winchell,

Chicago Automobile Club (Continued)

B. L.; Witherbee, Walter E.; Wolf, Leonard H.; Wood, Chas. B.; Wood, Frank B.; Wood, M. M.; Woodley, Wm. T.; Woodman, J. E.

Young, Samuel E.

Zier, Harrison M.; Zimmerman, J. C.; Zoller, Walter G.

CLEVELAND (O.) AUTOMOBILE CLUB.

Abernathy, H. D.; Aborn, W. G.; Adams, H. W.; Adams, W. W.; Allen, Geo. I.; Allen, W. G.; Allen, W. M.; Allyne, E. E.; Anderson, H. B.; Anderson, W. C.; Atwater, A. H.; Auble, Andrew, Jr.; Aufman, Geo. H.; Austin, W. W.; Avery, Henry W.

Babson, R. D.; Baird, Fred J.; Baker, Walter C.; Baldwin, R. H.; Baldwin, S. P.; Balke, A. L.; Ball, H. F.; Bardons, Geo. C.; Barnes, Claire L.; Barnett, Frank B.; Barter, P. L.; Bartol, G.; Beach, E. M.; Beach, Fred W.; Beardsley, Chas. S.; Becker, Bert A.; Becker, J. H.; Bedell, A. H.; Behrend, Ernest R.; Bendelart, F. N.; Benjamin, C. A.; Bennet, Wm. J.; Berg, Chas.; Berner, H. D.; Bidell, W. S.; Biggzz, H. F., Jr.; Bill, Frank R.; Billings, Frank; Bishop, K. D.; Black, Louis; Blackman, C. W.; Blair, D. J.; Blair, W. W.; Blakeslee, Jr., J. R.; Blanchard, H. G.; Blanchard, J. A.; Blood, John H.; Boardman, W. H.; Bockstahler, L. A.; Bolton, L. D.; Bonham, Van Wey; Bonnell, W. F.; Bortlett, C. P.; Borton, Fred S.; Bott, J. A.; Bourne, H. C.; Bourne, J. K.; Bowler, Geo. H.; Bowman, W. J.; Boye, E. B.; Bradley, Alva; Bradley, C. L.; Bradley, G. J.; Brainard, A. H.; Brandenburg, G. G.; Bregman, L. I.; Bretz, J. M.; Briggs, E. W.; Brinsmade, J. C.; Broadwell, E. H.; Brockway, C. B.; Brockway, C. M.; Brown, A. I.; Brown, A. W.; Brown, Geo. H.; Brown, P. J.; Brown, R. E.; Brown, W. H.; Browne, Carl, C.; Bruce, Fred E.; Bryan, Chas. F.; Buchannan, J. A.; Burgess, Fred S.; Burke, Chas. A.; Burke, Vernon H.; Burman, Chas. H.; Burrell, C. A.

Cagwin, T. P.; Caldwell, E. T.; Campbell, T. M.; Carroll, Fred A.; Carroll, W. A.; Carter, J. A.; Case, Geo. S.; Case, J. C.; Castle, F. E.; Champ, Jos. H.; Chandler, F. G.; Chisholm, C. K.; Chisholm, H. M.; Churchill, C. W.; Clappitt, G. S.; Clarage, E. D.; Clark, James H.; Cleveland, M. M.; Clemens, Chester C.; Cluff, Wm. A.; Cody, J. H.; Coit, Chas. H.; Collings, T. C.; Collister, Geo.; Colson, F. W.; Colt, W. L.; Comey, Geo. P.; Comstock, C. W.; Conger, H.; Conlin, F.; Cook, O. R.; Corday, B. F.; Corner, Horace B.; Corwell, Benedict; Cowles, W. B.; Cox, J. D.; Cramp, Court, D.; Crane, F. S.; Craw-

Cleveland Automobile Club (Continued)

ford, W. A.; Creech, Harris; Croxton, H. A.; Cumer, A. B.; Cummer, F. H.; Cunningham, H. L.; Curtis, W. E.; Cutting, Chas. D.

Dalls, Wm.; Dangler, D. E.; Daniels, W. S.; Dauby, N. L.; Dautel, Geo.; Dautel, Leo; Davies, A. M.; Davies, A. R.; Davis, Chas. U.; Day, B. T.; Deming, P. H.; Deming, Robert; De Moy, E. L.; Dench, C. R.; Diebold, Chas. R.; Ditto, P. W.; Dolan, Chas. A.; Dorn, F. P.; Draper, C. T.; Draper, J. S.; Dreher, Henry; Dreher, Oscar; Drew, G. N.; DuBrooy, F. L.; Duerr, C. A.; Duke, Wm.; Dunbar, Wilmer; Dunn, H. F.; Dunn, Sam'l P.; Dyer, H. P.

Eames, Hadyeh; Edmiston, H. T.; Edwards, H. J.; Eels, Howard P.; Evarts, Chas. O.; Everett, H. A.; Ewing, L. E.

Fahey, Peter; Fairbank, Dexter; Faucett, A. J.; Feis, Geo. J.; Ferguson, C. C.; Fewell, H. B.; Firestone, Chas. E.; Firestone, H. S.; Flanders, W. E.; Folsom, David; Fontius, F. J.; Foote, A. Ward; Foote, D. E.; Ford, Carl B.; Foster, A. B.; Foster, B. P.; Foster, C. H.; Foster, O. C.; France, Ira F.; Fuller, H. A.

Gaeth, Paul; Gage, C. H.; Gallagher, Dr. J. V.; Galt, H. A.; Garford, A. L.; Gates, F. C.; Gates, W. N.; Gentsch, Frank F.; Gerkins, R. E.; Gifford, Dr. W. H.; Gilbert, J. M.; Gilchrist, J. I.; Gilman, A. S.; Gilson, J. W.; Girl, Christian; Githens, H. A.; Goddard, Asa; Goodard, H. A.; Goff, F. H.; Goodrich, C. C.; Gordon, Harry; Gorton, W. S.; Goss, M. L.; Graves, W. G.; Gray, Wm.; Green, E. M.; Green, W. B.; Greve, L. W.; Griffiths, E. A.; Grossman, E.; Grothe, Walter; Grothe, Wm.; Grover, M. B.

Hager, H. M.; Haldeman, F. M.; Hall, Arthur W.; Hall, Chas. M.; Hammer, A. K.; Hammer, E. A.; Hammer, T. S.; Harbaugh, C. R.; Hardie, John T.; Harding, F. I.; Harris, Mr. B.; Harris, Howard J.; Hart, Wm. F.; Hartley, S. W.; Harvey, Minor; Haserot, S. F.; Haskins, C. B.; Hatch, Mason B.; Hawley, P. E.; Hayward, J. S., Jr.; Hazen, Geo. H.; Heilbrun, J. M.; Henderson, Thos.; Hess, Chas. M.; Hibbard, J. M.; Hill, Hal H.; Hipp, J. C.; Hitchcock, Ruebin; Hodell, F. G.; Holden, A. F.; Holden, L. E.; Hopkins, J. W.; Hursey, E. T.; Horwitz, Henry D.; Hough, A. H.; Hubbell, E. P.; Hulet, E. W.; Humphrey, D. S.; Hunt, David, Jr.; Huntington, W. R.; Hussey, P. L.

Ingalls, A. S.; Ireland, R. L.

James, E. H.; Jardine, Robert; Jay, Webb; John, Geo. C.; Johnson, Chas. E.; Johnson, H. H.; Johnson, J. F.; Johnson, Hon. Tom L.; Jones, N. M.; Juntzen, Frank J.; Jordan, P. H.; Judd, F. W.

Cleveland Automobile Club (Continued)

Kavanaugh, J. B.; Keeman, D. T.; Keenan, J. W.; Keeton, F. M.; Kelley, Chas. F. W.; Kelly, L. A.; Kennedy, R. G.; King, C. G., Jr.; Kinney, Geo. W.; Kirby, F. E.; Kirk, Ezra E.; Kirk, F. M.; Kirkpatrick, W. H.; Kittridge, L. H.; Knight, Wallace I.; Knight, Wm., Jr.; Knowles, H. Homer; Kohl, Fred W.; Krider, J. A.; Krueger, F. C.; Krum, F. E.; Kundtz, Theo.

Lang, Chas. E. J.; Lang, Elmer J.; Laughlin, Jas.; La Vigne, Alex. A.; Lawrence, C. R.; Lawrence, M. L.; Lawrence, M. W.; Lawrence, Paul T.; Lederer, A. A.; Leininger, C. P.; Leisy, Otto; Lewis, E. W.; Lewis, Jay; Lighthall, M. B.; Lillenthal, Chas. J.; Lindsay, Robt.; Lines, C. W.; Little, Bascom; Livensparger, C. W.; Livingstone, Chas. R.; Long, H. C.; Loughead, Victor; Lucas, H. M.; Lusk, Milton W.

Mac Ananey, Louis L.; Macbeth, J. P.; Magoon, R. H.; Main, Frank H.; Maltby, A. E.; Maltby, Geo. B.; Mandelbaum, M. J.; Manuel, W. S.; Marble, B. L.; Marion, W. C., Jr.; Marks, A. H.; Marquard, Phil. H.; Martin, Wm. B.; Massey, J. R.; Matthews, Herbert; Mathan, Wm.; Maxson, Chester J.; May, A. F.; McArdle, J. W.; McClintock, A. S.; McCrea, J. W.; McGorray, J. V.; McIntosh, H. P., Jr.; McKennery, J. D.; McLachlan, A. D.; McLeod, Alex. J.; McMillan, Geo. B.; McMyler, John; McTige, W. B.; McWatters, J. C.; Meachum, T. G.; Mars, C. W.; Meckers, Waldemar; Mellen, Martin; Merritt, E. A.; Metzger, W. E.; Miller, Fred S.; Miller, W. B.; Mintz, Jake; Mock, C. F.; Montpellier, J. A.; Moody, C. W.; Mooers, Louis; Moore, O. K.; Moore, E. W.; Moore, H. S.; Moore, J. G.; Moore, Dr. J. M.; Moore, V. M.; Morely, Bert; Morgan, P. J.; Morse, Geo. W.; Moskovic, F. E.; Moss, Augustus L.; Murphy, R. E.; Murray, Wm. P.

Nellis, R. H.; Nevins, S. P.; New, Gen.; Newell, Jno. E.; Newman, I. F.; Norman, C. W.; Nutt, J. R.

Oettle, A. J.; O'Laughlin, Sam; Orloff, Peter; Otis, Kenneth Rouse; Owen, R. M.; Owen, R. R.; Owen, Wallace.

Palmer, I. A.; Parker, C. B.; Parkhurst, E. H.; Parson, H. A.; Partridge, W. W.; Patch, C. O.; Patterson, G. S.; Paxson, C. D.; Payne, F. H.; Pearce, J. B.; Pearce, J. B.; Pease, Fred A.; Pechin, Jack S.; Pennock, I. N.; Penrose, Morris; Penton, J. A.; Perkins, H. B.; Perrin, Wm. N.; Peterson, L. T.; Phelps, S. W.; Philip, A. I.; Phillips, F. C.; Phillips, F. W.; Phillips, J. J.; Pickands, H. S.; Pickands, J. M.; Pohlman, C. W.; Poole, John L.; Porter, J. D.; Porter, J. M.; Post, D. J.; Prentiss, F. F.; Price, E. P.; Price, W. D.; Prince, W. D.

Cleveland Automobile Club (Continued)

Quayle, Dr. J. H.

Randles, Geo. E.; Reese, E. S.; Reese, Phil. R.; Rice, C. B.; Rich, W. J.; Richards, F. B.; Robinson, Frederick; Robinson, H. A.; Roche, F. W.; Rogers, Greg; Roof, J. P.; Root, F. P.; Root, Walter S.; Russell, E. L.; Russell, G. R.; Rust, J. H.

Sackett, L. J.; Salen, Chas. P.; Salkeld, F. O.; Saltzman, R. J.; Sampliner, M. L.; Savage, Harry; Sawhill, J. E.; Sawyer, John P.; Sayle, W. F.; Scaife, Arthur J.; Schauwaker, Jos.; Schlother, L.; Schmidt, Chas.; Schmitt, A. G.; Schnatterbeck, B. E.; Schneerer, F.; Schroeder, W. C.; Schulkms, Frank; Schwarzkopf, E. E.; Scofield, F. R.; Scofield, Geo. F.; Scott, Walter J.; Sears, F. W.; Severance, John L.; Shanks, C. B.; Sheridan, H. K.; Sheridan, R. B.; Sherwin, Geo. N.; Shoenberg, L. D.; Sholes, F. T.; Shupe, Capt. H. P.; Shurmer, E. D.; Shurmer, W. H.; Sigler, Gilbert L.; Silver, Carl; Smith, A. H.; Smith, Arthur M.; Smith, C. T.; Smith, Geo. H. (Chillicothe, O.); Smith, Geo. H. (Phila., Pa.); Smith, J. S.; Smith, R. F.; Snider, H. M.; Snider, Warren; Somers, C. W.; Southworth, O. S.; Spalding, Chas. D.; Spangler, Robt. A.; Sparrow, J. C.; Sperry, I. B.; Spink, F. E.; Splittdorf, C. F.; Sprague, Jas. S.; Springsteen, E. M.; Stahl, H. A.; Stanton, R. F.; Staring, W. H.; Stearns, F. B.; Steenstrup, P. S.; Steese, Chas. J.; Stiverson, F. E.; Stoddard, C. G.; Stoer, H. W.; Stone, D. E.; Stone, L. A.; Straub, W. C.; Strong, E. L.; Strong, H. B.; Strong, W. D.; Swindeman, J. G.; Swinehart, B. C.

Talbot, W. S.; Taylor, Forrest E.; Taylor, John W.; Teagle, F. H.; Tehen, Theo. J.; Telling, W. E.; Thalheimer, H. S.; Thoipson, Arthur; Thoma, W. C.; Thompson, C. E.; Thompson, Eugene R.; Thompson, John; Tinan, Percy W.; Totman, W. W.; Tower, C. A.; Townsend, F. H.; Towson, Morris S.; Tozier, E. B.; Trask, J. C.; Tremaine, H. A.; Trombley, D. M.; Troxel, O. S.; Tucker, A. B.; Tucker, B. C.; Tucker, R. H.

Upstill, E. A.

Vail, Geo. L.; Vail, Harry L.; Van De Boe, J. S.; Van Sicklen, N. H.; Vinton, A. E.; Voak, Dr. A. F.; Vorce, Myron B.

Wade, J. H., Jr.; Wadsworth, Chas.; Wageman, W. J.; Wagner, Will H.; Waite, Geo. S.; Walker, W. T.; Wall, W. E.; Wardrop, Walter; Warner, A. P.; Warren, Chas. H.; Weaver, Chas. E.; Weaver, O. L.; Weed, A. H.; Weigle, Theo.; Weil, Arthur B.; Welch, H. J.; Weston, Frank; Weston, J. C.; Wetmore, R. C.; Wetzel, Thomas J.; Wherry, W. H.; Whitcomb, T. C.; White, Fred R.; White, W. B.; White, Walter C.; White, W. H.; White

Cleveland Automobile Club (Continued)

W. T.; White, Rollin H.; White, R. W.; Whitehead, W. C.; White, Henry W.; Wiess, Geo. L.; Wigmore, J. A.; Wilcox, E. C.; Williams, Ed. H.; Williams, E. M.; Williams, Wm. W.; Wills, A. J.; Wilson, W. G.; Winton, Alex.; Wise, Sam'l D.; Wolf, L. J.; Wolfram, C. J.; Wood, Harry B.; Wodward, O. J.; Work, B. S.; Work, F. W.; Worthington, Geo.; Worthington, G. C.; Wright, Carl F.; Wright, D. G.; Wylie, H. H.

York, Roy F.

Zurhorst, E. H.

FLORIDA EAST COAST AUTOMOBILE ASSOCIATION.

Adler, Louis; Adriance, W. A.; Allen, J. H.; Anderson, John; Armstrong, B. L.; Aster, J. J.; Atwood, Dr. E. C.; Aultman, M. B.

Ball, Col. W. F.; Bennet, Dr. P. R.; Bingham, C. M.; Blanchard, Isaac H.; Blodgett, W. E.; Blymyer, Geo. W.; Bond, R. M.; Bowden, H. L.; Breeze, Jas. L.; Brown, J. G.; Brown, L. M.; Brown, R. R.; Bryant, E. A.; Buffum, F. C.; Bullard, S. E.; Burgoyne, C. G.; Burgoyne, Mrs. C. G.; Burns, I. R.

Chamberlain, C. O.; Chandler, A. N.; Chapin, Mrs. E. W.; Christian, G. B.; Christie, Calvin M.; Christie, Walter; Christopher, J. A.; Clapp, F. S.; Clark, Geo. H.; Clark, Jas. H., Jr.; Clark, N. H.; Conquest, Charles; Conrad, E. T.; Conrad, F. N.; Conway, J. C.; Cordis, Thos. F.; Crouch, Geo. F.

Davidson, Mrs. F. M.; Dayton, Norman S.; Doerner, J. C.; Dumont, Fred T.

Emerson, Isaac E.; Esch, Dr. J. P.

Fitzgerald, T. E.; Flagler, Henry M.; Flynn, Chas. H.; Fogg, Chas. B.; Foote, Geo. H.; Foster, Major A. B.; Foster, I. W.

Gardiner, Chas. E.; Gardiner, Geo. H.; Gardiner, W. H.; Gates, Chas. G.; Gaugherty, Chris.; Goddard, F. G.; Godman, H. C.; Gould, Howard; Gove, S. H.; Greene, E. H. R.; Greenleaf, H. F.; Gugenheimer, Wm.

Hammond, John T.; Hankerson, R. A.; Hankins, W. M.; Hathaway, J. F.; Hendricks, J. A.; Hilliard, A.; Hoehne, H. H.; Houghton, Dr. F. H.; Howard, E. L.; Hughes, F. D.; Huston, M.

Jolley, J. M.;

Kettering, R. P.; Kling, A. H.; Knappe, Carl.

Florida East Coast (Continued)

Langworthy, E. D.; Laughlin, James; Laughrey, J. S.; Lewis, N. A.

Main, Frank H.; Maley, J. D.; Maley, R. S.; Mapes, E.; Massenat, A.; Miller, H. S.; Monroe, Geo. H.; Moore, J. B.; Moore, W. M.; Morgan, W. J.; Morris, J. D. C.; Morss, George; McCarthy; McConnell, Mrs. S. A.; McLaren, D.; McMurray, T. J.; McSpadden, J. C.

Nash, Will G.; Niver, F. J.

O'Boyle, J. F.

Paine, Asa; Parkinson, J. B.; Partridge, E. L.; Pierson, Dr. J. H.; Post, C. C.; Potter, E. L.; Price, John E.

Rawlings, Dr. J. E.; Rawson, Mrs. L. O.; Rhodes, Mrs. A. M.; Robidere, H. L.; Rogers, D. D.; Rogers, Frank; Roome, H. C.; Rose, E. D. W.

Schantz, Adam; Schmidt, A. H.; Schmidt, Henry; Sebring, Geo. E.; Seelye, Dr. H. H.; Sengstak, Theo.; Shaffner, W. M.; Shields, J. W.; Siems, Peter; Simms, Robt. W.; Smith, Geo. F.; Smith, L. O.; Snider, T. A.; Solliday, Col. A.; Stanley, Murray L.; Steck, Edward M.; Stevens, S. B.; Stewart, H. F.; Stillman, H. Y.

Thomas, E. R.; Thompson, H. C.; Thompson, L.; Thorpe, H. H.; Toensfeldt, J.; Turckheim, Baron Frederick de.

Vanderbilt, W. K.

Walbaum, Gottfried; Wells, A. W.; Whildin, Wilmon; Whinfield, R. W.; White, Edward; White, Thos. H.; Wilson, Mrs. E. P.; Wynn, James O.

Yarborough, H. B.; Young, Capt. C. A. Zapf, Joseph.

GENEVA (N. Y.) AUTOMOBILE CLUB.

Adamson, J. Louis; Anderson, C. W.

Bachman, C. C.; Baker, Daniel; Blaine, M. F.; Bloodgood, F. C.; Bowen, E. S.; Burrall, C. H.; Butler, W. H.; Buttery, H. J.

Chew, T. H.; Clapp, R. J.; Clarke, Walter A.

Dey, D. F.; Dilman, Fred; Dorman, D. M.

Earll, G. D.; Eddy, C. A.; Ellis, E. A. Fairfax, C. W.; Fairfax, G. S.; Fast, F. M.; Fitzwater, J. C.

Herendeen, F. W.; Howard, Walter.

Knickerbocker, Dr.

Lewis, Alfred G.; Lyttle, Dr.

Maney, M. J.; Marshall, Harry D.; McCaw, Dr. W.; McKane, S. G.; Means, Dr. Geo. S.; Monogal, Geo.; Munger, W. O.

Neider, Dr.

Place, J. A.

Geneva (N. Y.) Automobile Club (Con.)

Reuter, Henry; Root, C. J.; Rose, Hugh L.
Schefflein, H. H.; Skinner, Dr.; Spengler, Dr. J. A.; Stewart, F. G.
Truslow, T. H.; Tucker, B. M.
Vail, Louis M.

JANESVILLE (WIS.) AUTOMOBILE CLUB.

Barlow, R. H.; Bliss, H. H.; Brown, E. T.; Beers, Clarence; Blodgett, F. H.
Carle, Norman; Clark, C. C.; Chittenden, Dr. G.
Decker, George; Dodd, W. A.
Edden, Dr. R. W.
Harris, A. J.; Howe, Fred; Homes, D. W.
Jones, A. J.
Lovejoy, Allen.
Osburn, R. N.
Palmer, Bernhard; Parker, Geo. A.; Powell, Dr. R. R.; Palmer, W. F.; Parker, George S.
Randall, F. C.
Spencer, H. M.

MILWAUKEE (WIS.) AUTOMOBILE CLUB.

Allis, Charles; Allis, Louis.
Bacon, F. R.; Bates, Robert G.; Berenthal, August; Bolens, Harry; Brenckle, A. C.; Best, Fred C.; Brown, R. B.; Baird, J. C.; Becker, Sherburn M.; Berthelet, J. R.; Bossert, G. Frederick; Best, A. C.; Birkel, Dr. John A.

Cremer, George A.; Cutler, H. H.; Curtis, F. G.

Danielson, D. B.; Dittmer, Oscar H.; Drake, Clarke S.; Drought, Thomas M.; DeWolf, John E.; Discher, G. F.; Doepeke, Fred.; Drought, James T.; Dearholt, Lee A.; Durr, Dr. W. E.

Eastman, George S.; Elmergreen, Dr. Ralph; Eckstein, Arthur F.; Engel, August.

Farber, J. E.; Forgeot, George C.; Frentzel, H. E.; Fishedick, Oscar F.; Fisher, Dr. J. W.; Foster, J. W.; Fuldner, Dr. Louis.

Gesser, John; Golley, Dr. F. B.; Grau, Phil A.; Glass, S. J.; Golder, C. E.; Grau, A. M.; Greenwald, O.

Haase, C. L., Jr.; Hamilton, George W.; Hayssen, Robert G.; Herwig, Fred L.; Hoffmann, O. A.; Huseby, Geo. G.; Haefner, Wm. E.; Hathaway, Allen S.; Hase, Chas. F.; Hoeffler, A.; Hulst, Dr. N. P.

Katz, Herman; Kopmeier, Norman J.; Kipp, B. A.; Koss, Herman T.

Milwaukee Automobile Club (Cont.)

Ladewig, J. C.; Larsen, Edward; Leverenz, E. B.; Lonstorf, George; Landauer, Harry; Leidersdorf, C. B.; Lindsay, William.

Mackie, Dr. William; Mariner, John W.; Meisenheimer, Rudolph; Milzer, Charles; Mokros, Richard F.; Mann, Frank J.; Mayer, George P.; Milbrath, A. F.; Moeller, Dr. A.; Moore, M. C.

Nicholson, I. L., Jr.; Norris, C. W.; Niedecken, E. F.; Newell, Dr. I. O.

Pabst, Gustave; Pfingsen, John H.; Pipkorn, W. H.; Prescott, Fred M.; Petit, L. J.; Pfister, Charles F.; Potter, J. L.; Prinz, Faustin.

Rice, Henry H.; Roehr, Julius E.; Russell, George H.; Rock, Dr. J. N.; Rugee, F. P.; Reutemann, John G.

Schandein, Emil; Scholtka, C.; Schroeder, Walter; Schweitzer, Stephan; Sherman, Dr. Lewis; Siwyer, Frederick W.; Solliday, A. F.; Stanz, H. B.; Szukalski, Rev. J. F.; Schneider, Dr. A.; Schroeder, Edward; Schwartzburg, E. H.; Shattuck, A. W.; Sherman, W. S.; Smith, A. O.; Stehling, Charles; Stern, Walter.

Teschan, Dr. R. F.; Trostel, Albert O.; Toepfer, Charles; Trostel, Gustav.

Uihlein, W. B.

Viets, H. A.

Wagner, R. G.; Warnke, E. H.; Welch, Gail; West, George A.; Wahl, Dr. Emil; Welch, Charles A.; Welch, Wm.; Wilbur, F. P.

Zummach, A. H.

MOTOR CLUB OF HARRISBURG, PA.

Aldrich, J. C.; Asrich, Herman.

Baker, Howard W.; Bayard, J. S.; Bell, Jas. A.; Benfer, J. H.; Biszantz, F.; Black, Geo. W.; Blacker, Geo.; Blessley, J. W.; Blough, B. F.; Blough, W. R.; Boll, Chas. S.; Bolton, L. U.; Bowman, T. E.; Brady, Frank J.; Brant, Elmer G.; Bunn, Jas. A.; Buvinger, R. R.; Bux, Chas. S.

Case, E. Wallace; Chamberlain, A.; Coart, J. H.; Cocklin, C. C.; Cumbler, C. C.; Cumbler, H. M.

Dechant, Jacob; Dill, I. W.; Dodge, Geo. U.; Doehne, Geo. L.; Dull, D. M.; Dwyer, M. E.

Eckenrode, Joe O.

Fairman, C. C.; Faunce, L. A.

Gantert, G. Hilton; Gettys, M. H.; Gilbert, C. A.; Godcharles, F. A.; Grant, H. A.; Graupner, Max. R.; Greenawalt, C. F.; Crispen, C. C.

Motor Club of Harrisburg (Cont.)

Hagerling, R. H.; Hahn, H. F.; Halde-
man, D. C.; Haldeman, R. C.; Ham-
burger, S. K.; Hart, C. V.; Hickok, W.
O., 3rd; Holmes, Harry L.

Irvin, E. G.

Jenkins, H. W.; Jones, A. A.; John-
ston, Lewis E.; Johnston, R. H.

Keeney, Fred E.; Kline, Jas.

Lebo, E. N.; Leinbach, Edw. L.

Markley, E. C.; Marks, E. S.; McCor-
mick, Jas., Jr.; McCormick, Vance C.;
McFarland, Geo. G.; McKee, E. C.;
Meals, E. S.; Messner, Daul D.; Miller,
E. J.; Murphy, J.; Myton, J. Clyde.

Nissley, Christ G.; Nissley, Jno. C.

Oenslager, Frank; Oenslager, Jno.

Rawll, H. F.; Redmond, And.; Reese,
Jas. N.; Rhodes, C. M.; Riggie, W. H.;
Roberts, W. H.; Robertson, O. C.; Rudy,
Jno. M.

Schade, Herman; Sefton, C. A.; Sellers,
Jno. E.; Senseman, R. H.; Shirk, Robt.;
Sible, J. Sidney; Sible, J. S.; Simmonetti,
H. R.; Starry, W. G.; Stees, Frank A.

Thorley, Samuel E.; Trego, Jas. S.;
Turner, Chas. P.

Vandegrift, W. G.

Waters, E. H.; Weidman, S. B.; Weir-
ich, J. L.; White, Walter C.; Wildman,
Aug., 3rd; Wensell, Jno. C.; Wright, H.
C.

Young, H. B.

Zimmerman, H. G.

**NEW JERSEY AUTOMOBILE AND
MOTOR CLUB.**

ACTIVE MEMBERS.

Abercrombie, D. T.; Adams, E. W.;
Aiken, E. L.; Albright, A., Jr.; Alexan-
der, A.; Allan, A. R.; Allsopp, G. A.;
Angell, J. T.; Appleby, R. W.; Asher,
Dr. M.; Atwood, G. B.; Austin, H. N.

Bailey, S. F.; Bailey, S. G.; Baker, C.
O.; Baker, C. W.; Baker, W. A.; Bal-
bach, E., Jr.; Baldwin, C. R.; Baldwin,
W. A.; Ball, A., Jr.; Bardsley, W.; Bar-
num, H. C.; Bartley, J.; Beach, C. E.;
Beattie, R., Jr.; Becker, C. A.; Belding,
M. M., Jr.; Belden, H. F.; Bell, G. R.;
Bell, Dr. J. F.; Bell, J. S.; Bellis, J. W.;
Bellman, E. R.; Benedict, H. R.; Ben-
isch, M.; Benson, F. G.; Bent, S.; Beucke,
Aug.; Beucke, Aug., Jr.; Bird, E. D.; Bir-
kenmeier, A.; Bissell, C. H.; Bittles, W.;
Blair, C. Ledyard; Blair, J. I.; Blanch-
ard, I. H.; Blanchard, T. C. E.; Boerger,
E.; Boland, F. E.; Bond, C. E.; Bonnell,
H. A.; Bonykamper, J. F.; Bowden, F.;
Bowden, J. H., Jr.; Bowers, P. J.; Bow-

New Jersey Auto and Motor Club (Con.)

man, H. D.; Boyd, C. F.; Boyer, F. W.;
Brady, J. B.; Brientnall, R. H.; Brink,
F. S.; Brodie, W. H.; Bromfield, J. R.;
Bromley, J. H., Jr.; Brooke, H. L.;
Brooks, E.; Brown, G. G.; Brown, J. M.;
Brown, W. H.; Browne, S.; Bruckner,
Dr. C. H.; Brunner, A. N.; Buehler, W.
J.; Buhl, F.; Buhler, W.; Burn, W. H.;
Burns, E. F.; Burns, Dr. E. L.; Bush,
E. A.; Bush, H.; Bushfield, W. A.;
Byrne, J. M.

Calvert, C. S.; Callaway, W. T.; Cam-
meyer, A. J.; Campbell, L. A.; Canda,
C. J.; Carey, Jos. F.; Carter, R. D.; Case,
S. W.; Chamberlain, A. H.; Chapman,
C. B.; Chapman, H. S.; Chesebrough,
A.; Childs, J. E.; Chilver, Edward A.;
Christopher, W. R.; Clark, N. F.; Clark,
W. C.; Clawson, C. C.; Close, J.; Colby,
E. A.; Cole, George T.; Coles, W. C.;
Coleman, H.; Coleman, J. C.; Connett,
E. V., Jr.; Cook, DeWitt, Jr.; Cook, Geo.
Dillwyn; Cook, Dr. H. F.; Cook, H. P.;
Cook, P. A.; Cooper, C. S.; Corbett, E.
M.; Crane, W. W.; Crickenberger, C.;
Crosby, W. C.; Crosel mire, C. F.;
Crosel mire, F. A.; Cross, G. W.; Cullen,
W. A.; Cumbach, R. O.; Curtis, F. T.;
Curtis, W. H.; Cutter, H.

Dalrymple, A. N.; Davis, E. T.; Davi-
son, B. D.; Dawson, J. H.; Decker, H.;
DeMars, W.; Denman, I. R.; Dennis, Dr.
J.; Dennis, L. W.; Derby, C. F.; Dey,
W. P.; Dexheimer, J. P.; Dickinson, J.;
Dilworth, W. S.; Dodd, A.; Dodd, A. T.;
Donaldson, A. C.; Donohoe, Dr. L. F.;
Doremus, A. E.; Dorland, L. W.; Doty,
C. W.; Douglass, R. D.; Drake, N.;
Drener, E. A.; Drexel, G. W. C.; Driver,
F. L.; Drumpelmann, W. J.; Dryden, F.
F.; Duffy, W. A.; Duncan, J. H.; Dun-
ham, H. N.; Duren, G. E.; Du Pont, A. I.

Easton, E. D.; Eastwood, E. L.;
Eaton, F. W.; Eberhardt, H. E.; Eck,
C. A.; Eckert, J.; Edison, T. A.; Ed-
wards, J. H.; Eisele, A. N.; Ellis, W. H.;
Emerson, I. E.; Engelbrecht, F.; Eng-
lish, Dr. J. R.; Everitt, J. K.; Eyerman, J.

Fahnestock, W. G.; Feick, C. A.;
Feigenspan, C. W.; Ferguson, W. L., Jr.;
Fewsmith, Dr. J.; Fincke, B. C.; Fischer,
H.; Fisher, C. E.; Fisk, W. I.; Flemer,
W.; Fleming, A.; Flock, F. M.; Floresch,
P. F.; Floyd, E. D.; Foley, D. W.; Foley,
E. J.; Ford, W. H.; Foster, H. C.; Fos-
ter, R. D.; Fowler, P. H.; Francis, A.
W.; Frank, L. M.; Friedlander, W. S.;
Frisbee, L. W.; Fritz, G. H.; Fuld, F.;
Fulper, W. H.; Furber, J. B.

Gardner, Dr. D. M.; Gardner, Dr. E.
W.; Gage, Dr. R. S.; Garreaud, G. C.;
Gates, C. G.; Gay, H. S.; Gay, J. H.;
Geissel, C. P.; Geissler, J. W.; Gent, P.

New Jersey Auto and Motor Club (Con.)

W.; Ghegan, John J.; Gillam, R. E.; Gillette, P. F.; Glasby, J. F.; Glück, J. D.; Good, R. C.; Goldsmith, M. H.; Gore, J. K.; Gould, T. P.; Graham, O. R.; Grant, H. J.; Graves, E. H.; Gray, E.; Green, L.; Greene, R. A.; Grover, W. S.; Griffith, E. G.; Groebe, G. O.; Guigues, A. A.

Haas, J. F.; Hagerman, S. G.; Hagerty, Dr. J. F.; Haines, H. B.; Hall, F.; Hall, G. E.; Hall, P. E.; Halsted, Capt. C. S.; Hanna, J. B.; Hardman, J.; Harris, Dr. H. C.; Harris, L. B.; Harrison, L.; Hart, C. N.; Hart, Dr. H. M.; Hart, Mrs. P. H.; Harvey, George; Hasselman, F. R.; Haslam, A.; Huassling, M. H.; Havens, A. G.; Hayden, F. B.; Hayman, A.; Headley, A. O.; Heckel, C. O.; Heckel, E. H.; Heisler, J.; Heitmeyer, R. T.; Heller, A. G.; Heller, P. E.; Heller, R. A.; Henke, W. O.; Henry, C. C.; Hensler, J. R.; Hepburn, H. L.; Hesters, H. F.; Hetzmann, F. B.; Heyer, A. P.; Hill, E. C.; Hines, J. N.; Hinni, F. C.; Hoag, C. R.; Hoagland, R.; Hoagland, S. C.; Hoff, J. B.; Hoffmann, Dr. G. P.; Holmes, Dr. C. B.; Howe, C. E.; Howell, J. W.; Howell, W. E.; Huebel, J.; Huggins, E. N.; Hull, M. O. C.; Humphreville, A. H.; Hunt, L. R.; Hunt, W. H.; Hunter, C. W.; Huntington, A. M.; Hurd, B. F.; Hurlburt, W. B.; Hussey, F.; Hyde, F. de L.

Ill, Dr. E. J.; Isetts, W. E.

Jackel, G. W.; Jacobs, G. H.; Jacoby, Dr. G. W.; Jaeger, G. A.; James, A. C.; Jamison, Miss M. A.; Jenkinson, R. C.; Johnston, F. H.; Johnston, P. H.; Joo, R. S.

Kastner, T. A.; Kelley, E.; Kelsey, R. G.; Konney, D. T.; Kent, W.; Kerr, R. C.; Kessler, G. A.; Kiefer, A. O.; Kimball, W. L.; Kimber, W. F.; King, B.; King, G. F.; Kinney, W. B.; Kinsey, J. R.; Kirch, E. A.; Kirkpatrick, A.; Knott, W. W.; Koch, W. A.; Kocher, C. F.; Koehler, H. J.; Kohn, E. P.; Kohn, O. W.; Krebs, C.; Krementz, F. J.; Krementz, T. H.

Laisant, F. R.; Lambert, A.; Lamme, A. J.; Laval, C. G. de; Lawrence, L.; Lea, T.; Leavitt, G. O.; Lebkuecher, J. A.; Lehberger, G.; Lehman, A. O.; Le Massena, A. B.; Leonard, F. A.; Levey, C. B.; Lichtenfels, R.; Linkroum, W. H.; Livingston, J. W.; Loehnberg, A. B.; Logan, A. S.; Lloyd, W. B.; Loomis, G.; Long, G. E.; Long, Dr. H. W.; Loppacker, A.; Lord, A. W.; Lowry, O.; Luehman, A. T.

Macdonald, J.; Macksey, T. F.; March, S. B.; Martin, F. L. C.; Mason, J. W.;

New Jersey Auto and Motor Club (Con.)

Mead, Dr. Sarah R.; Meeker, Dr. F. B.; Mehl, H.; Merrick, C.; Mertz, E. C.; Mertz, T. C.; Merz, A.; Metcalf, M. B.; Meyer, H. T.; Meyer, J. J.; Meyer, L.; Miller, H. S.; Miller, L. B.; Miller, W. H.; Mills, D. B.; Mitchell, Dr. A.; Morgan, C.; Morgan, W. J.; Moore, C. F.; Moore, Elwood W., Jr.; Moore, S. L.; Morris, Dr. C.; Morris, G. E.; Morton, C. M.; Motzenbecker, Dr. P. F.; Murphy, F., Jr.; Murray, Dr. E. W.; Murray, P.; Murray, W.; McCabe, E. F.; McCarter, W. H.; McClellan, G. B.; McCormick, E. H.; McDede, W. J.; McEwan, R. B.; McKenzie, B. D.; McKenzie, K. M.; McKim, W. J. A.; McLaren, Thayer.

Nash, Dr. A. B.; Nesbit, F. T.; Newall, E. G.; Niblette, H. B.; Nichols, C. K.; Noe, W. R.; Noling, I. O.; Noll, J. F.

Oathout, C. W.; Ogden, F. H.; Olcott, D., 2d; Oliver, E. S.; Oppenheim, M. H.; Orcutt, C. B.; Osborn, J. E.; Osborne, A. D.; Ostrander, F. A.; Ott, L. F.

Paddock, G.; Painter, P.; Parker, J. H.; Parker, H. L.; Parkhurst, E. D.; Paulson, L.; Pearce, F. E.; Pearson, W. W.; Peckworth, C. H.; Pennington, L.; Peterson, A.; Phelps, A.; Phelps, F. A.; Phelps, Capt. J. J.; Phillips, J. B.; Phoenix, W. N.; Pierson, D., Jr.; Pionnie, A. J. P.; Plum, W. T.; Potts, F. L.; Powell, G. H.; Pratt, F. R.; Preston, T. J.; Price, F. V., Jr.; Priessing, G. W.; Prince, Prof. J. D.; Prince, W. F.; Pritchard, J. T.; Proal, A. B.; Pursell, A. T.; Pye, J. E.

Quivey, Dr. W.

Radel, J. J.; Randolph, I. F.; Reed, S. L.; Reeve, F. C.; Reid, H.; Reimund, B. F.; Reinberg, G.; Reusch, E. E.; Reynolds, Dewitt C.; Reynolds, W. H.; Rice, W. J.; Richert, B. W.; Richman, Dr. E. M.; Rickey, Mrs. M. H.; Rinehart, B. L.; Rively, Dr. C. R.; Robertson, Dr. S. E.; Robbins, H. P.; Rosinger, A. W.; Ross, L. H.; Rothermel, P. F.; Rowe, C. T. B.; Ruesch, H. J.; Rushmore, R.; Rushmore, T.; Ryall, J. B.

San Giacomo, T. S.; Sargeant, E. E.; Schaeffer, F. A.; Schafer, F.; Schaeffler, Dr. W. G.; Scheffer, F. A.; Scheppach, Dr. H. A.; Scherer, A. G.; Schmadeke, J. F.; Schmidt, R. B.; Schmitz, F.; Schneider, Dr. C. A.; Schroeder, F.; Schultz, B. V. H.; Schuetz, H. C.; Schuler, A. W.; Seidler, Dr. W. F.; Seiler, C. E., Jr.; Seeley, A. M.; Seitz, E. Z.; Seitz, F. A.; Setlow, H.; Shanley, B. M., Jr.; Shanley, J. Roosevelt; Shanley, W. C.; Sharpe, J.; Shepherd, G.; Sheppard, W. S.; Simonds, G. H.; Sinclair, A.; Singer, P. A.; Siocomb, E. M.; Smith, A. L.; Smith, C. H.; Smith, C.

New Jersey Auto and Motor Club (Con.)

W.; Smith, G. C.; Smith, H. C.; Smith, J. T.; Smith, W. C.; Smith, W. McC.; Sneed, C. S.; Snyder, H.; Snyder, W. V., Jr.; Soden, G. W.; Sommer, F. N.; Sommer, W. M.; Somerville, J. M.; Spinning, G. H.; Spooner, F. Ed.; Staehle, L. L.; Stage, J. S.; Starrett, P.; Stearns, W. E.; Steenstrup, P. S.; Steindler, E.; Stemmler, T. W.; Stengel, C. E. H.; Stevens, J. P.; Stevens, Richard; Stewart, J. W.; Stiles, F. W. T.; Stoddard, T. A.; Stone, F. G.; Strasser, Dr. A. A.; Straus, A.; Straus, B. W.; Straus, L.; Strauss, I. T.; Strauss, J. D.; Suffern, H. W.; Sutton, F. M.; Sutton, F. S.; Squier, F. C.; Squire, G. A.; Squier, Dr. M. F.

Taylor, Dr. J. L.; Taylor, S. B.; Teaboldt, C. R.; Tegen, F. H.; Terrell, H. L.; Terry, T. L.; Thacher, F. W.; Thayer, H. W.; Thomas, E. R.; Thomas, G. L.; Thomas, H. M.; Tompkins, E. E.; Thompson, G. L.; Thompson, L. S.; Thomsen, H. A.; Thorne, H. B.; Thornton, G. M.; Tichenor, H. T.; Titus, Fred. J.; Tonking, J. B.; Towne, E. B., Jr.; Townsend, G. B.; Trimpi, W. W.; Trowbridge, W. H.; Turnbull, F. S.; Turner, J.; Twinch, S. A.

Uebelacker, C. F.; Underhill, H. I.; Underwood, C. R.; Uppercu, I. M.

Valentine, H.; Vander Beek, F. J., Jr.; Van Buren, Mrs. E. M.; Van Gieson, Dr. R. B.; Van Orden, J. M.; Van Vleck, C. E.; Van Vleck, W. D.; Van Winkle, A.; Virtue, W. E.; Voorhees, G. P.; Voorhees, L. A.; Vreeland, J. H.; Vreeland, W. H.

Wadsworth, F.; Walters, G.; Walters, G. H.; Wassermann, E.; Warburg, F. M.; Ward, Arthur B.; Ward, E. G.; Ward, H. C.; Ward, J. W.; Ward, L. P.; Ward, N. J.; Ward, R. S.; Wardell, G. W.; Warren, F. R.; Webner, Dr. F.; Weeks, B. S.; Weeks, J. H.; Weir, R. W.; Welcher, Dr. H. A.; Weller, C.; Weller, W.; Wells, C. S.; Werner, G. H.; Westenfelter, P., Jr.; Westervelt, C. A.; Weston, E.; Wheaton, L. S.; Whitehead, B. S.; Whiteman, J.; Widmann, Dr. A. V.; Willey, C. S.; Williams, S. M.; Wilson, A. J.; Wilson, P. R.; Wilson, S. F.; Wing, L. J.; Wiss, F. C. J.; Wiss, L. T.; Wood, E. F.; Wood, J. H.; Wood, W.; Woodman, J. H.; Woerz, E. G. W.; Woolsey, J. B.; Wright, L., Jr.; Wright, W. D. Craig; Wurth, A. F.; Wurth, L. J.; Wyckoff, L. J.

Young, A. F.; Young, J. M.

Zeller, G. O.; Zusi, E.; Zusi, E. A.; Zusi, L. B.

New Jersey Auto and Motor Club (Con.)
ASSOCIATE MEMBERS.

Abeel, N.; Adams, W.; Agens, Col. F. G.; Agens, F. G., Jr.; Aikman, W. M.; Anthony, W. R.

Baright, G. F.; Barker, W. J.; Bartow, G. C.; Bell, C. N.; Berla, S.; Bond, H. R., Jr.; Bonnell, C. I.; Brock, E. S.; Burnett, W. A.

Campbell, E. A.; Cannon, C. I.; Carhuff, F. P.; Carr, R. B.; Carpenter, C. M.; Charbonneau, Dr. E. G.; Christl, H. O.; Coats, W. G.; Coghlan, W. J.; Conklin, L. H.; Conroy, J. F.; Conti, C.; Cooper, W. L.; Crabb, D. M.; Crane, E. W.

Delany, J. M.; Dey, L. G.; Dodd, C. F.; Dodd, C. S.; Dougher, M. A.; Drake, M. S., Jr.; Duren, W. A.; Duryee, E. N.

Elcox, W. H.; Ely, J. H.; Emanuel, J. F.; Evell, J. L., Jr.

Feibleman, J. L.; Fischer, M. J.; Fredericks, E. H.

Gillatly, F. E.; Good, H. B.; Gray, E. W.; Gray, G. R.; Gregory, W. H.; Grice, H. C.

Hall, W. A.; Halsey, G. E.; Haney, C. A.; Helm, J. E.; Hetzel, C. E.; Holbrook, Dr. C. W. F.; Hunt, F.; Hunt, W. T.; Husk, T. S.

Illingworth, W. H.

Jackson, C. H.; Jackson, O. W.; Jacobus, W. M.; Jones, H. P.

Keer, T. F.; Kirkpatrick, L.; Knight, H. W.

Lanier, J. F.; Lebkuecher, C. H.; Lee, W. A.; Lehman, I.; Leiss, J. N.; Lipton, W. T.; Logan, J. P.; Lum, R. E.

Marshall, H. A.; Mason, J. L.; Mayes, F. W.; McClave, W. P.; McDougall, H. C.; McFadden, J. P.; McGuire, J. J.; McManus, W. A.; McWhiney, L. T.; Metzger, A. R.; Miller, C. H.; Mitchell, A. H.; Montgomery, M. J.; Morrison, G. F.; Munn, J. L.

Nieder, J.; Nobs, C., Jr.

Osborne, W. H.

Page, A. D.; Parker, C., Jr.; Perry, C. E.; Pfeil, C. L.; Pollard, C. W.; Pratt, T. D.

Radcliffe, W.; Reibenstein, F.; Reid, A. S.; Richards, G. M.; Richardson, H. W.; Riker, C.; Robb, J. T.; Roseno, L.; Ross, P. S.; Royal, B. G.

Sanderson, J. M.; Sargeant, S. H.; Sargent, C. L.; Schenck, E., Jr.; Schied, C.; Schober, A. F.; Schrafft, A.; Schwarzkopf, J. G.; Schwinn, F.; Shack-

New Jersey Auto and Motor Club (Con.)
leton, J. H.; Shields, W.; Shover, F. T.;
Smith, I.; Smith, W. A.; Sturr, S. K.;
Swain, G. R.

Tatham, G. E.; Taylor, E. St. John;
Taylor, G. A.
Virtue, F.

Ward, C. B.; Weil, J.; Wells, C. A.;
Whiting, A. H.; Williams, A. B.; Wil-
liams, W.; Wrightson, J.

Yocum, J.; Young, H., Jr.; Young, Dr.
J. C.

NEW YORK AUTOMOBILE CLUB.

Baldwin, Louis C.; Balfe, Harry; Bow-
man, Sidney B.

Chave, William G.; Church, Charles T.;
Churchman, Edwin; Cobe, Andrew J.;
Connell, J. Harvey; Covell, C. H.; Covell,
C. Hubert.

Daniels, Frank H.; Day, Henry M.; De
Lisser, Horace; Dwight, John E.

Fairfax, Harry W.; Faulhaber, Bert. G.;
Fenker, R. H.; Flint, Austin, Jr.

Goddman, David C.; Gourand, Jackson;
Gray, James H.; Grossman, M. H.

Haupt, Harry S.

Jeffries, F. M.

Kaufman, Gustave.

Langford, T. H.; Leggett, J. A.

Marquand, Frederick F.; Marvin, David
M.; Melies, Gaston; Mesquita, J. Bueno
de; Munger, A.; McCarthy, Thos. M.

Ostrander, Frank.

Partridge, E. S.; Pease, Henry Hollister.

Quinn, W. Johnson.

Reynolds, Hon. Wm. H.; Roskam, I. Ed-
ward.

Sanders, Leslie B.; Simpson, John Boul-
ton; Snow, Elbridge G.; Snyder, W. F.;
Sour, Bernard; Stanton, J. R.; Steindler,
Edward; Steinfeld, Samuel; Steinfeld, Leo.

Trageser, W. C.

Untermyer, Maurice.

Van Santvoord, R.

Walker, Wm. I.; Weed, Edgar T.; Wein-
garten, O.; Weingarten, David; Welzml-
ler, Louis R.; Williams, Percy G.; Wood,
Benj.; Wood, Howard B.; Woodward,
George B.; Wright, G. A.; Wright, M. G.

OSHKOSH (WIS.) AUTOMOBILE CLUB.

Albee, Dr. E. S.

Clark, Dr. Burton; Crum, Dr. J. A.

Hay, Mrs. Philip; Hollister, P. W.; Hol-
lister, S. W.; Hollister, Carl; Hollister,
Rex.

Oshkosh (Wis.) Automobile Club (Con.)

Josslyn, C. O.; Josslyn, F. H.

Krueger, Edward.

Maxcy, W. G.

Radford, C. W.

Sawyer, E. P.; Schmidt, J. F. W.; Stock-
ing, Ellsworth; Sawyer, P. H.; Smith, W.
H.

Thompson, A. E.; Titus Dr. W. H.

Waite, F. E.; Wall, T. R.

PORTAGE (WIS.) AUTOMOBILE CLUB.

Barker, A. R.; Bremner, Geo.; Barker,
G. H.

Coxtall, E. E.

Gowran, E. A.; Gowran, James.

Jones, A. W.

Kellogg, J. R.

Parry, W. H.

Stroud, W. S.

Weir, Andrew; Wright, Edward T.;
Wright, E. J. S.

ROCHESTER (N. Y.) AUTOMO- BILE CLUB.

Adams, G. R.; Adler, Max A.; Adler,
M. S.; Aldridge, Geo. W.; Allen, D. H.;
Allen, Innis P.; Alling, J. T.; Angle, C.
E.; Anstice, Josiah; Anthony, B. E.;
Armstring, W. B.; Atkinson, Geo.

Babcock, A. E.; Babcock, C. H.; Bad-
ger, R. A.; Barhite, J. A.; Barker, Thos.
A.; Barry, Wm. C., Jr.; Bauer, J.;
Bausch, Wm.; Baxendale, T. R.; Baxter,
F. R.; Beach, F. H.; Becker, A. L.;
Becker, Willard D.; Beckley, W. R.;
Beir, E. J.; Berkman, Dr. J. S.; Bettys,
F. H.; Bingeman, J. S.; Birdsall, E. T.;
Bissell, W. W.; Bonbright, G. D. B.;
Booth, F. A.; Bourne, John R.; Bown,
W. W.; Brewster, E. Frank; Brewster,
E. Franklin, Jr.; Brewster, S. E.; Brey-
fogle, John W.; Briggs, W. H.; Bristol,
M. C.; Brown, Le Grand; Brownell, F.
A.; Burke, J. J. A.; Burns, Chas. F.;
Burritt, S. D.; Burrows, Lorenzo; Butts,
J. DeWitt.

Camp, C. D.; Campbell, E. C.; Camp-
bell, W. H.; Cargill, B. D.; Castle, Wil-
mot; Chapin, Chas. T.; Christman,
Philip; Church, F. F.; Clark, Chas. H.;
Clark, Geo. H.; Clum, Philip A.; Cobb,
Amos H.; Colebrook, A. S.; Collins, N.
M.; Conboy, J. Conboy; Connors, M. S.;
Cook, J. W.; Cooper, D. M.; Craig, W.
H.; Crittenden, A. F.; Cronise, Adelbert;
Crosby, Geo. N.; Cross, F. J.; Curtice,
E. N.; Cutler, J. G.; Cutler, J. W.

Dake, W. W.; Danforth, H. G.; Davies,
K. M.; Davis, Ora W.; Demerath, Jo-
seph; Dewey, A. H.; DeWitt, Owen D.;
De Vine, Thos.; DeZutter, Chas. I.;

Rochester Automobile Club (Continued)

Doud, Dennis; Dunn, Bernard T.; Durand, John E.

Eastman, Geo.; Eichler, Chas. H.; Elliott, L. B.; Ellwanger, W. D.; Elsner, S. L.; Elston, H. K.; Elwood, C. A.; Erbe, Gustave; Everett, B. S.

Faber, J. P.; Falls, Frank H.; Farley, J. A.; Fenn, Albert O.; Fenn, B. W.; Finnessey, James H.; Finucane, J. J.; Finucane, T. R.; Finucane, T. W.; Fisher, Chas. F.; Fisher Furniture Co., I. J.; Force, J. W.; Ford, R. T.; Foster, G. G.; Foucher; Fredericks, W. C.; Freeman, W. N.; Fritz, A. R.; Fryne, J. J.; Fuller, G. R.; Furlong, H. M.

Garfield, C. F.; Garfield, H. H.; Garlock, C. J.; Gilbert, Dr. G. B.; Gilbert, Dr. L. H.; Gleason, James E.; Griffith, Harrie; Gordon, Geo.; Gosline, Richard; Graham, C. T.; Graham, Harry S.; Graham, W. J.; Graves, F. B.; Graves, J. W.; Green, Chas. B.; Green, Marvin H.; Griesheimer, F. Maurice; Griffith, F. W.; Guernsey, E. B.

Hagen, R. A.; Hale, Geo. D.; Hamilton, R. A.; Hart, A. Vernon; Hartson, C. F.; Hastings, Herbert; Hatch, G. E.; Hayes, Edward G.; Heberger, John; Henkell, Dr. A. W.; Hevenor, H. H.; Hibbard, W. W.; Holcombe, Chester F.; Hollen, A. M.; Hollister, G. A.; Holtz, M. L.; Hone, A. K.; Hotchkiss, J. L.; Hough, A. G.; Howe, J. Henry; Hubbard, W. A., Jr.; Hutchinson, Geo. F.

Ingersoll, J. M., M.D.; Ingmire, G. W.

Jobs, E. P.; Johnston, H. P.; Johnston, T. S.; Jones, Dr. O. E.; Judson, Chas. B.; Judson, C. H.

Kaelber, J. C.; Keegan, Dr. W. A.; Kellogg, R. D.; Kelly, Frank X.; Kelso, J. E.; Kershner, R. C.; Keyes, Geo. J.; Kirby, Thos.; Kirkpatrick, G. W.; Knapp, Homer; Knapp, M. D.; Koch, Geo., Jr.; Kochenthal, Marcus; Kraft, Victor L.

Lane, William A.; Langslow, Harry R.; Lapp, E. H.; Lauer, F. C.; Leach, A. R.; Lee, J. M.; Likly, W. C.; Lindsay, A. M., Jr.; Locklin, J. V.; Loeffler, Fred H.; Loewer, Henry F.; Lomb, Carl F.; Long, Adam A.

Mabbett, F. A.; Magee, Geo. J.; Mahon, A. J.; Maize, F. P.; Maloney, F. W.; Mandery, J. J.; Marchand, L. J.; Maselli, F. A.; Mason, A. F.; Mason, F. E.; Matthews, W. H.; May, A. E.; Meade, C. E.; Meng, A. A.; Merchant, G. E.; Miller, A. J.; Miller, Geo. B.; Miller, James T.; Miller, Wm. F.; Mock, J. E.; Mooney, T. T.; Moore, A. G.; Moore, R. M.; Moore, W. H.; Mora, S. H.; Morey, J. E.; Morse, Chas. C.; Morse,

Rochester Automobile Club (Continued)

John P.; Morse, W. S.; Mosher, G. E.; Motley, Geo.; Mulligan, Wesley; MacDonell, August M.; McCall, Arthur H.; McConnell, John S.; McGreal, John J.; McInerney, John J.; McInnerney, Thos. H.; McLaughlin, Geo. J.; McLaughlin, J. L.; McMillen, N. F.; McMullen, F. E.; McNall, Arthur.

Naylon, W. J.; Noeth, Geo. E.; Northway, T. J.; Nusbickel, John S.

Ocuppaugh, C. H.; Odenbach, Fred; Osborn, Emory W.; Ozmun, I. D.

Palmer, C. H.; Palmer, Griff D.; Parkhurst, L. A.; Parson, Thos.; Pembroke, C. J.; Perkins, Walter B.; Pond, N. P.; Porter, C. S.; Porter, H. J.; Potter, Chas.; Powell, Mark F.; Powers, J. C.; Powers, W. W.; Present, Phillip; Pritchard, A. R.

Randall, R. R.; Rapp, F. H.; Rauber, John N.; Reed, C. D.; Richards, D. M.; Richmond, Lee; Roberts, Harry R.; Robeson, R. H.; Rockwood, A. J.; Rogers, Clinton; Rolfe, Carl D.; Rollins, J. Herbert; Ross, L. P.; Roth, Geo. F.; Rush, J. K.; Russell, F. D.

Saegmuller, Geo. N.; Sage, John T.; Sager, J. H.; Schmidt, Rudolph; Schoenheit, J. H.; Schöffel, Geo. B.; Searle, H. S.; Selden, Geo. B.; Selden, Geo. B., Jr.; Selden, Henry B.; Shafer, M. F.; Shafer, W. F.; Sibley, H. W.; Sloan, W. E.; Smith, F. L.; Smith, F. R.; Smith, J. H.; Smith, W. L.; Snapp, Roy F.; Snook, S. R.; Southwick, T. T.; Snow, S. R.; Stapleton, J. A.; Steefel, Simon; Stearns, C. H.; Stern, A. L.; Storaandt, Carl W.; Streng, H. G.; Strong, H. A.; Strong, H. G.; Sumner, Chas. R.; Summers, J. S.; Sutton, G. W.; Swart, Phillip F.

Tarrant, F. J.; Taylor, J. W.; Teats Bros.; Terry, W. L.; Thayer, Samuel L.; Thing, G. E.; Thomas, G. W.; Thomas, C. M.; Thomson, Robert; Thompson, A. L.; Thompson, Mrs. F. F.; Thompson, F. K.; Thompson, G. T.; Thorn, C. A.; Toan, C. A.; Todd, C. W.; Todd, L. M.; Trotter, Frank C.

Underhill, E. F.

Van Voorhis, Norman; Vogt, Geo. J.; Voorhees, G. A.; Voshall, G. W.

Wackerman, G. W.; Waldron, Geo.; Wamsley, J. M.; Wand, R. H.; Warner, J. Foster; Warren, A. F.; Watson, J. S.; Watters, W. F.; Weinmann, C. C.; Weller, D. L.; Wheeler, Clarence; Whipple, Geo. C.; Whitney, Warham; Wilcox, G. D.; Wilcoxon, E. J.; Wilder, F. S.; Wile, Simeon; Williamson, H. A.; Williamson, W. H.; Willis, Henry; Wineburgh, Max; Wolfe, A. A.; Woodworth,

Rochester Automobile Club (Continued)

H. S.; Wrates, Thos.; Wray, C. F.; Wray, W. H.

Yawman, Phillip; Yeomans, E. L.

Zimbrich, A. M.; Zoller, F. W.

SPRINGFIELD (O.) AUTOMOBILE CLUB.

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Conklin, O. F.; Crabbs, B. E.

Downey, H. C.; Dimond, Dr. H. C.

Elliott, J. S.; Elliott, J. O.

Foos, W. F.; Fried, C. K.; Fish, F. B.

Gotwald, Dr. D. K.; Gwyn, E. C.; Grant, A. W.

Hoppes, J. J.; Hoffman, C. P.

Johnson, B. P.

Kitchen, J. F.; Kelly, G. E.; Kleeman, Jacob.

Mentel, G. E.; Myers, Dr. J. E.; Myers, W. A.

Neville, W. J.

Packham, F. R.

Russell, Dr. C. W.; Russell, Dr. L. E.; Ross, E. P.; Rice, H. E.; Rober, H. J.; Ridenour, C. E.

Sparks, A. F.; Staley, P. A.; Shawver, C. I.; Summers, Judge A. N.

Vinney, L.; Valentine, E. D.

Williams, J. K.; Worthington, R. A.; Welsh, W. V.; Weinland, H. G.

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Carr, L. F.; Carr, F. S.; Case, A. B.; Cameron, C. E. A.; Carmichael, Dr. J. H.; Calkins, Dr. C. H.; Carter, N. P. A.; Carpenter, J. H.; Calkins, Dr. I. R.; Chandler, L. J.; Chapman, Dr. C. R.; Clark, E. R.; Cook, W. F.; Cook, G. W.; Cole, J. C.; Collins, Dr. E. C.; Comins, Dr. Jas. B.; Converse, W. J.; Corbin, Arthur E.; Cutler, E. H.

Daniel, Harry; Davis, E. T.; Dexter, W. H.; Dexter, E. J.; Dickinson, H. F.; Dillon, L. W.; Downey, Dr. C. J.; Duryea, J. F.; Duckworth, Jas.

Eldredge, Earl C.; Erickson, Louis G.

Falt, J. P.; Farr, H. G.; Fay, Lawrence C.; Fenn, Dr. Geo. L.; Fisk, H. G.; Finch, Dr. George H.; Ford, W. A.; Folsom, J. L.; Fuller, Merrick L.

Springfield (Mass.) Auto Club (Cont.)

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Haynes, S. L.; Hannum, Dr. J. W.; Harris, Frederick; Helfer, W. J.; Henley, A. B.; Herrick, Dr. J. T.; Hersey, G. L.; Hill, Thos.; Hildebrand, C. C.; Hopkins, Dr. F. E.; Hooker, Dr. C. P.; Holbrook, George M.; Howard, F. D.; Hubbard, G. H.; Hubbard, F. A.

Irwin, Dr. V. J.

Jager, Fred G.

Kimberly, F. H.; King, Frank W. S.; King, H. F.; Knox, H. A.

Langtry, A. P.; Leary, Dr. W. C.; Ley, F. T.; Lerche, A. E.; Lewis, A. B.; Littlefield, W. J.; Lincoln, Flynt; Lynch, Dr. C. F.

Martin, Dr. H. C.; Marsh, H. E.; MacKenzie, F. R.; Marsh, Philip A.; Maynard, E. W.; McKee, Robt. A.; Mellen, D. W.; Mertens, E. G.; Millea, Frank J.; Morse, W. G.; Moses, H. A.; Murphy, E. J.; Murphy, F. C.; Murless, Dr. C. S.

Nelson, E. A.; Norcross, J. W.; Norcross, J. F.

Oatley, E. W.; Otis, K. R.; Otto, John C.

Page, Irving H.; Page, H. C.; Page, E. C.; Paris, B. J.; Pease, W. S.; Pierce, L. M.; Pillsbury, A. F. H.; Plummer, John D.; Pomeroy, Dr. W. H.; Powers, L. J., Jr.; Powets, L. J.; Punderson, H. F.; Punderson, S. F.

Remington, Wm.; Reopell, Albert V.; Riga, J. G.; Richmond, E. A.; Ripley, J. P.; Robeson, C. S.; Rogers, A. H.; Rood, F. K.; Rosenfield, S. J.; Ross, R. S.

Sackett, A. H.; Safford, R. K.; Sanburn, W. H.; Sargent, W. H.; Schmuck, H. E.; Scott, M. F.; Seelye, Dr. R. H.; Shean, C. T.; Shea, T.; Slocum, C. M.; Smith, R. Hale; Smith, Rodney L.; Small, F. F.; Squier, Dr. A. O.; Starr, B. C.; Stearns, H. S.; Stearns, E. F.; Stevenson, W. M.; Stoddard, Dr. M. J.; Stoddard, E. A.; Strout, F. P.; Sullivan, J. E.; Sutton, Edward O.; Swan, F. N.; Sweet, Dr. F. B.

Tait, W. G.; Tait, George G.; Taylor, F. B.; Towne, E. E.; Trench, Harry G.

Vickerman, R. E.

Wallace, A. B.; Ward, F. E.; Weiser, Dr. W. R.; White, M. T.; Whiting, S. R.; Wight, R. W.; Williams, P. A., Jr.; Witherell, A. L.; Woodbury, M. K.

Springfield (Mass.) Auto Club (Cont.)
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 Wright, W. E.; Wright, Harry R.;
 Wright, C. A. L.
 Young, C. L.

WHITEWATER (WIS.) AUTOMOBILE CLUB.

Bayer, Henry; Bulkley, R. B.; Blackman, T. M.
 Coburn, A. D.; Cox, J. C.
 Duffin, L. A.
 Halverson, H. L.
 Johnson, Lawrence.
 McDougall, Shirley.
 Sperbeck, Geo. W.
 Ward, John; Williams, O. B.

WILKES-BARRE (PA.) AUTOMOBILE CLUB.

Austin, Wadsworth; Alexander, W. Murray; Anderson, Ross; Ahlborn, F. W.
 Brader, Geo. G.; Baldwin, C. W.; Bertels, Charles E.; Bennett, Richard D.; Billings, Wm. P.; Bloom, A. H.
 Cashman, J. B.; Cobleigh, Dr. B. J. Carr, E. B.; Callahan, C. S.; Clark, Frank; Capwell, Clarence; Cool, Jas.; Coddington, Geo. F.; Conner, B. F.; Croll, Jas. S.; Coon, Bolton G.
 Davis, Chas. L.; Davis, E. W.; Davis, J. Wallace; Dodge, Wm. F.; Doughty, I. H.
 Edwards, Dr. L.; Edgar, L. E.
 Frantz, Harold G.
 Gallan, David; Galland, A. S.; Geddes, Howard P.; Goldsmith, James A.; Greuter, Chas. E.; Geary, H. J.
 Harding, Wm. G.; Harvey, Laning; Harvey, R. R.; Healey, M. J.; Helme, Frank;

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 Innis, E. A.

Jennings, Wm. N.; Johnson, Robt.; Jordan, H. E.; Johnson, Dr. F. C.

Kirby, F. M.; Kiefer, A. P.; Kelley, Dr. Will S.

Lamb, Jno. R.; Lee, Geo. F.; Lee, Wm. S.; Lee, Chas. W.; Lewis, George C.; Lewis, Geo. W.; Long, Z. H.

McKee, Dr. Frank L.; Moore, Guy W.; Meixell, P. A.; Miller, C. W.; Matheson, Chas. W.; Matheson, Frank F.; Marvin, Ira G.; Miller, Jno. E.

Nicholson, Samuel T.; Newberry, Wm. F.; Newell, T. L.; Norris, R. V.

O'Neil, Jno. F.

Pettibone, E. R.

Quin, Robt. A.

Roth, M. L.; Rust, Harold N.; Raub, Philip; Roberts, D. C.; Ridsdale, P. S.; Raeder, Wm. L.

Smith, A. D. W.; Scouten, Frank J.; Steelman, W. E.; Son, Wm. H.; Sturdevant, Robt.; Stegmaier, C. E.; Shepherd, Geo. E.; Shepherd, Edgar T.; Schooley, Eugene; Stark, Joseph; Shepherd, Wm. C.; Shepherd, Harry C.; Smith, Ernest G.; Schuler, Jos. G.

Van Horn, E. S.; Van Scoy, Isaac S.; Vaughn, R. B.

Wagner, Dr. E. C.; Wiegand, J. C.; Weckesser, F. J.; Weiss, Chas. H.; Williams, J. P.; Wright, T. A.; Welsh, George S.; West, Ambrose; Weitzenkorn, Jos. K.; Wheeler, A. E.; Wood, Chas. B. D.; Weller, Dr. Morgan; Walkinshaw, S. M.; Ward, C. A.

AUTOMOBILE LAW SECTION

PART ONE

Explanatory

Registration.

The automobile laws of the United States and other countries, as a general rule, provide for registration by three distinct classes of persons, i. e., owners of automobiles, manufacturers or dealers, and chauffeurs. These three main classes are covered in most of the enactments, but some of the laws contain modifications, such, for example, as requiring all operators, irrespective of whether they are owners or chauffeurs, to obtain driving licenses. Then, again, in some of the States of the United States, such, for example, as in Pennsylvania, only drivers are required to register and procure a license. No provision in this State is made specifically requiring owners or chauffeurs to become registered with the Secretary of State.

Registration Officers.

Registration is generally required to be made with a specified official, and the Secretary of State, in most of the States of the Union, is the designated officer with whom all or either one of the classes above mentioned must register their vehicles. In a few jurisdictions other officers are designated by law, such, for example, as in New Jersey, where the Assistant Secretary of State is, *ex officio*, Commissioner of Motor Vehicles. In Alabama the probate judge of the county is the official for the purposes of registration, and in one or two other jurisdictions registration officers other than the Secretary of State are appointed by law. A glance at the digest of the automobile laws will show who the proper registration officers are in the different jurisdictions.

How to Register.

In order to register either as an owner, manufacturer or dealer, or chauffeur, all that is necessary is for the applicant to write to the official having jurisdiction of the matter, who, as has been pointed out, is generally Secretary of State, and request that printed registration blanks be sent to him for the purpose of filling them out. These blanks should be filled out accurately, in accordance with the facts required to be stated, and if it is necessary to make affidavit to the statements contained in the blanks, the applicant should go before a notary public or other officer authorized to administer oaths and

swear to the facts he has written. It should be here noted that the making of a false statement in an application for registration and a license constitutes perjury and will subject the guilty applicant to criminal prosecution, so care should be taken to state the exact truth. It is a general requirement of the various officials with whom registration is made that the application blanks should be type-written. This is to avoid mistakes. The fees should be sent in with the application, but in some jurisdictions, personal checks are not accepted. Money orders are generally receivable, and in some places certified checks are acceptable.

Speed Limitations.

The various speed limits prescribed by many laws regulating the operation of automobiles on the public highways are necessary matters of information for the automobilist to ascertain whenever he drives or tours in any particular State or jurisdiction. Little can be said here in regard to speed limits other than that the motorist should be familiar with the maximum rates in places where he drives. In several of the States, municipalities and local authorities have passed speed ordinances which materially reduce the speed rates lower than the limits prescribed by the general State laws. The automobile driver should ever be on the lookout for municipal regulations of this kind; but in some of the States, municipalities are prohibited from regulating the speed of automobiles. Reference to the compilation of laws herein will enable the reader to ascertain what the speed limits are in the various jurisdictions of the United States, and British North America.

Equipment.

The matter of the equipment of one's automobile is of some little importance, since the laws in the various jurisdictions require that motor vehicles must carry lights, be equipped with suitable brakes and possess a suitable warning signal device. The kind, size and position of number tags are also matters of legislative requirement and it is necessary, in order for the motorist to be a legal traveler upon the public highways, to have his machine equipped according to law. Very little objection by the authorities, however, has been made in the past in regard

to the equipment of automobiles and it is unlikely that arrests will become common for minor delinquency concerning equipment.

Non-Residents.

Non-residents are permitted to enter some of the States, as will be seen by the chart of automobile laws, without taking out local registration and procuring a local license. It should be a matter of ascertainment by the automobilist who expects to tour through several States, whether he is permitted to drive in any particular jurisdiction without complying with the local registration requirements.

In most of the States a non-resident is permitted to enter under his own home State credentials, but several of the jurisdictions prohibit this, such, for example, as New Jersey and Pennsylvania. Many of the States allow the non-resident to enter and remain for a limited period of time, while some of the States say nothing about non-residents at all.

Speed at Curves, Corners, Descents, Bridges, etc.

In regard to the speed of automobiles at curves, corners, approaching and traversing bridges, and descending hills, it should be said that the laws require the speed to be reduced materially at such places, and in some of the States it is required that a less rate of speed must be maintained while passing travelers on the highway than otherwise if such travelers were not there.

The more specific and precise rules of law governing the operation of automobiles on the public highways and the various legal questions decided by the courts will be found in the pages following.

Meeting Horse-Drawn Vehicles.

It is the duty of the motorist to use reasonable care upon meeting travelers who are driving horse-drawn vehicles. Reasonable care in regard to this matter means that care which a reasonable man might be expected to exercise under the circumstances. It is the duty of the automobilist to stop his automobile if he sees that he is frightening a horse, and to stop his engine if it is frightening the animal. This matter is provided for by statute in most of the States, but even where no statutory provision exists, the common law demands that the automobile driver must exercise care to protect those with horses.*

Miscellaneous Provisions.

Miscellaneous provisions of the various automobile laws must be complied with, but we have heretofore mentioned the main subjects that the automobilist must consider in operating his car. The rules of

the road are familiar to all, and it is unnecessary to say that lamps should be lighted before dark and kept lighted until daylight. The various statutory enactments prescribe the exact hours for lighting lamps, but it is hardly a matter of seriousness if lamps are not burning until it is actually dark, or so dark that it would be carelessness to drive without lights.

THE AUTOMOBILE AND THE LAW.

Definitions.

At the outset, the subject of definitions is one which is dealt with to considerable extent in our automobile laws. For example, in most of the jurisdictions where automobile legislation has been enacted, the term "motor vehicle" is specifically defined by statute as to include all vehicles operated by power other than muscular, excepting motor vehicles run only upon rails or tracks.¹ This is the common definition which is to be found in the many motor vehicle laws of the States, with some few modifications, such, for instance, as excluding steam road rollers, fire engines, etc. No question is apt to arise in regard to what the term "automobile" or "motor vehicle" includes, because it is very well understood that the vehicle commonly called an automobile is that which is meant.

Words "Vehicle" and "Carriage."

The words "vehicle" and "carriage" are comprehensive enough to include the

*Note: Reasonable care must be taken by the driver of an automobile not to frighten a horse into committing injury and it is the duty of the automobilist upon meeting a frightened horse to slow down or stop.

Murphy vs. Wait, 103 N. Y., App. Div. 121, 92 N. Y., Supp. 253; Shinkle vs. Cullough, 116 Ky., 980; Indian Springs Co. vs. Brown, 74 N. E., Rep. 615.

Independently of a statute requiring an automobile driver to slow down or stop upon signal from a horseman, on the giving of a signal, the automobilist should stop when he sees that he is frightening a horse by proceeding.

Christy vs. Elliott, 216 Ill. 31.

However, where the horse plunges just as a slowly moving automobile is opposite it and no warning is given to the automobilist, the automobile driver is not liable for not stopping.

Davis vs. Maxwell, 108 App. Div. 128.

Only due and reasonable care is required of the automobilist and whether such care is exercised is to be determined by all the facts and circumstances of the case.

Indiana Springs Co. vs. Brown, 74 N. E., Rep. 615.

"Just when a horse is about to become frightened and just when he is actually frightened is very difficult to determine, and we think that the plain meaning of the statute is to require persons using such vehicles as automobiles, calculated to frighten horses, to stop the same whenever a horse shows indication of fright upon their approach." is the language of the Illinois Supreme Court in

Ward vs. Meredith, 77 N. E., Rep. 118, 220 Ill. 66.

¹See the automobile statutes of the various States.

automobile³ and in common parlance, unless something to the contrary appears to make the meaning different, in almost every law where these terms are used the automobile would very properly be included, no matter if the law was passed before the advent of the horseless carriage. There are, however, some instances where it would be necessary to specifically mention the automobile in order to have it included within the terms of legislation and legal instruments, or else use the word "vehicle" or some other term comprehensive enough to cover the automobile. A recent case decided in the State of New York by the Supreme Court⁴ affords an example of the necessity for specifically including the power vehicle in the terms of a toll bridge charter. It was held in this case that inasmuch as the charter did not specifically allow the bridge company to charge tolls for automobiles, and since there was no other general word to cover motor vehicles, the toll bridge company had no right to charge tolls for automobiles which passed over its bridge.

Other Terms Including the Automobile.

The automobile may also be included within the terms of certain words which would at first blush, and in common understanding, not include what we commonly understand the automobile to be. In the State of Maine by express terms of the statute, it is declared that the word "team" shall include all vehicles and carriages.⁵ Inasmuch as the automobile is a vehicle it naturally is by a strained construction of the term "team," included within its meaning. Some of the State statutes, in defining the term automobile, use the terms "autocar" and "locomobile" as meaning the automobile, but the use of these terms is obviously improper. There may be instances arising where the term "carriage" would not include the automobile if it can be ascertained from the wording of the entire statute or instrument that an intention existed not to include the motor vehicle, such, for example, where a man makes his will and leaves all his vehicles

to his son, naming each vehicle, and it appears that he possessed only horse-drawn carriages. It is very probable that a subsequently acquired automobile would not pass under the will as a subject of the specific bequest. Some such ruling as this has been made in England. Other definitions will be considered in the following pages under different topics.

RIGHT TO USE THE HIGHWAYS.

The public highways were not meant to be confined in their use to any particular means of transportation.⁶ The law keeps pace with the progress of scientific inventions and the necessities of the times.⁷ The primary purpose of our public ways is to accommodate travel, whether that travel be by foot or by animal-drawn vehicles or power conveyances. These rules in regard to the purposes of our public thoroughfares have been firmly established in our English jurisprudence and it is not long since it was forever set at rest that our public avenues of travel even contemplated transportation by means of the trolley car operated upon tracks. So there can be no question regarding the right to operate an automobile on the public highways; in fact, the motor vehicle possesses equal rights on our public thoroughfares and animal-drawn carriages have no rights superior to them.⁸

THE CHAUFFEUR.

Definitions.

The term "chauffeur" is defined in our automobile legislation as one who operates an automobile as a mechanic or employee, or for hire. In one of the Canadian provinces, he is defined as a person who habitually operates a motor vehicle for pay, or as one who is a paid automobile driver. In Missouri, the automobile enactment does not speak of hired drivers as chauffeurs but calls them "auto drivers." It makes very little difference as to the name given to those who operate motor vehicles for hire, if the law makes it clear as to the persons meant.

Relation Between Chauffeur and Employer.

The chauffeur is in law considered to be a servant. His employer is the master.

³The automobile is a vehicle in common use for transporting both persons and merchandise upon the public ways. *Baker vs. Fall River*, 72 N. E. Rep. 336. See also *Com. vs. Hawkins*, 14 Pa. Dist. Rep. 503. In *Thompson vs. Dodge*, 58 Minn. 555, the court says concerning the bicycle: "The term 'vehicle' includes a bicycle, the latter being used very extensively for convenience, recreation, pleasure and business; and the riding of bicycles upon the public highway in the ordinary manner, as it is now done, is neither unlawful nor prohibited, as they cannot be banished because they were not ancient vehicles and used in the Garden of Eden by Adam and Eve." The same may be said of the automobile.

⁴*Mallory vs. Saratoga Bridge Co.*, 104 N. Y. Supp. 1025.

⁵See the Law of the Road in the Maine statutes.

⁶*Macomber vs. Nicholas*, 84 Mich. 217; *Indiana Springs Co. vs. Brown*, 74 N. E. Rep. 615.

⁷*Indiana Springs Co. vs. Brown*, 74 N. E. Rep. 615.

⁸*Macomber vs. Nicholas*, 84 Mich. 217; *Moses vs. Pittsburgh R. R. Co.*, 21 Ill. 515; *Indiana Springs Co. vs. Brown*, 74 N. E. Rep. 615; *Christie vs. Elliott*, 216 Ill. 31; *Upton vs. Windham*, 75 Ct. 288; *Shinkle vs. Cullough*, 77 S. W. Rep. 196. But automobiles, according to a California decision, may be excluded from country roads at night. See *Ex parte Berry*, 82 Pac. Rep. 44. *Bertles vs. Turnpike Co.*, 15 Pa. Dist. Rep. 94.

There exists between the two what is termed in law, the relation of master and servant, employer and employee, principal and agent. This relation is of the utmost importance, since the principal, the employer, the master, is responsible for all the acts of the chauffeur which he commits while acting for his employer, or within his authority, expressed or implied. If the chauffeur, while driving for his master, runs into another on the highway and injures him, while carelessly driving at the time, the master is liable,⁸ but, in order to hold the employer legally liable for an injury committed either to person or property, it must be alleged and proved that the chauffeur acted for his employer, and not contrary to, or outside of his instructions.⁹ If a chauffeur drives contrary to authority at any particular time or to any particular place, without the assent of his employer, or if he drives for the purpose of his own pleasure, or the pleasure of his friends, then his employer is not liable for any injury which happens during such driving.¹⁰ This is well established, although in Missouri there is a decision which has recently been handed down, holding that one who drives as a chauffeur is presumed to have acted for his employer unless the contrary is shown.¹

Chauffeur's Duties.

The duty of the chauffeur is to act for his employer, not only in driving the automobile, keeping it in reasonable repair and complying with the law, but to act for his employer honorably in supplying the vehicle with necessary parts. This means that the chauffeur has no legal authority to obtain secret commissions in purchasing supplies.² Such commissions are clearly illegal. Between the chauffeur and his employer there exists the relation of trust and confidence. This relation is well recognized by the law and any benefit derived by the chauffeur in handling his master's business legally belongs to

the employer. Garage keepers and others who do business with chauffeurs are equally as bound by this rule of law as chauffeurs and may be compelled to restore to owners secret commissions which chauffeurs obtain.

Compensation.

The chauffeur is entitled to compensation from his employer and may not be unlawfully discharged before the expiration of his term of service, but if the chauffeur acts wrongfully, or fails to fulfill his duties, then the master has sufficient ground for terminating the employment. On the question of wages, if the chauffeur has wrongfully used the car, without authority, or damaged it, it is perfectly legitimate for the owner to detain an amount equal to such damage from wages due to the chauffeur, but no more than the damage actually suffered can be withheld.

THE GARAGE KEEPER.

An automobile garage has been defined by the Supreme Court of the State of New York as the modern substitute for the ancient livery stable,³ the court holding that the garage keeper possesses no lien upon an automobile for unpaid charges for repairs and storage where the machine is used and taken out from day to day by the owner, independently of any contract creating a lien. It should be suggested here that it would be highly advisable for garage keepers to enter into a specific written contract providing for a lien when they take machines upon storage, that is, if they desire to possess authority to detain an automobile until charges are paid. It has also been held in the State of New York that an automobile garage located upon the public highway is not a nuisance *per se*,⁴ but in Massachusetts it has been held by the Supreme Judicial Court that the erection of an automobile garage violates a covenant in a deed running with the land which prohibited the building of structures or carrying on of any business which would make the community unfit or unpleasant for dwelling purposes. There have been a few decisions concerning the storage of gasoline in garages, especially in New Jersey where it has been held that to store certain quantities of gasoline in the tanks of automobiles, which vehicles are kept in a wooden structure, constituted such a nuisance, threatening danger from conflagration, that an adjoining property owner had the right to resort to an injunction to restrain the conduct of the business in such a manner.

⁸See Huddy on The Law of Automobiles, p. 94. No liability for negligence of borrower of machine, on part of owner. *Doran vs. Thomsen*, 66 At. Rep. 897. A dealer or seller is liable where he furnishes a careless chauffeur. *Burnham vs. Central Automobile Exchange*, 67 At. Rep. 529.

⁹*Lotz vs. Hanlon*, 66 At. Rep. 525; *Patterson vs. Kates*, 150 Fed. Rep. 481; *Evans vs. A. L. Dyke Automobile Supply Co.*, 101 S. W. Rep. 1152; *Doran vs. Thomsen*, 66 St. Rep. 897; *Lotz vs. Hanlon*, 217 Penn. 329; *Braverman vs. Hart*, 105 N. Y. Supp. 107; *Reynolds vs. Buck*, 103, N. W. Rep. 946; *Clark vs. Buckmobile Co.*, 107, N. Y. App. Div. 120; *Stewart vs. Baruch*, 93 N. Y. Supp. 161; *Collard vs. Beach*, 81 N. Y. App. Div. 582. See Huddy on The Law of Automobiles, p. 95.

¹⁰*Lotz vs. Hanlon*, 66 At. Rep. 525. See also citations in note⁸.

¹*Long vs. Nute*, 100 S. W. Rep. 511.

²See *People vs. Bergoli*, New York Law Journal, Jan. 14, 1907. In some States the automobile laws expressly prohibit "graft" by chauffeurs, notably Illinois. A general statute takes care of the matter in New York.

³*Smith vs. O'Brien*, 46 N. Y. Misc. Rep. 325.

⁴*Stein vs. Lyon*, 91 N. Y. App. Div. 593.

The garage keeper is a bailee for hire. He takes into his custody the property belonging to others for storage, safe keeping and protection. He agrees to keep the property safely, and within the terms of the contract of bailment it is his duty to provide proper storage facilities for careful protection of machines, not allowing outsiders to enter the garage and do damage, or insiders to injure the automobiles in his custody. The garage keeper is responsible if articles of personal property left in machines are stolen from his garage, no matter by whom taken. He is obliged to take reasonable precautions against fire, and to protect machines from freezing. On the other hand, he is entitled to the compensation agreed upon for the storage or repairs of automobiles, and where there has been no express agreement, to a reasonable sum for his services.

RIGHTS AND LIABILITIES OF INNKEEPERS.

The touring automobilist frequently comes in contact with hotel proprietors and innkeepers. He is compelled to stop at inns and hotels all along his tour and it is necessary for him to know his rights as against the hotel proprietor or the keeper of an inn in order to understand what his obligations are. Most of the hotels and inns provide a place for storing automobiles belonging to guests, either a garage, or a barn, or some kind of a shed. It should be said, however, that if a place of storage is provided at a hotel or an inn, and a charge is made for the storage, a proper place must be afforded, and it is the duty of the hotel proprietor or innkeeper to place his guests' automobiles in a safe enclosure, which will protect machines from cold, fire, or theft.

In regard to the compensation for storing an automobile, a reasonable price is all that may be charged by a hotel proprietor or innkeeper, and what is reasonable is to be determined by what the customary charge is in the particular locality. Any damage suffered by the machine while in the care of the hotel proprietor must be paid for by him. He is, in fact, a garage keeper for all intents and purposes, to the extent of caring for the machines of those who stop at his hotel or inn.*

MUNICIPAL REGULATIONS.

Throughout the United States and some of the foreign jurisdictions, municipalities and local authorities have passed regulations concerning the operation of automobiles. The automobilist should ever be on the lookout for these local regulations, for he is apt to be controlled

by them when he does not know it. In many of the States of the United States, municipalities are prohibited from enacting local ordinances concerning the automobile or its operation. In some of the States there is no such prohibition and the question has arisen whether, in the absence of anything said in the State motor vehicle laws concerning the subject, a municipality possesses the power to pass local regulations. It has been held that under such circumstances the local authorities may enact ordinances governing the operation of motor vehicles. This has been the ruling in Pennsylvania.

The decisions concerning this subject will be found in the foot note.*

VIOLATIONS OF LAW.

By far the greater number of violations of law by automobilists are for over-speeding. More cases are brought into the courts on this charge than other infractions of the provisions of our automobile legislation. Our automobile laws establish such low rates of speed that it is practically impossible to obey the legal requirements.

In proving that an automobilist violated the speed law it is necessary for the prosecution to establish two facts, first, that the machine traveled faster than the legal limit; second, that the accused drove the machine at the time. These facts must be established not by merely a preponderance of evidence, but beyond a reasonable doubt. Stop-watch testimony is competent for the purpose of establishing a violation of the speed limit, but the evidence derived from the use of a speedometer is more trustworthy, since this instrument requires no judgment in the estimation of the time consumed and is purely mechanical, while the stop-watch requires judgment on the part of the officer. The automobilist is entitled to bail upon being arrested and to a full and fair hearing. These are constitutional rights afforded to every person accused of crime. Violations of the automobile laws are merely misdemeanors and in no jurisdiction is such a violation a felony. For first offense, a fine is generally the penalty, but subsequent offenses may make imprisonment possible. It is advisable for those who expect to contest cases of speed violation, to measure the course over which they were timed by the officer in order to ascertain the number of feet of the course, and defendants in speed cases

**People vs. Hainer*, New York Law Journal, Oct. 31, 1907, holding that the State speed limits still control in New York City. See also *Brazier vs. Philadelphia*, 15 Pa. Dist. Rep. 14; *city of Bellingham vs. Cassa*, 87 Pac. Rep. 481. In *Chicago vs. Banker*, 112 Ill. App. 94 it was held that the city of Chicago had no power to pass local regulations concerning licenses.

*See VI., The Garage Keeper.

should also make very thorough preparation of their cases before going to trial, since it is one of the most difficult of tasks to break down stop-watch evidence.

THE LAW OF THE ROAD.

The law of the road consists of those rules governing travel in the public highways. This law had its origin in custom and differs somewhat in different localities. For example, in England vehicles turn to the left in passing, while in America they pass to the right. The rule in regard to passing is not inflexible, however, for circumstances may compel travelers to disobey the generally established rule. Where to turn to the right would cause danger or injury, the traveler is justified in passing to the left in the United States and to the right in England. The one main and great rule for travelers on the public ways to follow is, avoid danger to yourselves and others.

Lighter vehicles are expected to favor heavier conveyances when the heavier carriage is less easily handled. It is the duty of each driver to give a passing vehicle half or an ample part of the road. The highway must not be unreasonably blocked.

OPERATION OF AUTOMOBILES.

"A public highway is open in all its length and breadth to the reasonable, common, and equal use of the people, on foot or in vehicles. The owner of an automobile has the same right as the owner of other vehicles to use the highway, and, like them, he must exercise reasonable care and caution for the safety of others. A traveler on foot has the same right to the use of the public highway as an automobile or any other vehicle. In using such highway all persons are bound to the exercise of reasonable care to prevent accidents. Such care must be in proportion to the

danger in each case. Where one undertakes to pass another on the highway, going in the same direction, he must take reasonable care to exercise that right so as not to injure another, and would be liable for all consequences resulting from negligence or imprudence on his part. It is the duty of a person operating an automobile or any other vehicle upon the public highway, to use reasonable care in its operation, to move it at a rate of speed reasonable under the circumstances, and cause it to slow up or stop, if need be, when danger is imminent, and could, by the exercise of reasonable care, be seen or known in time to avoid accident. There is a like duty of exercising reasonable care on the part of the person traveling on foot. The person having the management of the automobile and the traveler on foot are both required to use such reasonable care, circumspection, prudence, and discretion as the circumstances require; an increase of care being required where there is an increase of danger. And both are bound to the reasonable use of all their senses for the prevention of accident, and the exercise of all such reasonable caution as ordinarily careful and prudent persons would exercise under like circumstances. The more dangerous the character of the vehicle or machine, and the greater its liability to do injury to others, the greater the degree of care and caution required in its use and operation. And a person traveling on foot on a public road is required to use reasonable care to avoid collision with a vehicle, and if he saw the vehicle before it struck him, or by the reasonable use of his sense could have seen it in time to avoid the injury, it is his duty to do so.'

¹*Simeone vs. Lindsay*, 65 At. Rep. 778 per Judge Pennewill; *Mendelson vs. Van Rensselaer*, 103 N. Y. Supp. 378; *Lampe vs. Jacobsen*, 90 Pac. Rep. 654.

PART TWO

DIGEST OF AUTOMOBILE LAWS

UNITED STATES

	ALABAMA.	CALIFORNIA.
Registration.	Owner must register machine with Probate Judge of resident county or in county where machine is to be operated, giving name of owner or operator. No provisions concerning chauffeurs. Manufacturers and dealers are exempt, excepting machines in personal use.	Owners, manufacturers and chauffeurs must register with the Sec. of State.
Fees.	\$.25. The license is perpetual.	Owners \$2. Manufacturers \$2. and \$.50 for duplicate seals. Chauffeurs \$2. The licenses are perpetual.
Numbers.	None required.	Not less than 3 in. high with abbreviated name of State not less than 1 in. high, black or white ground, displayed on rear.
Lamps and Equipment.	No lamps required, but there must be appliances to lessen noxious odors, diminish noise and to bring the vehicle to a quick stop.	2 white forward, showing registered number of machine, 1 red reverse. Good brakes must be had, also suitable signal device.
Non Residents.	Not exempt.	Exempt temporarily, if carrying credentials under own State law.
Speeds.	8 m. Crossing dams and causeways where the traveled roadbed is less than 20 ft. wide the maximum is 4 m.	Must always be reasonable. 10 m. closely built up districts; 15 m. elsewhere in incorp. municipalities; 20 m. outside; 4 m. dams, bridges, sharp curves and steep descents.
Misc. Provisions.	Must stop upon signal from horseman and stop engine upon request.	Must stop upon signal from horseman and stop engine upon request.
Penalties.	\$20. to \$100. 1st offense; \$50. to \$200. subsequent convictions, or 30 d. to 6 m.	Not exceeding \$100. or 30 d. or both 1st offense; \$50. to \$100. or 30 d. or both, 2nd offense; subsequent offenses, \$100. to \$250. or 30 d. or both.

	CONNECTICUT.	DELAWARE.
Registration.	Owners, manufacturers, dealers and operators must register with the Sec. of State. Age limit of operators 18 years.	Owners, operators, manufacturers and dealers must register with the Sec. of State. Age limit of operators is 16 years.
Fees.	\$3. less than 20 hp.; \$5. 20 to 30 hp.; \$10. 30 hp. and over. Of two ratings highest will be taken. Dealer's certificate \$10.; \$100. for manufacturer's certificate and \$2 for operator's license. The licenses are annual.	Owners \$3.; operators \$2.; manufacturers \$3. Licenses are annual, expiring Dec. 31st.
Numbers.	Front and rear with initial letter of State not less than 4 in. high.	Not less than 5 in. high with abbreviated name of State and the year on front and rear.
Lamps and Equipment.	1 or more white forward and 1 red rear with side white illuminating number. Suitable brakes and signal device must be had.	At least 1 white forward and 1 red rear. The number tag must be illuminated at night. Suitable brakes and signal device must be had.
Non Residents.	Exempt 10 successive days at any one time, if carrying credentials under own State law.	Exempt 10 days annually, if carrying credentials under own State law.

	Connecticut (continued).	Delaware (continued).
Speeds.	Must be reasonable considering the circumstances. Exceeding 25 m. an hour for 1-8 of a mile is prima facie unlawful.	Where buildings average less than 100 ft. apart 12 m., but at curves and intersections 10 m.; where buildings average more than 100 ft. apart 20 m., but at curves, intersections, descents and passing other vehicles 12 m. Ambulances, physicians, policemen, fire and military vehicles are exempt.
Misc. Provisions.	Must stop machine and engine upon signal from horseman, or if causing danger.	Must stop machine and engine if causing danger to horseman.
Penalties.	Speeding: manner of operation, racing and intoxicated person driving, not more than \$200. or 30 d. or both 1st offense; subsequent offense not more than \$500. or 60 d. or both. Violation of other provisions not more than \$100. or 30 d. or both.	Not less than \$10. nor more than \$20.; subsequent offense within 6 months, not less than \$25. nor more than \$100.; 3rd offense within 1 year not less than \$100. nor more than \$200.; intoxicated person driving, not more than \$100. or 30 d. or both.

	DISTRICT OF COLUMBIA.	FLORIDA.
Registration.	Operators must qualify before Board of Examiners.	All owners or operators and chauffeurs must register with the Sec. of State.
Fees.	No fee is required. The license is perpetual.	Owners \$2. Chauffeurs \$2. The licenses are perpetual.
Numbers.	Not less than 3 in. high with initials "D. C." not less than 1 in. high on rear.	Not less than 3 in. long and 2 in. wide on rear.
Lamps and Equipment.	2 white forward; 1 red rear illuminating number. A lock suitable to lock the starting lever, throttle or switch must be provided, and used when vehicle is left standing. Suitable signal must be had.	2 lights required, but color and location not designated. Suitable signal must be provided.
Non Residents.	Non residents are required to register with the Secretary of the Automobile Board which exempt them 60 d.	Exempt 30 d. if having license from another State.
Speeds.	4 m. corners in Wash.; 6 m. cross-streets at car tracks; 12 m. where no tracks; 15 m. in country. Fire limits 12 m. between cross-streets; 15 m. parks; 6 m. corners; 4 m. certain designated highways; 20 m. outside fire limits; 12 m. meeting and passing vehicles.	Must always be reasonable. 4 m. at sharp curves, bridges, fills and intersections.
Misc. Provisions.	Automobiles going north or south have the right of way or those travelling east or west.	Must stop upon signal from horseman.
Penalties.	Speeding not less than \$5. nor more than \$50. 1st offense; 2nd offense within 1 year, \$10. to \$100. or 5 to 30 d.; 3rd offense within 1 year, \$50. to \$250. and 30 d. to 6 m. Driving without license and other violations not over \$40.	Speeding, 1st offense maximum \$100.; 2nd offense minimum \$50. maximum \$100. or 30 d. or both; 3rd offense minimum \$100., maximum \$250. or 60 d. Registration, lamps, horn, etc., maximum \$100. Other violations 1st offense maximum \$25.; 2d offense minimum \$25., maximum \$50.; subsequent offenses minimum \$50., maximum \$100. or 10 d., or both.

	GEORGIA.	ILLINOIS.
Registration.	Registration with Clerk of Superior Court. In this State the law applies to Catoosa County only.	Owners, manufacturers, dealers and chauffeurs must register with the Sec. of State.
Fees.	No mention.	Owners \$2. Manufacturers \$2. Chauffeurs \$1. The licenses are perpetual.
Numbers.	Not less than 1 1-2 x 2 1-2 in. on rear.	Not less than 4 in. high with letters ILL. not less than 1 in. high black on white ground on front and rear of vehicle.
Lamps and Equipment.	No mention.	2 white forward containing numbers and 1 red rear. Good brakes and suitable signal must be had.
Non Residents.	Not exempt.	Exempt if carrying credentials under own State law.
Speeds.	10 m. generally and 2 m. passing animal drawn vehicles.	Must always be reasonable. 12 m. corners and cross-roads; 15 m. residential portions of incorp. village, town or city; 10 m. closely built up sections; elsewhere 20 m.
Misc. Provisions.		Good brakes and suitable signal must be had. Engine cannot be left running without an attendant. Must stop if frightening horse. Automobile cannot be used without consent of owner.
Penalties.	The penalties range from \$10. to \$200. Subsequent offenses may double penalties and authorize imprisonment and suspension of license.	Registration, numbers, lamps, brakes, horns, etc., \$25.; speeding, racing, not stopping for frightened animal \$200.; chauffeur's registration \$10.; badge \$15.; not giving name in case of accident \$100.; driving without owner's consent and payment of bonuses \$200.; other violations \$100. Heavier penalties are provided for successive convictions.

	INDIANA.	IOWA.
Registration.	Owners and manufacturers or dealers must register with the Sec. of State. No provisions concerning chauffeurs.	Owners and dealers must register with the Sec. of State.
Fees.	Owners \$1. Manufacturers or dealers \$1., \$.50 for duplicate seals. The licenses are perpetual.	Owners \$5. Dealers \$10. annually. Owner's license is perpetual.
Numbers.	4 in. high with 1st first three letters of State name white upon black ground on front and rear.	Not less than 3 in. high with initial and terminal letters of State's names not less than 2 in. high on rear.
Lamps and Equipment.	"After dark all automobiles shall carry lighted lamps." Good brake and suitable signal must be had.	1 or more white lights forward and 1 red reverse. Good brakes and suitable signal must be had.
Non Residents.	Exempt, if carrying credentials under own State law.	Exempt, if carrying credentials under own State Law.
Speeds.	Must always be reasonable. 8 m. business and closely built up sections municipalities; 15 m. elsewhere in municipalities; 20 m. outside municipalities; upon approaching and passing animals 6 m.	Must always be reasonable. Closely built up sections of cities, towns and villages 10 m.; elsewhere in cities, towns and villages 15 m.; outside of same 20 m.
Misc. Provisions.	Must sound warning upon approaching animals and stop upon signal or request.	Must stop upon signal from horseman.
Penalties.	\$50. maximum 1st offense; \$100. maximum 2nd offense; \$200, maximum subsequent offenses.	\$25. maximum 1st offense; \$25. minimum, \$50. maximum, or 30 d. subsequent offenses.

	KANSAS.	KENTUCKY.
Registration.	No State law for registration. Municipal or local authorities should be consulted.	No State law for registration. Municipal or local authorities should be consulted.
Fees.	No State law concerning fees. Municipal or local authorities should be consulted.	No State law concerning fees. Municipal or local authorities should be consulted.
Numbers.	No State law concerning numbers. Municipal or local authorities should be consulted.	No State law concerning numbers. Municipal or local authorities should be consulted.
Lamps and Equipment.	1 or more white lights forward. Good brakes and suitable signal device must be had.	1 white forward and 1 red reverse and must be displayed in heavy fog. Good brakes and suitable signal must be had.
Non Residents.	Exempt so far as State is concerned.	Exempt so far as State is concerned.
Speeds.	Must always be reasonable. 20 m. outside thickly settled or business sections of cities or towns; within such places 10 m.	Must always be reasonable. 6 m. crossings, bridges, curves and descents; 15 m. elsewhere.
Misc. Provisions.	Must stop upon signal from horseman.	Must stop upon signal from horseman.
Penalties.	\$100. maximum.	\$10. minimum, \$100. maximum.

	MAINE.	MARYLAND.
Registration.	Owners or persons in control, manufacturers or dealers and operators must register with the Sec. of State.	Owners and chauffeurs must register with the Sec. of State.
Fees.	Owners \$2. Manufacturers or dealers \$10. Special operator's license \$2. Licenses are perpetual.	Owners \$3. Chauffeurs \$2. Licenses are perpetual.
Numbers.	Not less than 4 in. high with "Maine" not less than 1 in high, front and rear.	Not less than 3 in. high white on black ground on front and rear no other numbers permissible except residents of D. C., who carry own number followed by "D. C." not less than 1-2 in. high.
Lamps and Equipment.	1 light, color and position not prescribed. Suitable signal.	At least 2 white forward showing number and 1 red reverse. Good brakes and suitable signal device must be had.
Non Residents.	Exempt, if carrying credentials under own State law if not prohibited by special law or town ordinance duly authorized.	Not exempt.
Speeds.	Must always be reasonable. 8 m. within built up sections of cities, towns, and villages except when locally permissible; 15 m. elsewhere; no faster than a walk over bridges.	Must always be reasonable. 6 m. sharp curves; intersection prominent highways open country and in built up section of municipalities, except in cities of 16,000 or more inhab.; elsewhere 12 m. approaching animals 6 upon signal.
Misc. Provisions.	Must stop upon signal from horseman.	Must stop upon signal from horseman. Warning must be given upon approaching animals, intersections and curves. Machines left unattended must be locked.
Penalties.	\$50. or 1 y. maximum penalty.	Registration maximum \$50.; numbers maximum \$20.; fictitious number maximum \$50.; lamps maximum \$20.; speeding, curves and crossings maximum \$25; built up sections of cities maximum \$25.; elsewhere maximum \$50.; meeting horses maximum \$50.; double fines 2nd offense; reckless driving or habitual speeding 60 d. maximum in addition to fine.

	MASSACHUSETTS.	MICHIGAN.
Registration.	Owners or persons in control, operators, manufacturers and chauffeurs must register with the Mass. Highway Com.	Owners, manufacturers, dealers, liverymen and chauffeurs must register with Sec. of State.
Fees.	Owners or persons in control \$5. Manufacturers \$15. Operators and chauffeurs \$2. Registration of automobiles expire yearly on Jan. 1st. Private operator's license is perpetual; a chauffeur's annual renewal \$.50.	Owners \$1. for registration and \$.50 renewal. Manufacturers, dealers and liverymen \$.5.; duplicate seals \$.50; renewals \$.25. Chauffeurs \$1.; renewals \$.50. Registration remains in force for 1 year only for all parties.
Numbers.	4 in. high, white on dark blue, front and rear. Only Mass. numbers allowed except exempted non residents.	Not less than 3 in. high front and rear with name of State in full or abbreviated, black on white ground or the reverse, letters to be not less than 1 in. high. More than one registration number cannot be carried on vehicle.
Lamps and Equipment.	2 lamps showing white lights forward containing numbers. Adequate brake, suitable signal device and a muffler must be provided, also a lock must be had.	2 white forward and 1 red rear.
Non Residents.	Exempt not exceeding 7 days, if carrying own State credentials.	Exempt, if carrying own State credentials and own State reciprocates.
Speeds.	Must always be reasonable. 12 m. cities; 20 m. country; 8 m. curves and intersections.	Must always be reasonable. 25 m.; within cities and villages business sections 8 m.; elsewhere in cities and villages 15 m.; approaching others on highway 10 m.
Misc. Provisions.	Must stop upon frightening horse or upon signal from driver. Machine must be locked if left unattended.	Must stop upon signal from horseman and stop motor upon request.
Penalties.	After revoking license \$100. or 10 d., or both; fictitious number or defacing same, \$100. or 10 d., or both; reckless operation or intoxication, \$100. or 6 m., with revocation of license and registration for at least 60 d.; refusing information, \$25. to \$100.; \$25. maximum 1st offense, \$50. maximum 2nd offense; \$100. maximum subsequent offenses in 1 year for speeding.	\$25. maximum; 2nd offense \$50. maximum; 3rd offense \$100. maximum or 30 d. or both.

	MINNESOTA.	MISSOURI.
Registration.	Owners must register with State Boiler Inspector. No provisions concerning chauffeurs or manufacturers and dealers.	Owners, manufacturers, dealers and chauffeurs must register with the Sec. of State. Automobile drivers must be 18 years old.
Fees.	\$2. The license is perpetual.	Owners \$5. Manufacturers \$5. Chauffeurs \$2.
Numbers.	Not less than 4 1-2 in. on rear.	Not less than 3 in. high on rear with "Mo." white or black ground, letters not less than 1 1-2 in. high; also number must be displayed by illuminated device in front in dark.
Lamps and Equipment.	At least 1 light. Muffler must be used and must not be cut out within cities and villages. A bell or horn must be had.	At least 2 white lights forward and 1 red reverse. Good brakes and suitable signal device must be had.
Non Residents.	Not exempt.	Exempt 19 days, if carrying own State credentials.
Speeds.	8 m. thickly settled business sections of cities and villages; outside such places 25 m.; at crossings within cities and villages 4 m.	Must always be reasonable. 15 m.; corners and curves 6 m.; cities, towns and villages 8 m. in business sections and 10 m. in other parts.
Misc. Provisions.	Must stop upon signal from horseman.	Must stop upon meeting animals and must stop upon signal from horseman.
Penalties.	Violation of law constitutes a misdemeanor which is punishable under the general statutes.	\$25. minimum. \$100 maximum 1st offense; \$50. minimum, \$500 maximum or 60 d. 2nd offense and forfeiture of privileges.

	MONTANA.	NEBRASKA.
Registration.	No State law concerning registration. Local or municipal authorities should be consulted.	Owners must register with the Sec. of State. No provisions concerning manufacturers or dealers and chauffeurs.
Fees.	No State provision concerning fees. Local or municipal authorities should be consulted.	\$1. License is perpetual.
Numbers.	No State provision concerning numbers. Local or municipal authorities should be consulted.	Not less than 3 in. high on rear with initial and terminal letters of State's name 2 in. high.
Lamps and Equipment.	No State law concerning lights or equipment.	1 or more white lights forward and 1 red reverse. Good brake; and suitable signal device must be provided.
Non Residents.	Exempt so far as State is concerned.	Exempt, if carrying own State credentials.
Speeds.	8 m. within cities, fire districts, thickly settled parts of towns; 20 m. elsewhere.	Must always be reasonable. 10 m. built up sections cities, towns and villages; other sections thereof 15 m.; elsewhere 20 m.
Misc. Provisions.	Must stop upon signal from horseman.	Must stop upon signal from horseman.
Penalties.	Maximum \$100. or 60 d. or both.	\$25. maximum 1st offense; \$35. to \$50. or 30 d. maximum subsequent offenses.

	NEW HAMPSHIRE.	NEW JERSEY.
Registration.	Owners or persons in control, manufacturers or dealers, operators and chauffeurs must register with the Sec. of State.	Assistant Sec. of State is ex-officio Commissioner of Motor Vehicles. Owners, manufacturers or dealers, operators and chauffeurs must register. Age limit of operators 16 years.
Fees.	Owners or persons in control \$3. Manufacturers or dealers \$10. Operator's license \$1. Chauffeur's \$5. The operators and chauffeur's licenses are annual. Other licenses are perpetual.	Registration of motor vehicle \$3. under 30 hp.; \$5. 30 hp. or over. Manufacturers or dealers \$20. License to drive \$1. under 30 hp.; \$2. 30 hp. or over. Licenses are perpetual.
Numbers.	Not less than 4 in. high with "N. H." front and rear.	Must be 4 in. high. No other numbers allowed.
Lamps and Equipment.	Must have "lighted lamps" with numbers not less than 1 in. high. Adequate brake, efficient muffler and suitable signal device must be had.	At least 2 white forward showing numbers and 1 red reverse. Lights must be displayed in thick fog. Machines above 10 hp. must have 2 brakes.
Non Residents.	Exempt, if licensed in another State.	Not exempt.
Speeds.	8 m. in business districts and compactly built up sections of cities and towns; 20 m. elsewhere.	Must always be reasonable. 1 m. in 7 min. curves; 15 m. inter-sections or within 200 ft. of animals; 12 m. in built up sections of cities, towns and villages elsewhere 20 m.
Misc. Provisions.	Must stop upon signal from horseman and stop engine upon request.	Must stop upon signal from horseman. Chains cannot be used. Excessive noise and smoke prohibited.
Penalties.	\$10. maximum 1st offense; \$50. maximum and revocation of license subsequent offenses; driving after withdrawal of license maximum \$100 or 30 d. or both.	Displaying numbers or driving unregistered car maximum \$100. 1st offense; \$200. maximum 2nd offense; fictitious numbers, no license, driving without owner's consent or when intoxicated, maximum \$500. or 60 d.; refusing name and address in case of accident maximum \$250. or 30 d.; failure to register maximum \$100.; racing or speeding maximum \$100. with double penalty and revocation of license 2nd offense; lack of equipment and failure to write name maximum \$10.; chains \$60.; not turning out properly maximum \$25.

	NEW YORK.	NORTH CAROLINA.
Registration.	Owners, manufacturers or dealers and chauffeurs must register with the Sec. of State.	No general State law concerning registration. Local authorities should be consulted.
Fees.	Owners \$2. Manufacturers \$2.; duplicate seals \$.50. Chauffeurs \$2. Licenses are perpetual.	
Numbers.	Not less than 3 in. high with initials of State not less than 1 in. high black on white ground on rear.	Numbers are required.
Lamps and Equipment.	2 1/2 white forward with numbers and 1 red reverse. Good brakes and suitable signal must be had.	Lamps must be provided.
Non Residents.	Exempt, if carrying own State credentials.	
Speeds.	Must always be reasonable. 10 m. business and built up sections; 15 m. houses averaging less than 100 ft. apart; 20 m. country; 4 m. curves, bridges and steep descents.	Counties are authorized to pass speed ordinances except New Hanover and Mecklenburg. 6 m. business sections; 10 m. other sections of towns; 15 m. outside. (Applicable only to Guilford, Wake, Wayne and Forsyth counties.)
Misc. Provisions.	Must stop upon signal from horseman. Upon approaching other travelers warning must be given.	
Penalties.	Speeding, failure to stop, numbers registration of chauffeurs, local regulations, \$100. maximum 1st offense; \$50. minimum, \$100. maximum or 30 d. or both 2nd offense; \$100. minimum, \$250. maximum subsequent offenses; other violations maximum \$25. 1st offense; \$25. to \$50. 2nd offense; \$50. to \$100. or 10 d. 3rd offense.	Violations made a misdemeanor and shall be fined not exceeding \$50. or imprisoned not over 30 days. Not applicable to counties of New Hanover and Mecklenburg.

	NORTH DAKOTA.	OHIO.
Registration.	No State law concerning registration. Municipal or local authorities should be consulted.	No State provision concerning registration. Municipal or local authorities should be consulted. The motor vehicle law passed by the State of Ohio is not operative because of an opinion of the Atty. Gen. that it is unconstitutional.
Fees.	No State law concerning fees. Municipal or local authorities should be consulted.	No State law concerning fees. Municipal or local authorities should be consulted.
Numbers.	No State law concerning numbers. Municipal or local authorities should be consulted.	No State law concerning numbers. Municipal or local authorities should be consulted.
Lamps and Equipment.	At least 1 suitable light. Bell or horn must be had, also a muffler.	At least 1 white light forward and 1 red light reverse. Good brake and suitable signal must be had.
Non Residents.	Exempt so far as State is concerned.	Exempt so far as State is concerned.
Speeds.	8 m. villages and cities; 15 m. elsewhere; 4 m. crosswalks or crossing when any person is upon same.	Must always be reasonable. 8 m. business and closely built up sections of municipalities; 15 m. elsewhere in municipalities; elsewhere outside 20 m.
Misc. Provisions.	Must sound alarm when approaching traveler from behind. Must stop upon signal from horseman when outside of cities.	Must stop upon signal from horseman.
Penalties.	\$5. minimum, \$50. maximum, or 5 d. minimum, 30 d. maximum, or both.	\$5. minimum, \$50. maximum.

	OREGON.	PENNSYLVANIA.
Registration.	Owners must register with the Sec. of State. No provisions concerning manufacturers or dealers and chauffeurs.	All operators must procure licenses from the Highway Department. The driver is registered and not the machine. Operators must be 18 years old.
Fees.	\$3. The license is perpetual.	\$3. The license is annual and expires Dec. 31st.
Numbers.	At least 8 in. high on dark background on rear with "Ore." following number.	Not less than 5 in. high in front and rear. No other numbers can be carried.
Lamps and Equipment.	At least 1 white light with number and 1 red rear. Must have muffler. Good brakes must also be had.	At least 1 white forward and 1 red reverse. Rear number must be illuminated. Good brake and signal device must be had.
Non Residents.	Exempt, if carrying own State credentials.	Not exempt.
Speeds.	Must always be reasonable. 8 m. thickly settled or business sections of cities and villages; 8 m. in country within 100 yds. of horse; outside thickly settled or business portions of cities and villages 24 m.; crossings within cities and villages 4 m. when any person is on same.	10 m. cities and boroughs; elsewhere 20 m.
Misc. Provisions.	Must stop upon signal from horseman.	Drivers must carry licenses and exhibit same upon request from officers. Must sound alarm before crossing intersecting highways.
Penalties.	\$25. maximum 1st offense; \$50. maximum 2nd offense; \$100. maximum succeeding offenses.	\$10. minimum, \$25. maximum 1st offense; \$25. minimum, \$100. maximum 2nd offense and revocation of license for not less than 6 months.

	RHODE ISLAND.	SOUTH CAROLINA.
Registration.	Owners or persons in control and manufacturers register machines with the Sec. of State.	Registration with Clerk of County Court where applicant resides. Manufacturers or dealers as such are exempt.
Fees.	Owners or persons in control \$2. Manufacturers \$10. The license is perpetual.	\$1. The license is perpetual.
Numbers.	Certificates of re-istration prescribes kind and manner of displayment of numbers.	Number and county name rear, black on white, not less than 3 in. high.
Lamps and Equipment.	"Such lights as shall be approved by said Secretary of State." Adequate brake, a muffler and suitable signal must be had. Lock must be provided.	1 white forward and 1 red reverse. Lights required in heavy fog. Good brakes and suitable signal device must be had.
Non Residents.	Exempt, if carrying own State credentials.	Exempt so far as the State is concerned.
Speeds.	No State provision concerning speed. Municipal or local authorities should be consulted.	Must always be reasonable. 6 m. crossings, bridges, sharp curves and steep descents; 15 m. elsewhere.
Misc. Provisions.	Must use care upon meeting horses and stop if necessary. Machines must not stand unattended without being locked.	Upon approaching other travelers warning must be given and must stop upon signal and if necessary.
Penalties.	\$20. maximum or 3 months.	\$10. minimum, \$100. maximum. or 30 d.

	SOUTH DAKOTA.	TENNESSEE.
Registration.	Owners must register with the Sec. of State. No provisions concerning manufacturers or dealers and chauffeurs.	Owners must register with the Sec. of State who gives certificate which must then be registered with County Clerk. No provisions concerning manufacturers or dealers and chauffeurs.
Fees.	\$1. The license is perpetual.	\$2. Sec. of State; \$1. County Clerk. License is perpetual.
Numbers.	Not less than 3 in. high on rear, with "S. D." not less than 2 in. high.	Not less than 3 in. high front and rear. No other number can be carried.
Lamps and Equipment.	One or more white forward and 1 red rear showing number. Good brakes and signal device must be had.	No State provision concerning lights.
Non Residents.	Exempt, if carrying own State credentials.	Not exempt.
Speeds.	Must always be reasonable. 10 m. closely built up sections of cities, towns and villages; elsewhere in cities, town and villages 15 m.; outside 20 m.	20 m. Municipalities are empowered to reduce rate.
Misc. Provisions.	Must stop if frightening animal and upon signal.	Must stop if frightening horse.
Penalties.	\$25. maximum 1st offense; \$25. minimum, \$50. maximum or 30 d. subsequent offenses.	\$25. minimum, \$100. maximum.

	TEXAS.	VERMONT.
Registration.	Owners must register with the County Clerk. No provisions concerning manufacturers or dealers and chauffeurs.	Registration with Sec. of State by owners, operators and chauffeurs and manufacturers or dealers.
Fees.	\$50. The license is perpetual.	Owners 20 hp. or less, \$3.; over 20 hp., \$5. Operator's or chauffeur's license \$2. annually; manufacturers', \$25.
Numbers.	Not less than 6 in. high to be displayed in conspicuous place.	Not less than 4 in. high, front and rear, with "Vt." not less than 2 in. high.
Lamps and Equipment.	At least 1 light, position and color not designated. Suitable signal must be had.	Such lights as the Sec. of State shall prescribe. Rear number must be illuminated. Brake, muffler and signal device must be had; also a lock.
Non Residents.	Not exempt.	Exempt, if carrying own State credentials and exemption is reciprocated by own State.
Speeds.	Must always be reasonable. 8 m. in built up sections of cities, towns and villages, except where higher rate is permitted; elsewhere 18 m.	Careless and negligent driving is prohibited. Over 25 m. outside incorporated cities and villages, exceeding 10 m. inside or thickly settled sections of towns shall be prima facie careless or negligent driving.
Misc. Provisions.	Must stop upon signal from horseman.	Must stop upon frightening animal. Machines must not stand unattended without locking them.
Penalties.	\$5. minimum, \$100. maximum.	Speeding \$50. maximum, 10 d. or both 1st offense; \$25. to \$200. or 6 m. or both subsequent offenses. Licenses may be revoked. Driving after revocation \$150. to \$200. or 10 d. or both. Other violations, maximum \$100.

	VIRGINIA.	WASHINGTON.
Registration.	Owners must register with the Sec. of State, but the law applies only to those counties adopting the act by vote of the Board of Supervisors. No provisions concerning manufacturers or dealers and chauffeurs.	Owners must register with the Sec. of State. No provisions concerning manufacturers or dealers and chauffeurs.
Fees.	\$2. The license is perpetual.	\$2. The license is annual and for renewals the fee is \$.50.
Numbers.	Not less than 4 in. high on rear, with "Va."	At least 4 in. high on rear, light on dark background, followed by "Wn."
Lamps and Equipment.	At least 1 white forward and 1 red rear, illuminating the number tag.	At least 1 white forward, showing red to the rear, white to contain numbers. Good brakes, suitable signal device and a muffler must be provided.
Non Residents.	Not exempt.	Exempt if carrying own State credentials.
Speeds.	12 m. corporate limits of cities or towns; outside 15 m., except curves, declines, intersections, crest of hills, passing vehicles where careful operation must be observed; 8 m. built-up sections of cities, towns or villages, curves, intersections in open country or where there is a gathering of horses or people.	Must always be reasonable. 12 m. thickly settled or business sections of cities and villages; 24 m. country; 4 m. crossings.
Misc. Provisions.	Must exhibit certificate to toll gate keepers and officers.	Must stop upon signal from horseman.
Penalties.	\$10. to \$100. or 5 to 30 d. or both.	\$100. maximum.

	WEST VIRGINIA.	WISCONSIN.
Registration.	State licenses granted by State Auditor to owners. No others than owners can legally be licensed.	Owners and manufacturers or dealers must register with the Sec. of State.
Fees.	\$10. duplicates \$1. The license is perpetual.	Owners, \$1. Manufacturers or dealers, \$5. The licenses are perpetual.
Numbers.	Front and rear, containing word "licensed."	3 in. high on rear, followed by "W."
Lamps and Equipment.	No State provision concerning lamps and equipment.	At least 1 light forward. Brakes and suitable signal device must be had.
Non Residents.	Not exempt.	Exempt. if carrying own State credentials.
Speeds.	No State provision. Local or municipal authorities should be consulted.	12 m. cities and villages; 25 m. elsewhere.
Misc. Provisions.		Must stop if frightening horse or upon signal, unless to do so will cause danger.
Penalties.	Defacing or destroying tag of another, \$5. to \$25.; \$20. to \$100. driving without tag; \$20. to \$100. driving without license, or 3 m. Failure to produce license, \$10. to \$100.	\$10. to \$100.

BRITISH NORTH AMERICA

	BRITISH COLUMBIA.	NEWFOUNDLAND.
Registration.	Owners must register with Superintendent of Provincial Police. Not applicable to manufacturers or dealers.	Machines owned in Electoral Districts of St. John's, East and West, must be registered with St. John's Municipal Council. Drivers must register annually. Persons under 17 years disqualified for driver's license, excepting machines under 5 hp., in which cases 14 years is the limit.
Fees.	\$2. annually.	\$5. except under 5 hp., in which case the fee is \$3.
Numbers.	Not less than 3 in. high on rear.	Mark indicating registered number must be fixed on rear in such manner required by the Municipal Council.
Lamps and Equipment.	A lighted lamp or lamps which must display numbers. Must have suitable alarm.	A lighted lamp or lamps. front.
Non Residents.	Not exempt.	Not exempt.
Speeds.	10 m. cities, towns and incorporated villages; 15 m. outside.	Must always be reasonable. 20 m. during day; 10 m. during night in and within 1 m. of cities, towns or settlements.
Misc. Provisions.	Must prevent frightening horses and stop upon signal.	Must stop in case of accident and give name and address. Must not be left standing unattended without locking.
Penalties.	\$25. 1st offense; subsequent offenses \$25. or 1 m.	\$50. maximum 1st offense; \$100. maximum 2nd offense; \$100. maximum or 1 m. subsequent offenses; failure to produce license \$25.; other violations \$100. maximum 1st offense; \$200. maximum or 3 m. subsequent offenses.

	NEW BRUNSWICK.	ONTARIO.
Registration.	Sec. Department of Public Works. Owners, manufacturers or dealers and chauffeurs must register.	Owners must register with Provincial Secretary. Lieutenant-Governor in Council may make regulations regarding renewals and transfers of permits, fees therefor and the registration of cars by manufacturers.
Fees.	Owners \$5. Manufacturers \$1. for duplicate seals. Chauffeurs \$2.	Fees not mentioned.
Numbers.	Rear 3 in. high, ½ in. wide, with initial letters of Province.	Not less than 5 in. high on front and back. No other numbers can be carried.
Lamps and Equipment.	1 or more white lights, showing number 1 in. high and ¾ in. wide. Efficient brakes and signal device must be provided.	A lighted lamp front and back lamp illuminating numbers. Searchlights not allowed. Lock must be had.
Non Residents.	Exempt if carrying own State credentials.	Not exempt.
Speeds.	1 m. 8 min. built up sections; elsewhere in city, town or village, 1 m. 5 min.; elsewhere outside, 1 m. 4 min.; bridges, sharp curves, steep descents, 1 m. 15 min.	Must always be reasonable. 10 m. cities, towns, incorporated villages; 15 m. outside; 7 m. approaching and passing horses.

	New Brunswick (continued)	Ontario (continued)
Misc. Provisions.	Must stop upon signal from horseman and in case of accident.	Must prevent frightening horses and stop upon signal. Machine not to be left unattended without being locked.
Penalties.	Penalties ranging from \$50. to \$200. are provided for first offenses, and imprisonment may be the penalty for subsequent offenses.	Numbers, racing, name and address in case of accident maximum \$50. 1st offense; \$100. maximum 2nd offense; 3rd offense 1 m.; other violations \$10. to \$50.

	QUEBEC.	SASKATCHEWAN.
Registration.	Owners, manufacturers or dealers, operators and chauffeurs must register with Provincial Treasurer.	Resident and non-resident owners must register with the Provincial Secretary.
Fees.	Owners \$5. Manufacturers or dealers \$10. Operators and chauffeurs \$5. Operators' and chauffeurs' licenses expire annually, April 1st.	\$10. The license is perpetual.
Numbers.	4 in. high, front and rear, with "Quebec" under numbers 4 in. high.	Not less than 5 in. high on rear.
Lamps and Equipment.	2 white forward with numbers and 1 red reverse. Good brakes and suitable signal must be provided. Must have lock.	"A lighted lamp or lamps" forward containing numbers. Proper alarm bell or horn must be had.
Non Residents.	Owners who reside in any other Province of Canada are exempt if vehicle indicates registration elsewhere. Residents of the United States are not exempted from registration and must furnish bonds unless relieved by Provincial Treasurer.	Not exempt.
Speeds.	6 m. cities, towns, villages; 15 m. other localities; 4 m. sharp curves, bridges, steep descents and crossings.	10 m. cities, towns or incorporated villages; outside 20 m.; 6 m. passing horses.
Misc. Provisions.	Must prevent frightening horses and stop upon signal. Must not leave machine unattended without locking.	Must prevent frightening horses.
Penalties.	Operating after license withdrawn \$100. maximum or 10 d. or both; other offenses \$20. minimum, \$100. maximum, 1st offense; subsequent offenses \$100. to \$200.; interfering with machine \$10. minimum or 6 m. or both.	\$50. maximum.

Touring Information

SHIPPING INSTRUCTIONS, CUSTOMS DUTIES, RULES OF THE ROAD.

Automobile touring has grown to such an enormous extent that practically all transportation companies here and abroad are making special efforts to obtain the business of tourists. This is particularly true of the big trans-Atlantic steamship lines, to which the tide of European travel falls. Each year the service rendered by these lines becomes more varied and complete, until now, in one or two cases, the tourist may entrust to them the task of receiving his car at his residence or garage and delivering it at any point and at any time desired. Almost without exception the transportation lines require the car to be properly boxed or crated; but it is now customary with some lines to do the work of crating also, for account of the shipper, while custom house brokers make a specialty of this work also.

Chief among the companies that make special efforts to secure the trade of this kind are the North German Lloyd, the Hamburg-American and the Cunard lines. The Hamburg-American requires, in addition to proper crating, that the tanks shall be free from all fluids. They require furthermore that any package weighing over two tons shall be loaded for shippers' account and discharged for consignees' account. To ports of call they accept a limited number of cars as passenger baggage, provided the owner accompanies the machine, and in such case the rate is 25 cents a cubic foot. The only steamer upon which they do not carry automobiles either as freight or as baggage, is the "Deutschland," as her hatches do not admit of doing so.

The North German Lloyd have gone farther than the other companies. They will undertake to crate or box a car, accepting it from the owner on their wharf and taking entire charge of it to the point of destination. They even go farther than this.

Generally speaking the cost of building the box and securing the car in it varies from \$55 for a touring car to \$65 for a limousine. As already stated it is advisable to turn this work over, together with all details of the shipment, to a reliable customs broker or express company who will see that the proper care is taken. The cartage fee to the steamer is usually about \$10 and the broker's commission for attending to the customs formalities, crating and registry in order to secure free re-entry is another \$10, making a total of from \$75 to \$85.

To motorists who wish to look after the crating personally the following information is furnished:

The best way to pack an automobile for shipment abroad is to build a closed box of matched timber around the car. The platform should be built on 2 x 4 braces, beveled at the ends. The sides, ends and top should be constructed on a lighter frame. Use heavy bolts to bind between platform and top, use at least four of these on each side. In addition fasten four iron bands upon the box extending diagonally from the lower corners to points near the lateral center of the sides. The upper ends of these bands terminate in eyes. Through the four eyes have a chain placed. This will give a center hold to which hoisting tackle can be fastened. Brace wheels by blocks fastened to the sides of the box and brace smaller boxes containing spare parts to the platform of the box. The box can be left with forwarders after the outward passage, for use in returning.

Under a decision of the Treasury Department, upon re-importation of cars previously exported, if repairs exceeding in amount 10 per cent of the original cost of the car have been made, while abroad, the car is liable to duty at its full value. It is quite immaterial under this ruling whether the repairs were necessitated by accident or otherwise. If the car is of foreign make, therefore, have it examined before shipment by the United States customs authorities so as to avoid trouble and delay upon its re-importation.

A passport from the United States Government is a good thing to have, though not absolutely necessary. It can be secured by writing to the Passport Bureau of the State Department at Washington for blank. When received, fill and return with fee of \$1. Enclose no return postage; government franks. Passports are good for two years and are renewable. A triptyque (frontier pass) entitles a tourist to cross and recross a frontier any number of times (except in Germany), but the endorsement of exportation should be made by the customs officials only upon final departure from a country.

It should be remembered that while speed laws are not rigidly enforced except in Switzerland, all drivers should be reasonable in their handling of cars. Road rules should be strictly observed everywhere.

It is best to be sure that one has coin of the country which is about to be entered before reaching the frontier. Cus-

Touring Information (Continued)

toms officers will accept nothing but money of their own country. Before leaving it is always advisable to notify the frontier station a day or two before reaching it, so that the officials may have time to secure sufficient funds for reimbursement. Ordinarily they do not keep much money on hand.

Throughout Europe the rule is: Automobiles and motor cycles, horns; bicycles, bells. By this the driver knows what is approaching from the rear and can govern himself accordingly.

It is always essential to carry an exhaustive makers' certificate showing make and type of car, number of car and motor, weight, specifications, value, capacity and details of parts. Complete answers to these items are necessary in obtaining licenses and triptyques in France, and are useful for like purposes in Italy and Germany. A certificate of ability as a driver is indispensable.

Never pass or cross in front of a policeman or other official. The dignity of the law is sacred in Europe. Be polite to all officials under all circumstances; you will gain by this. Generally, you will find the officials overpoweringly polite to you.

Guide books can be obtained in book stores in any of the large cities of Europe. Baedeker's are standard and generally up to date. Rolfe's "Satchel Guide" is also good. Cooks' and Gazes' tourist agencies also publish reliable hand-books. And there are other good publications. Both the Michelin and Continental tire concerns publish guides which give much information not otherwise found in repair stations, garages and fuel depots. Good maps are plentiful and not expensive. The sectional ones are particularly good in Europe. Never travel without a map, as local information is not always reliable.

On arrival at a town, leave your car and make hotel and garage arrangements before any of your party dismounts or any baggage is taken out. The fear that you may go to another hotel will insure better terms from the hotel and garage people.

Be good-natured but firm. Be just in giving gratuities; not too liberal. Too much generosity makes it harder for those who follow. Plan your itinerary in advance, but allow a day here and there for departures from it.

Following is detailed information regarding the formalities and regulations of the countries most visited by tourists:

France.—Nine-tenths of the tourists in making up an itinerary of European travel start from France, and strangers

Touring Information (Continued)

can avail themselves of the services of the Touring Club of France and of the Association Générale Automobile (an adjunct of the Automobile Club of France) in the following manner:

The cost of membership in the Touring Club of France is 6 francs (\$1.17) and can be secured, through arrangements between the T. C. F. and the Automobile Club of America and the American Automobile Association, in the one case by presentation of certificate of membership in the A. C. A. and in the latter by written request stating membership in the A. A. A. and upon payment of the annual fee.

The T. C. F. can arrange for the deposit of the customs duties of the several countries about to be visited and can issue a triptyque. The deposit will be returned by the club at the end of the tour. Thus all duties can be paid in a lump sum, eliminating all frontier delays and troubles, and collected upon return. If the tourist knows what his plans are a couple of months in advance all this can be arranged before leaving this country.

The Association Générale Automobile also can issue the triptyques to its members, as well as confer several additional favors. Membership costs 10 francs per year and application blanks can be secured through the A. C. A. or the A. A. A. The association will furnish reliable chauffeurs, and is also empowered to issue temporary driving licenses. To secure this license is one of the first and most important items to attend to on arrival.

Ordinarily this will involve a delay of two or three days, according to the idea the official has of the value of time or his inclination to work. The A. G. A. is empowered by the national authorities to hold examinations and grant temporary operating licenses, which can be exchanged at leisure for the official document. A stranger arriving would present himself at the association headquarters with his car, a few unmounted photographs of himself, and the necessary documents to prove his identity. Immediately an examiner takes him in hand, and, if satisfied with his ability to handle an automobile, grants him a certificate which will be accepted by any sergeant de ville or gendarme in France, or almost every other country of Europe. When the clerks in the Mining Department have gone through their routine papers will be forwarded, probably three weeks later. If a member of the Association Générale Automobile, you can obtain a chauffeur whose ability has been proved and whose moral character is vouched for by that

Touring Information (Continued)

body. The A. G. A. keeps close watch over the men it recommends, causes them to report to headquarters whenever out of employment, and withdraws their diploma on any proved case of misdemeanor.

Further advantages of the association are information on tours, maps, etc., a discount on tires, spare parts, etc., by arrangement with a number of firms.

The French customs on cars weighing 125 kilos (275 lbs.) is 120 francs per 100 kilos. On cars weighing more than 125 kilos a deposit of 50 francs (\$10 per 220 lbs.). Average deposit: Touring cars, \$175; limousines, \$200. Money refunded when leaving, if within one year. French cars are free of duty on presentation of certificate issued by the customs officials at the time of original export, this is good for one year and is renewable, but as there is much red tape in connection with securing free entry it is advisable to pay the duty and have it refunded.

Great Britain and Ireland.—No duty. Observe road rules carefully. Remember to turn to left in passing instead of right. Some roads are closed to motorists, most frequently in Scotland. Roads are good and carefully signposted. Speed 20 miles, except where special notices are posted. Driver must be over 17 years of age. Two white lights in front, one red in rear; loud sounding horn. Two registration plates must be procured, to attach both front and rear.

For registration of car cost 20/-, driver 5/- and owner 5/-. An inland revenue tax of £4 4/- is imposed on cars weighing over one ton; 15/- for employing male servant. This tax is often ignored by tourists who remain in England only a short time. Inland revenue tax can be paid at any postoffice. Driver's license and registration taken out in important towns only; London, at Spring Gardens, County Council, or Westminster; Southampton, Town Hall; Liverpool, municipal offices; Canterbury, if landing at Dover or Folkestone. Lewes, if landing at New Haven; Ipswich, if landing at Harwich. The Motor Union, 1 Albemarle street, London, membership is valuable for information; fee, \$5.25.

Germany.—Customs imposed on entrance, and refunded on departure. If departure is from some small town, refund is invariably refused and tourist must apply to some main office (which may be many miles away) to secure it. It is advisable to have a triptyque from the Touring Club of France or Italy to avoid this difficulty. Tax is collected at frontier, 15 marks for 5 days', and 40

Touring Information (Continued)

marks for 30 days' permission to travel in country. A foreigner's home permit to run his car, and his driving license must be viséd by a German Consul before he can enter. Plate with number will be furnished (cost 6 to 10 marks). All foreign numbers must be removed.

Keep to right, pass to left. Inquire carefully in each city what roads are closed to automobilists. Speed signs posted, 15 kilometers (9½ miles) allowed in built up sections, greater in country.

Italy.—Duty from 200 to 600 francs, returnable (insist on having return made in gold) on leaving country. Duty on touring car or limousine about \$120. License to drive easily procured. Within four days after crossing frontier, make a declaration at the office of some Provincial Prefect. This four-day term is established by the toll-gate certificate. If tourist comes from some country where there are rules and regulations for the driving of automobiles, as in America, he will receive a temporary permit to drive in the kingdom. He must prove ability to drive, ownership, etc. Lead seals will then be placed on the car.

Membership in the Touring Club of Italy is helpful in securing necessary papers, maps and touring information. Cost of membership, 10 lire (\$1.94). Two headlights necessary, left green and right white, rear light to show number. Number of permit to be attached both front and rear. Speed 12 kilometers (7½ miles) in built up sections, 40 kilometers (25 miles) in open country. In general, keep to the right and pass to the left, but in some provinces, notably Rome and Genoa, the rule is reversed, and only by excessive care can accident be avoided.

Spain.—Deposit on entrance, returnable at departure, if within six months. Road and speed rules not severe.

A circulation permit for the car should be obtained from the Civil Governor of the province, and a driver's certificate from the police authorities. Keep to the right, pass to the left.

Austro-Hungarian Empire.—Customs duty is collected on frontier and refunded on departure. Numbers and letters are assigned on entry and must be carried both front and rear. Letter Z in red, must also appear on plate, in addition to letters assigned. Two white headlights necessary. Tourist not obliged to secure driving license if he can produce certificate from his native State or country. Speed from 15 kilometers (9½ miles) in villages to 45 kilometers (28 miles) in country. Must not exceed 6

Touring Information (Continued)

kilometers (4 miles) in foggy weather, at sharp turnings, on bridges, etc. Keep to the right and pass to the left in the following provinces; Tyrol, Carinthia, Istria, Carniola (Krain) and Dalmatia. Keep to the left and pass to the right in all other provinces. It is advisable to notify the authorities of the custom house in advance of leaving, otherwise some of the small frontier stations may not have the refund money on hand.

Denmark.—No duty on declaration that car is temporarily imported for touring purposes.

Two white headlights and horn necessary. Keep to the right, pass on the left. Some streets and roads forbidden to automobiles. Car must be declared to the police of place of entry who will provide number and letter on plate. License of native country or State necessary.

Russia.—Automobiles may not pass the frontier simply by depositing duties, but special permission must be secured from the Secretary of Finance. Such permission must be applied for in writing on paper stamped with two stamps of 80 kopecks (41 cents) each. Since reply may be delayed, it is expedient to ask for an early answer, giving some urgent reason. Driver must declare by which custom stations car is to enter and leave the country and for what space of time a permit is sought. The reimbursement takes place from two to ten months after leaving. Local road and speed rules not generally severe.

Keep to the right, pass to the left. A passport is necessary, and must be viséd by a Russian Consul. Driving certificate should be obtained.

Holland.—For temporary importation there is no well established regulation, but tourists usually enter free, depending mostly on the good will of the officials. A license good for eight days can be secured at point of entry. For a longer stay apply to the Minister of Public Works (Minister van Waterstraat) at The Hague, at least three weeks in advance, stating the greatest length and width of the car, whether steam, gasoline or electric, and date and place of arrival. Enclose one guilder (40 cents) to cover stamp duty. Travelers will then have no trouble, and the necessary permit will be ready for them on arrival, together with a copy of the rules and regulations.

Two white lights and loud horn or bell are necessary. Speed, 20 kilometers (12 miles) in country and 8 kilometers (5

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miles) in villages. All prohibited roads are posted.

The above permit is good only on State roads, and not those belonging to provincial or municipal governments. To travel in the provinces of Zealand, Northern Holland, North Brabant or Friesland, additional permits must be secured from each.

Switzerland.—Deposit of 60 francs for every 100 kilos gross weight of car required. Against the deposit, a permit is given, valid for one year. The deposit is returned on leaving Switzerland by any of the frontier stations in exchange for the permit. Regulations are very exacting in Switzerland and motor drivers are not popularly liked. To escape owners' permits and plates, etc., tourists must carry permits of their home country, and that country must be one between which and Switzerland reciprocity exists. Each car must carry a deep-sounding horn. The driver must sound this as soon as he intends crossing or overtaking another car, a cycle or pedestrian crossing the road. He must also use the signal at all sharp turns in the road or at the end of any private road or avenue leading into a public highway; also at night or in foggy weather. A car must carry two brakes, which must be used on sloping ground. The brakes must be independent and each must be competent to stop the car at full speed and full power on any incline. At night all cars must carry two lanterns in front, one green, the other white; also a red light at the rear, which must be lighted even if the vehicle is standing still. The driver must have perfect control of his car at all times. He must slow up or even come to a full stop whenever the vehicle might cause an accident or interfere with traffic or when a saddle or harness horse shows signs of fright. In cities, villages, or hamlets and on mountain roads, speed must never exceed 10 kilometers (6¼ miles) an hour. On bridges, narrow streets, on steep declines and in front of signboards and official posters, speed must be reduced to 6 kilometers (4 miles) per hour. On no account must the speed be increased to more than 30 kilometers (19 miles) in the open country.

Bohemia.—A car brought into Bohemia may be used 14 days without restriction. After that it must be examined by a commission appointed by the chief court of administration at Prague. Cost of examination 120 crowns (\$24.36). Persons driving in Bohemia more than

Touring Information (Continued)

eight days must secure license at Prague or Reichenberg, cost 50 crowns (\$10.15). Speed 9 miles in towns and 28 miles in the country.

Belgium.—Duty is 12 per cent ad valorem, returned upon leaving the country. Permit received is valid until December 31 of that year. Permits granted in November or December are good till October 31 of the following year. Amount of duty is large, and use of the T. C. F. triptyque is advised. Numbers are assigned at most important cities and plates must be carried on both front and rear of cars, the latter being illuminated at night.

Speed, 10 kilometers (6¼ miles) in settlements and 19½ miles in open country. Keep to the right and pass to the left.

Norway.—Duty 15 per cent ad valorem, returned when the car is taken out of the country. A certificate stating the value of the car, signed by the mak-

Touring Information (Continued)

ers or their agents should be produced. A lead seal is affixed to the car at the Custom House. Fees for receipts, seal, etc., amount to about \$1.50. License number is furnished by the police, and must be carried both front and rear. Two headlights and one red light in rear must be carried. Speed must at all times be compatible with public safety. Keep to the right, pass to the left.

Sweden.—Duty 15 per cent ad valorem, returnable when leaving the country. Proof of ability to drive a car must be furnished. Special regulations are in force in Stockholm, where many streets are closed. Keep to left and pass to right. Speed from 15 to 25 kilometers per hour.

To supplement the foregoing, and to put the matter in convenient form for reference, the following tables are given. They cover the regulations of all the principal European countries where automobiling is done.

Automobile Regulations in Force in Europe.

NATION	Side to be Kept in case of Meeting of Vehicles	Lighting of Automobiles	Legislation Peculiarities
AUSTRIA	LEFT	A lamp with white glass.	No general regulation. In Lower Austria the police regulation is in force. A permit to drive is required.
BELGIUM	RIGHT (decree) except at Gand. LEFT (communal regulation.)	A lamp in front and rear. (decree) At Gand a supplementary lamp in front and colorless glasses are required by virtue of a communal regulation.	Laws and decrees, but modifiable in a certain measure by the Burgomaster, who has nearly the same authority as French Mayors. A number in front and rear is required. Speed permitted is 30 kilometers in the country and 10 in cities and villages.
DENMARK	LEFT		The driving of automobiles on the streets of cities is prohibited, and is permitted in the country only upon the national roads.
FRANCE	RIGHT	Two lamps in front, one white and the other green.	The front of the car must carry a plate 4 inches in height on which are painted in white figures on a black ground a registration number and letters designated by the Chief of Mines. The rear of the car must carry a plate 6 inches in height on which the figures and letters are painted in white on a black ground. The letters and figures must be separated by a horizontal line. The plate must be illuminated at night by reflection or by the light of lamp shining through an opalescent glass covered by an open work plate carrying the letters and figures. The speed must be reduced to that of a pedestrian in narrow passages and encumbered places. In no case must the speed exceed 30 meters per hour in cities and villages.
GERMANY	RIGHT (Communal regulations in general)	One lamp. (Communal regulation in general.) At Darmstadt, colored glass is prohibited.	No general regulation. Maximum speed in cities and villages, 12 kilometers. In Southern Germany, Bavaria, Saxony, and a few cities of Northern Germany, a plate and number are required. At Darmstadt a permit to drive is required for a sojourn of more than 8 days. At Munich, a permit is required for carriages. The running of motor cycles is absolutely prohibited.

Touring Information (Continued)			Touring Information (Continued)
NATION	Side to be Kept in case of Meeting of Vehicles	Lighting of Automobiles	Legislation Peculiarities
GREAT BRITAIN	LEFT	A white lamp in front and a red one in the rear on the right side (law). The county councils can add any measures in their districts.	15 kilometers in the country, and at the speed of a pedestrian in cities. It is forbidden to keep at home or to carry in an automobile more than 180 litres (45 gallons) of gasoline.
ITALY	RIGHT in the country and in villages. LEFT in large cities.	Two lamps in front, the one to the left with a green glass; and one lamp in the rear with a red glass.	A permit to drive is required in case of a sojourn of more than eight days. Maximum speed 12 kilometers.
LUXEMBURG	RIGHT	No regulation for automobiles.	
NETHERLANDS	RIGHT	Two lamps in front.	Two permits to drive have to be obtained; one of them from the Minister of Public Works for the roads kept in repair by the State, and the other from the permanent delegation of the states of the Province of Zealand for the other public roads. A number is necessary in front and behind. Maximum speed 20 kilometers, reduced to 8 in descents, curves, and cities and villages. At Amsterdam, a third permit to drive is required by the municipal authority. It is forbidden to carry more than 5 litres (5 quarts) of gasoline and this must be placed in a metal tank covered with asbestos. The owner of the carriage is responsible for the driver.
SPAIN	RIGHT		Same regulations as in France. 28 and 12 kilometers.
SWITZERLAND	RIGHT		The driving of automobiles on certain highways and in the entire Canton of Valais is forbidden. There is no general regulation. The legislation is very variable according to the Canton. Numbers required in some of them. Speed must be very moderate.

Miscellaneous Information

PROPOSED UNITED STATES AUTOMOBILE LAW.

A Federal automobile bill was introduced in the 59th Congress and again in the 60th Congress, where it is still pending. The measure, which is entitled "A bill providing for the regulation, identification and registration of motor vehicles engaged in interstate travel," was prepared by the Legislation Board of the American Automobile Association, of which Charles Thaddeus Terry is chairman. Its passage is being strongly advocated by automobile associations, clubs and individuals. The text of the bill follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the term "motor vehicle," as used in this Act, except when otherwise expressly provided, shall include all vehicles propelled by any power other than muscular power, except motor bicycles, motor cy-

cles, road rollers, fire engines, police patrol wagons, ambulances, and such vehicles as run only upon rails or tracks. The term "State," as used in this Act, except where otherwise expressly provided, shall include the Territories and the Federal districts of the United States.

Sec. 2. That the provisions of this Act shall apply to any motor vehicle operated and driven from one State to any other State of the United States, or from any State in the United States to an adjacent foreign country, and operated and driven from such place to any other place in the United States: Provided, That the provisions of this Act shall not apply to motor vehicles when operated and driven wholly within the State which is the residence of the owner of such vehicle and not engaged in interstate travel as aforesaid: Provided further, That nothing in this Act shall be so construed as to conflict with the

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laws of any State in regard to the regulation of motor vehicles, except that, upon compliance with the provisions of this Act by an owner of a motor vehicle, such motor vehicle shall be exempt from the provisions of State laws in reference to the registration of motor vehicles, but such motor vehicles shall not be exempt from any of the provisions of the law of the State which is the residence of the owner of such motor vehicle.

Sec. 3. That every person hereafter acquiring a motor vehicle which may be engaged at any time in interstate travel, as aforesaid, and every person who has acquired or is the owner of a motor vehicle at the time of the passage of this Act, and who desires to take advantage of the provisions hereof, shall cause to be filed, either by mail or otherwise, in the office of the commission constituted and appointed under the provisions of this Act, upon the payment of the registration fee of five dollars, a verified application containing—

First. A brief description of the vehicle to be registered, including the name of the manufacturer, the manufacturer's number of the motor vehicle, if number there be, the character of the motor power, and the amount of such motor power stated in figures of horsepower.

Second. The name and address of the owner of such motor vehicle and the State in which he resides, with a statement that such owner has complied with the provisions of the law of the State of his residence, if any, made and provided by the legislature thereof in regard to—

(a) The said owner's right to operate and drive the said motor vehicle within the boundaries of that State.

(b) The registration and identification of the said motor vehicle.

Third. The registration number assigned to such motor vehicle by the officers of the State in compliance with the State law.

Sec. 4. That upon the filing and approval of the bureau, as hereinafter constituted, of an application, as hereinbefore provided, the bureau, or its duly authorized agent, shall assign to such motor vehicle, as described in such application, a distinctive number, and shall issue to the owner of such motor vehicle, under the seal of such bureau, a certificate of registration of such motor vehicle, as it is described in the application as filed, which certificate shall contain the distinctive number, as assigned to such motor vehicle, the name of the State of his residence, a brief description

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of such motor vehicle, stating the name of the manufacturer, the manufacturer's number, if there be one, the character of the motor power, and the amount of such power stated in figures of horsepower, and the distinctive registration number assigned to such vehicle, pursuant to the law of the State in which such motor vehicle had previously been registered, if any.

Sec. 5. That every motor vehicle registered in accordance with the provisions of this Act shall have the distinctive number assigned to it by the commission, as hereinafter constituted, displayed on the front and on the rear of such motor vehicle as an identification mark, and it is further provided—

First. That such distinctive number shall be exhibited separately and apart from any such number displayed in accordance with the provisions of the law of the State under which such motor vehicle shall have previously been registered.

Second. That such distinctive number, as an identification mark, shall consist of a white placard as a background, upon the face of which shall appear the distinctive number assigned to such vehicle by the commission, as hereinafter constituted, in black Arabic numerals, such numerals to be not less than three inches long, nor each stroke less than one-half inch in width, such number to be preceded on the placard by the initial or abbreviation of the State under the laws of which such motor vehicle has previously been registered, in black letters, each letter to be at least one inch and a half in height, and such number to be followed on the placard by the letters "U. S.," each letter to be of the same size and character as the letters of the initial or abbreviation of the State as hereinbefore provided.

Third. Every motor vehicle registered under the provisions of this Act shall at all times between sunset and sunrise carry and bear at least two lighted lamps, one on the front of such motor vehicle and one on the rear of such motor vehicle, the rays of which rear lamp shall shine upon and illuminate each and every part of the said distinctive number borne upon that part of the motor vehicle, and the light of which lamps shall be visible at a distance of at least two hundred feet in the direction in which the vehicle is proceeding and an equal distance in the reverse direction, respectively.

Sec. 6. That in the event of a violation of any of the provisions of this Act by an owner or operator of a motor vehicle registered as hereinbefore pro-

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 vided the following consequences shall ensue, that is to say—

First. Such owners shall be deemed to have forfeited all registration fees paid by him in accordance with the provisions of this Act and to have forfeited all rights and privileges granted hereunder, and such registration as may have been had theretofore under the provisions of this Act of any motor vehicle owned or controlled by such owner shall become null and void and of no effect immediately upon such breach or default by such owner.

Second. No such owner may, at any time thereafter, register any motor vehicle owned and controlled by him, or which he may afterwards acquire, in the office of the commission under the provisions of this Act; and the commission is expressly prohibited from accepting and filing the application of such owner for registration under the provisions of this Act of any motor vehicle owned or controlled by him except upon the performance of the following conditions, to wit:

(a) The payment by said owner of a penalty fee of twenty-five dollars.

(b) The filing of a new verified application for each motor vehicle owned or controlled by such owner, as hereinbefore provided.

(c) The payment by such owner anew of such registration fees as are provided for herein.

Sec. 7. That in the case of a manufacturer or dealer in motor vehicles, such manufacturer or dealer shall make application for the registration, in the same manner as is herein before provided, of each style or type of motor vehicle manufactured or dealt in by such manufacturer or dealer. Whereupon, upon the payment of a registration fee of ten dollars, there shall be assigned to such style or type of motor vehicle a distinctive number as an identification mark, which shall be carried and displayed by every motor vehicle of such style or type registered in the manner hereinbefore provided, and there shall be issued to such manufacturer or dealer a certificate of registration, as hereinbefore provided, for each such style or type of motor vehicle and as many certified copies thereof as may be desired upon the payment of a fee of fifty cents for each such copy.

Sec. 8. That in the event of the sale or the letting for hire for a period of over ten days of any motor vehicle registered in the office of the commission, as hereinafter constituted, in accordance with the provisions of this Act, such registration shall become null and void

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 within five days after such event, and the vendor or lessor of such motor vehicle shall immediately upon such event return the certificate issued to him upon the registration of such motor vehicle, for cancellation, with a verified statement that such motor vehicle has been sold or let for hire for a period of over ten days. In case the purchaser or lessee of such motor vehicle should desire to bring such motor vehicle again within the provisions of this Act, he shall thereupon, in conformity with the provisions hereof, register such motor vehicle anew and procure a certificate upon the payment of the fees and the filing of a verified application, as hereinbefore provided, which shall state among other things the name of such vendor or lessor.

Sec. 9. That if any motor vehicle shall display an identification mark or number which purports to have been assigned to such vehicle, pursuant to the provisions of this Act, but which is fictitious or which such motor vehicle has no right to display, the following consequences, in addition to those provided for in section five hereof, shall ensue, that is to say—

First. Every motor vehicle owned or controlled or afterwards acquired by the owner of such offending motor vehicle shall be denied registration within the provisions of this Act for a period of five years.

Second. Such motor vehicle and all other motor vehicles owned and controlled by the owner of such offending motor vehicle, if previously registered as hereinbefore provided, shall, nevertheless, immediately become amenable to all the provisions of the law of the State in which such offense is committed, and the registration of such motor vehicle in accordance with the provisions of this Act shall immediately become null and void.

Sec. 10. That every person who shall own or operate a motor vehicle registered under the provisions of this Act shall be ready at all times, while such motor vehicle is engaged in interstate travel, to exhibit the certificate issued to him upon the demand of the proper authorities, either of the State or United States Government: Provided, however, That in the event that such certificate has been lost or mislaid, such owner or operator shall sign an affidavit setting forth the name and address of the affiant, the fact of such loss or mislaying of the certificate, the contents of such certificate, and the fact that such motor vehicle has been registered in the office of the commission as hereinafter consti-

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tuted, in accordance with the provisions of this Act, and deliver such affidavit to the authority making the demand; and upon the making and delivery of such affidavit to such authority the owner or operator shall be relieved of penalty for the mischance: Provided further, That upon the discovery of the loss of such certificate the owner of such motor vehicle shall immediately notify the office of the commissioner of such fact. Whereupon such commission shall issue to such owner a duplicate of such lost certificate upon the payment of a fee of one dollar.

Sec. 11. That a bureau is hereby created and established in and to be a part of the Department of Commerce and Labor to be known as "Motor vehicle bureau," which shall be composed of a commissioner who shall be appointed by the President, by and with the consent of the Senate, together with an assistant and a clerical force as hereinafter provided.

First. The commissioner shall serve for a term of five years and until his successor shall have been appointed and qualified, but the commissioner may be removed by the President for inefficiency, neglect of duty, or malfeasance in office.

Second. Such commissioner shall appoint a secretary, who shall serve at his pleasure and whose duty it shall be to keep full and faithful record of the proceedings of such bureau, preserve at its general office all documents and papers entrusted to his care, prepare for service such papers and notices as may be required of him by the commissioner, and perform such other duties as the commissioner may prescribe.

Third. Such commissioner may also appoint and at his pleasure remove such additional clerical officers as may be necessary for the transaction of the bureau's business.

Fourth. The office of the bureau shall be in the city of Washington, District of Columbia, in rooms in an official building, which shall be designated by the proper authorities.

Fifth. Such commissioner shall be empowered to adopt such rules and regulations as shall be necessary to carry into effect the provisions of this Act. Such commissioner shall have power to issue certificates and suspend and nullify the same as herein provided.

Sixth. Upon the receipt of an application for registration of a motor vehicle or motor vehicles, as hereinbefore provided, the commissioner shall thereupon file such application in his office and register such motor vehicle with the

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name and address of the owner thereof, and the facts as stated in the application, in a book or index to be kept for such purposes, under the distinctive number or identification mark assigned to such motor vehicle, by such commissioner, according to the provisions of this Act, satisfy himself that the verified statement made in such application is correct, and issue to the applicant a certificate as hereinbefore provided. The book or index in which motor vehicles are registered, as hereinbefore provided, shall be kept by the commissioner at his main office and shall be open to the inspection of any person during reasonable business hours. Upon the application of any person, by mail or otherwise, any information within the knowledge of the commissioner in reference to any motor vehicle registered in accordance with the provisions of this Act shall be furnished to a reasonable extent by the commissioner to such person applying, free of charge.

Seventh. Any person, firm, corporation, or association, or any mercantile, agricultural, or manufacturing society, or any body politic or municipal organization, complaining of anything done or omitted to be done by the owner of any motor vehicle, subject to the provisions of this Act, in contravention of the provisions thereof, may apply to the commissioner by verified petition which shall briefly state the facts. Whereupon, a statement of the charges thus made shall be forwarded by the commissioner to the owner of such motor vehicle, who shall be called upon to answer the same, by a verified statement in writing, within a reasonable time, to be specified by the commissioner. If the owner of such motor vehicle shall not answer the complaint, as hereinbefore provided, within the time specified, or there shall appear to be any reasonable ground for investigating the said complaint it shall be the duty of the commissioner to investigate the matters complained of in such manner and by such means as he shall deem proper. If, upon such investigation, the commissioner shall find the violation complained of was committed, such commissioner may suspend or nullify the registration of all motor vehicles owned and controlled by the owner of the motor vehicle complained of, and impose such terms or conditions upon any new registration by such owner as it shall deem proper, in addition to those already provided for.

Eighth. The revenue derived from this Act shall be appropriated to the payment of the expenses of the bureau, and such surplus as there may be shall be

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paid into the Treasury of the United States of America. The expenses of such bureau shall consist of the salaries of the commissioner, the secretary, and the clerical force, and such expenses as shall be necessary to carry into full force and effect the provisions of this Act. The commissioner shall have a salary of five thousand dollars a year, payable quarterly. The secretary of the commission shall have a salary of two thousand dollars a year, payable in such manner as the commissioner may prescribe. The salary of any single member, of the clerical force shall not exceed the sum of one thousand two hundred dollars a year. The commissioner shall submit to the Secretary of the Treasury semi-annually a full report of the revenues and receipts and the expenses of such bureau.

Sec. 12. That this Act shall be known as the "Motor vehicle Act," and shall take effect thirty days after its approval by the President.

FRENCH ROAD RULES.

Rules adopted by the Automobile Club of France and Alsace-Lorraine, the League of Chauffeurs, the Touring Club, the Federation of Regional Automobile Clubs, the Moto-Club, etc.:

Art 1.—On an automobile road it is permissible to occupy the center of it provided space enough be allowed to the left to permit of the passing of a faster car going in the same direction.

Art 2.—Passing of two cars.—(a) Two cars running in opposite directions pass each other in each keeping to the right. When the road is manifestly too narrow to allow the vehicles to pass each other easily, they must slow up. The speed must even be reduced to that of a pedestrian if the road is such as to render the passing difficult. (b) If two cars are running at a different speed in the same direction, the one behind has only to keep to the right. The car going to the front must make its presence known by sounding the horn and not attempt to proceed unless it is plainly seen that there is sufficient space. (c) A driver must never exceed the speed of a carriage in traversing rural settlements.

Art 3.—Turns.—(a) In exposed turns, that is to say, where there is a clear view of the entire extent of the turn, there is no special necessity for slowing up. (b) In any turn where any portion of the road is hidden from view, the driver must slow up so as to be able to stop at ten yards. This is particularly necessary in a mountainous district. (c) In case of absolute impossibility, say if the right side of the road is obstructed

French Road Rules (Continued)

by some obstacle, the driver obliged to take the left side will have to proceed slowly enough to be able in case of necessity to stop within three yards at the most, and to signal continually with the horn.

Art 4.—Crossing of Roads.—(a) If a road crossing is absolutely exposed, that is to say, if the view is not interfered with by anything, there is no necessity of modifying the speed if the road is clear. If two cars are converging toward the open crossing, the driver who observes a car approaching toward his right must make way for it, whatever be the relative width of the roads; and must therefore slow up, and if need be, stop. (b) If the crossing is such that the view is impossible, or even only interfered with, every car approaching it must reduce its speed to at least twelve miles an hour. If, on reaching the crossing, with speed thus reduced, two cars suddenly come in sight and run the risk of colliding with each other, each driver should invariably turn to the right, even should such a measure cause him momentarily to abandon his route.

Art 5.—Passing through cities and villages.—(a) In passing through cities special rules will be observed. (b) In the case of villages the speed will always have to be sufficiently reduced to permit of a stop in ten yards if the road is wide, and in three yards if it is narrow. The use of the horn is obligatory on approaching isolated houses.

Art 6.—Meetings.—In approaching human beings and animals, they must be forewarned by sounds of the horn until their attention has been manifestly attracted, and, if the road is narrow, the speed must be sensibly reduced. If the animals exhibit fright, the car must, in all cases be slowed up, and, if necessary be stopped, and the motor also.

Art 7.—Accidents to Persons.—In case of accident the driver must stop and render the victim or victims all the aid possible. After the injured have been cared for and medical aid has been assured them the driver should at once gather all the testimony capable of throwing light upon the causes of the accident.

Art 8.—An automobile passing at the time of the accident, should likewise stop in order to offer the completest assistance to the injured in the first place and then to those who caused the accident, which is always presumed to have been unavoidable.

Art 9.—Damages, break-downs, and accidents to the car.—(a) Every driver should render aid to a fellow-automobilist who requires it of him. (b) An auto-

French Road Rules (Continued)

mobilitist in distress asks help in the following manner: 1. If it is daylight, by waving one arm in a plane at right angles to the road his face turned toward the car which he is begging to stop, or by placing conspicuously upon the car a white flag, for which, at a pinch, a handkerchief can be employed; or 2. If it be night, by swinging one of the lamps across the road.

Art 10.—In case of running short of gasoline, the driver from whom a supply is requested should furnish such a quantity as he has to spare. For such gasoline cost must be paid.

ENTRY OF TOURISTS' CARS INTO CANADA.

In the summer of 1907 an arrangement was effected whereby the difficulties theretofore attending the entry of United States tourists into Canada were largely done away with. Under this arrangement automobilists living in the United States may enter and tour Canada with their cars without trouble and at a very small cost—special bonding arrangements having been made by brokers in various Canadian points with the Canadian Department of Customs rendering this possible.

No cash deposit is required, and the permit which is supplied allows the car to run about in Canada and to enter and leave the country at any point as often as desired until the end of the year without interference or delay.

AUTOMOBILES ON FERRIES.

The carriage of automobiles on ferry boats or other passenger steamers in the United States is regulated by the national government. The Federal statute forbidding the carriage of inflammable materials was modified, after a long agitation by automobilists, by an act passed by Congress and approved February 18, 1905. Under its provisions the clause in the statute, which rendered it mandatory upon owners or operators of steam vessels to have "fire" extinguished before permitting motor vehicles to be driven or run upon such vessels, was changed in a manner that would permit them to be run on and off the vessels under their own power. The clause, as changed, reads as follows:

"Nothing in the foregoing or following sections of this Act shall prohibit the transportation by steam vessels of gasoline or any of the products of petroleum when carried by motor vehicles (commonly known as automobiles) us-

Automobiles on Ferries (Continued)

ing the same as a source of motive power:

"Provided, however, That all fire, if any, in such vehicles or automobiles be extinguished immediately after entering the said vessel, and that the same be not relighted until immediately before said vehicles shall leave the vessel:

"Provided further, that any owner, master, agent, or other persons having charge of passenger steam vessels shall have the right to refuse to transport automobile vehicles the tanks of which contain gasoline, naphtha, or other dangerous burning fluids."

While under the statute as amended steam vessels are permitted to carry automobiles that have gasoline in the tanks, they are not obliged to do so. Nevertheless, nearly all ferry boats and passenger steamers now carry motor vehicles without requiring the tanks to be emptied.

RULES AND REGULATIONS FOR NAVIGATORS.

Navigation rules promulgated and enforced by the United States Government apply equally to "power vessels"—under which name all motor driven craft are included—and vessels equipped with sails. The sailing vessel is, of course, favored, power boats being enjoined not to "obstruct the passage" of those depending entirely upon sails. Following are the general rules:

U. S. Rules for Navigation of Vessels

Alter the course to starboard and pass on port side of other vessel when meeting end on or nearly so. Follow this rule at night whenever both side lights of approaching vessel are visible across the beam.

When crossing, the vessel having the other on her starboard side, must not obstruct the other's passage.

A power vessel shall not obstruct the passage of a sailing vessel.

Do not overtake and pass another vessel in a narrow passage.

The whistle signals indicating the course required are specified.

When a signal is received, answer with the same signal.

One blast signifies "I am directing my course to starboard."

Two blasts signify "I am directing my course to port."

Three blasts signify "My engines are full speed astern."

When nearing a bend in the channel sound one long blast.

Give whistle signals by day or night only when other vessel signaled is in sight.

Rules for Navigators (Continued)

Fog signals only are given in thick or foggy weather.

A reverse or cross signal should never be sounded.

Should the signal given be inadvisable, or if same is not understood, sound not less than four short and rapid whistle blasts. If required by conditions, both vessels shall reduce speed, or stop, or reverse until proper signals are given or understood.

Bell and Whistle Signals. For the Ocean

1. When engine is stopped,
One bell means, Ahead Slow.
2. When running ahead slow,
Jingle means, Full Speed Ahead.
3. When running full speed ahead,
One bell means, Slow Down.
4. When running ahead slow,
One bell means, Stop.
5. When stopped,
Two bells mean, Astern Slow.
6. When running astern slow,
Jingle means, Full Speed Astern.
7. When running astern, slow or at full speed,
One bell means, Stop.
8. When running full speed ahead,
Four bells mean, Astern.
9. With jingle,
Full Speed Astern.

When no jingle bell is provided the following signals will suffice:

1. When stopped,
One bell means, Ahead.
2. When running ahead,
One bell means, Stop.
3. When stopped,
Two bells mean, Astern.
4. When running astern,
One bell means, Stop.
5. When running ahead,
Four bells mean, Astern.

Rules for Navigators (Continued)

For the Great Lakes, St. Lawrence River and their Tributaries

- 1 whistle or bell, Go Ahead.
- 1 whistle or bell, Stop.
- 2 whistles or bells, Back.
- 3 whistles or bells, Check.
- 4 whistles or four bells, Strong.
- 4 whistles or 4 bells, All Right.

Rules for Prevention of Collisions

Lights must be carried on a vessel in all weathers from sunset to sunrise.

White light must be placed forward visible over ten points of the compass on each side.

Red light placed on left or port side, visible from right ahead to two points abaft the beam.

Green light placed on right or starboard side, visible from right ahead to two points abaft the beam.

Combination lights, including the above, may be carried on open launches and sailing craft.

A white light shall be on board a row boat to be used in time to prevent collision.

Upon being overtaken by another vessel, a white light must be shown astern visible over twelve points of the compass aft.

Rules regarding sidelights are to be complied with when vessel is under way and not otherwise.

A white light is to be shown, while at anchor, which is visible all around the horizon.

A whistle, siren, fog-horn or something of similar nature is to be used as a fog signal. A "prolonged blast" is from four to six seconds duration.

One prolonged blast at one minute intervals or less must be given when the boat has way upon her.

In sailing vessels, one blast at one minute intervals or less must be given when on starboard tack; two blasts, at one minute intervals when on port tack; with wind abaft the beam, three blasts at similar intervals.

Ring bell or make sufficient sound.

Automobile Records on Track and Road

TRACK RECORDS

Heavyweight (1,432 to 3,304 pounds) Gasoline Cars

MILES	TIME	DRIVER	H. P.	MACHINE	MEET	DATE
1	0.53	Christie	130	Christie	St. Paul	Sept. 7, 1907
2	1.46	Oldfield	60	Peerless	Los Angeles	Dec. 21, 1904
3	2.38	Oldfield	60	Peerless	Los Angeles	Dec. 21, 1904
4	3.35	Oldfield	60	Peerless	Los Angeles	Dec. 21, 1904
5	4.41	Chevrolet	90	Fiat	Empire City	June 26, 1905
6	5.22	Oldfield	60	Peerless	Los Angeles	Dec. 21, 1904
7	6.15	Oldfield	60	Peerless	Los Angeles	Dec. 21, 1904
8	7.09	Oldfield	60	Peerless	Los Angeles	Dec. 21, 1904
9	8.04	Oldfield	60	Peerless	Los Angeles	Dec. 21, 1904
10	9.12	Oldfield	60	Peerless	New York	Oct. 29, 1904
15	14.02	Oldfield	60	Peerless	Fresno	Dec. 12, 1904
20	18.46	Oldfield	60	Peerless	Denver	Nov. 5, 1904
25	23.38	Oldfield	60	Peerless	Fresno	Dec. 12, 1904
30	28.32	Oldfield	60	Peerless	Fresno	Dec. 12, 1904
35	33.35	Oldfield	60	Peerless	Fresno	Dec. 12, 1904
40	38.31	Oldfield	60	Peerless	Fresno	Dec. 12, 1904
45	43.30	Oldfield	60	Peerless	Fresno	Dec. 12, 1904
50	48.40	Oldfield	60	Peerless	Fresno	Dec. 12, 1904
60	1:08.12	Clemens	30	National	Indianapolis	Nov. 4, 1905
70	1:19.32	Clemens	30	National	Indianapolis	Nov. 4, 1905
80	1:30.46	Clemens	30	National	Indianapolis	Nov. 4, 1905
90	1:42.14	Clemens	30	National	Indianapolis	Nov. 4, 1905
100	1:53.21	Clemens	30	National	Indianapolis	Nov. 4, 1905
150	4:05.56	Vaughan	40	Decauville	Empire City	June 24, 1905
200	5:58.52	Vaughan	40	Decauville	Empire City	June 24, 1905
250	8:20.09	Vaughan	40	Decauville	Empire City	June 24, 1905
300	10:24.42	Vaughan	40	Decauville	Empire City	June 24, 1905
350	12:49.07	Vaughan	40	Decauville	Empire City	June 24, 1905
400	15:10.29	Clemens-Mers	30	National	Indianapolis	Nov. 17, 1905
450	17:17.26	Clemens-Mers	30	National	Indianapolis	Nov. 17, 1905
500	19:44.48	Clemens-Mers	30	National	Indianapolis	Nov. 17, 1905
550	21:58.00	Clemens-Mers	30	National	Indianapolis	Nov. 17, 1905
1094 1/2	24:00.00	Clemens-Mers	30	National	Indianapolis	Nov. 17, 1905

Middleweight (881 to 1,432 pounds) Gasoline Cars

MILES	TIME	DRIVER	H. P.	MACHINE	MEET	DATE
1	0.56	E. Cedrino	24	Fiat	Empire City	Oct. 27, 1906
2	1.53	E. Cedrino	24	Fiat	Empire City	Oct. 27, 1906
3	2.49	E. Cedrino	24	Fiat	Empire City	Oct. 27, 1906
4	4.01	Tracy	30	Renault	Empire City	Sept. 24, 1904
5	5.00	Vaughan	40	Decauville	Syracuse	Sept. 18, 1905
10	9.47	Cedrino	24	Fiat	Empire City	May 30, 1907

Lightweight (551 to 881 pounds) Gasoline Cars

MILES	TIME	DRIVER	H. P.	MACHINE	MEET	DATE
1	0.55	Kulick	20	Ford	Empire City	Nov. 8, 1904
2	1.52	Kulick	20	Ford	Empire City	Nov. 8, 1904
3	2.51	Kulick	20	Ford	Empire City	Nov. 8, 1904
4	3.48	Kulick	20	Ford	Empire City	Oct. 29, 1904
5	4.43	Kulick	20	Ford	Empire City	Oct. 29, 1904

* Intermediate mile.

Steam (All Weights)

MILES	TIME	DRIVER	H. P.	MACHINE	MEET	DATE
1	0.48	Webb Jay	20	White	Morris Park	July 4, 1905
2	2.05	Ross	20	Stanley	Providence	Sept. 10, 1904
3	3.05	Ross	20	Stanley	Providence	Sept. 10, 1904
4	4.05	Ross	20	Stanley	Providence	Sept. 10, 1904
5	4.58	Webb Jay	20	White	Empire City	June 28, 1905
10	10.22	Webb Jay	20	White	Harlem Track	May 27, 1905

Automobile Records on Track and Road—(Continued)

STRAIGHTWAY RECORDS

Free-for-all Gasolene

DIST.	TIME	DRIVER	H. P.	MACHINE	MEET	DATE
1 Kil.	0.19	Chevrolet	200	Darracq	Ormond, Fla.	Jan. 25, 1906
1 Mi.	0.30	Chevrolet	200	Darracq	Ormond, Fla.	Jan. 25, 1906
2 "	0.58½	Demogeot		Darracq	Ormond, Fla.	Jan. 29, 1906
5 "	2.34	Hemery	200	Darracq	Ormond, Fla.	Jan. 24, 1906
10 "	6.15	MacDonald	90	Napier	Ormond, Fla.	Jan. 24, 1906
15 "	10.00	Lancia	110	Fiat	Ormond, Fla.	Jan. 29, 1906
30 "	20.37	Thomas	90	Mercedes	Ormond, Fla.	Jan. 31, 1906
50 "	38.51	Fletcher	80	De Dietrich	Ormond, Fla.	Jan. 31, 1906
100 "	1:15.40½	Earp	80	Napier	Ormond, Fla.	Jan. 27, 1906

Free-for-all Steam

DIST.	TIME	DRIVER	H. P.	MACHINE	MEET	DATE
1 Kil.	0.18½	Marriott		Stanley	Ormond, Fla.	Jan. 25, 1906
1 Mi.	0.38½	Marriott		Stanley	Ormond, Fla.	Jan. 25, 1906

Competitions, American

TRACK RACES

BOSTON, MASS.

Country Club of Brookline, ¼-mile track, June 15, 1901.—Summaries: Two-and-one-half miles for electric pleasure cars—A. L. Riker, 1st. Time, 9m. 17.3-5s. F. E. Queeny (Columbia), 2nd. Time, 10m. 38s. Five miles for electric racers—Adams and Alden (Columbia), 1st. Time, 9m. 7.2-5s. Riker and Whiting (Riker), 2nd. Time, 9m. 8.2-5s. Race open to steam vehicles for two passengers, stock pattern—T. E. Griffin (Locomotive), 1st. Time, 12m. 41s. Race open to steam vehicles for four passengers, stock pattern—H. McLaughlin (Locomotive), 1st. Time, 16m. 9s. Gasolene pleasure vehicles, club members only—J. T. Robinson, Jr. (Robinson), 1st. Time, 12m. 31.2-5s. Open to steam racers—T. E. Griffin (Locomotive), 1st. Time, 11m. 42.2-5s. Open to motor tricycles—K. A. Skinner, 1st. Time, 8m. 30.4-5s. Sanborn (De Dion-Bouton), 2nd. Time, 9m. 2.4-5s. Gasolene vehicles and quadricycles less than 1,000 pounds in weight—K. A. Skinner (De Dion-Bouton), 1st. Time, 9m. 34s. H. H. Brown (Autocar), 2nd. Time, 11m. 46s. Gasolene vehicles weighing between 1,000 and 2,000 pounds—Louis Française and C. J. Field (De Dion-Bouton motor-ette), 1st. Gasolene vehicles weighing over 2,000 pounds—J. T. Robinson, Jr., 1st. Time, 11m. 15s. Five miles, race between the three vehicles making best time in the preceding races—Adams and Alden (Columbia), 1st. Time, 8m. 47.4-5s. K. A. Skinner (De Dion-Bouton), 2nd. Time, 9m. 35s.

Readville track, May 30, 1904.—Summaries: Five miles, open to touring cars under 24-hp.—A. E. Morrison (24-hp. Peerless), 1st. A. C. Webb (24-hp. Pope-Toledo), 2nd. Time, 7m. 14.4-5s. Ten miles, open for all cars, irrespective of weight or hp.—Louis S. Ross (20-hp. Stanley), 1st. Time, 12m. 34s.

Readville, June 11, 1904.—Summaries: Ten miles, open to all powers, for Herald trophy—H. L. Bowden (60-hp. Mercedes), 1st. Paul Sartori (60-hp. Mercedes), 2nd. Time, 10m. 9.1-5s. Five miles, for touring cars—A. E. Morrison (24-hp. Peerless), 1st. E. R. Hollander (24-hp. Fiat), 2nd. Time, 7m. 8s. Ten miles, open—Paul Sartori (60-hp. Mercedes), 1st. Time, 10m. 8s. Five mile invitation race, Massachusetts Automobile Club invitation—William Wallace (30-hp. Renault), 1st. H. E. Rogers (24-hp. Peerless), 2nd. Time, 5m. 11.4-5s. Five miles, steamer class—Frank Durban (8-hp. Stanley), 1st. Louis S. Ross (20-hp. Stanley), 2nd. Time, 5m. 33.4-5s. Five miles, for gasolene cars between 818 and 1,433 pounds—William Wallace (30-hp. Renault), 1st. Otto Nestman (14-hp. Stevens-Duryea), 2nd. Time, 5m. 21.3-5s.

Readville, May 30, 1905.—Summaries: Five miles, steamers—W. H. Marriott (10-hp. Stanley), 1st. Frank Durbin (10-hp. Stanley), 2nd. Time, 7m. 31.4-5s. Five miles, open to two-cylinder stock cars—H. P. Maxim (18-hp. Columbia), 1st. H. M. Raymond (16-hp. Knox), 2nd. Time, 7m. 23s. Five miles, open to four-cylinder stock cars not over 30-hp.—

Track Races—Boston (Continued)

George Soules (30-hp. Pope-Toledo), 1st. J. T. Fisher (30-hp. Pope-Toledo), 2nd. Time, 5m. 59 3-5s. Five-mile match pursuit—Charles Basle (90-hp. Mercedes), 1st. Charles Gorndt (80-hp. Winton), 2nd. Time, 4m. 45s. Ten miles, Boston Herald Trophy—Charles Gorndt (80-hp. Winton), 1st. W. M. Hilliard (50-hp. Napier), 2nd. Time, 11m. 6s. Five miles, open to American four-cylinder cars of over 30 and not over 45-hp.—E. C. Bald (35-hp. Columbia), 1st. George Soules (30-hp. Pope-Toledo), 2nd. Time, 5m. 58 3-5s. Five-mile pursuit match race—W. M. Hilliard (60-hp. Napier), 1st. F. A. Nagle (50-hp. Fiat), 2nd. Time, 5m. 43s. Five miles, club championship—W. M. Hilliard (60-hp. Napier), 1st. G. G. Reed (40-hp. Stearns), 2nd. Time, 5m. 38s.

Readville, Sept. 9, 1905.—Summaries: Five miles, for stock cars, not over four-cylinder and 40-hp.—George G. Reed (Stearns), 1st. Eddie Bald (Columbia), 2nd. Time, 6m. 12-5s. Five miles, for stock cars, not over two-cylinder and 24-hp.—Eddie Bald (Columbia), 1st. Leon G. Morrill (Winton), 2nd. Time, 7m. 10 3-5s. Ten-mile match race—Emanuel Cedrino (Fiat), 1st. W. H. Hilliard (Napier), 2nd. Time, 8m. 29 4-5s. Ten-mile open, for stock cars of 24 or less hp.—E. H. Rogers (Peerless), 1st. C. B. Grout (Grout), 2nd. Time, 14m. 54-5s. Ten miles, Boston Herald Trophy, free-for-all—Charles Basle (Mercedes), 1st. E. Cedrino (Fiat), 2nd. Time, 9m. 34s. Ten miles, for American stock cars, as listed in full touring condition—Bert Holland (Stanley), 1st. George G. Reed (Stearns), 2nd. Time, 12m. 11s. Five-mile championship—Barney Oldfield (Peerless), 1st. Emanuel Cedrino (Fiat), 2nd. Time, 4m. 52s. Five-mile trial against record—J. W. Ward (Buick). Time, 6m. 19 2-5s., world's record for two-cylinder cars.

BUFFALO, N. Y.

Fort Erie one-mile track, Sept. 26, 27 and 28, 1901.—Summaries:

Sept. 26.—Twenty-five miles, time trial—Henry Fournier (60-hp. Mors). Time, 38m. Fastest mile, 1m. 14s.

Sept. 27.—Five miles for 1½-hp. motor bicycles—E. J. Edwards (Auto-bicycle), 1st. Time, 11m. 18s. G. W. Sherman (Auto-bicycle), 2nd. Ten-mile handicap for gasoline vehicles—Alexander Winton (40-hp. Winton), 1st. Time, 13m. 39s. W. N. Murray (40-hp. Winton), 2nd. Five-mile race for steam stock vehicles—J. T. Jones (Locomobile), 1st. G. W. Burrell (Mobile), 2nd. Fifteen-

Track Races—Buffalo (Continued)

mile handicap for gasoline vehicles—C. M. Hamilton (8½-hp. Winton), 1st. Time, 29m. 44s. E. Apperson (8½-hp. Haynes-Apperson), 2nd. Mile qualifying heat for steam stock vehicles—C. H. Williams (Locomobile), 1st. H. F. Spaulding (Locomobile), 2nd. Two-mile race for steam stock vehicles—J. A. Jones, 1st. Time, 4m. 17½s. G. W. Burrell, 2nd. Three-mile, 1½-hp. auto-bicycle race—G. W. Sherman, 1st. Time, 6m. 33s. E. L. Ferguson, 2nd. Three-mile handicap, open to all classes—G. A. Boyer, 1st, scratch. Time, 6m. 1½s. M. West, ½-mile, 2nd. Three-mile match race—Ray Duer (single Auto-bicycle), 1st. Time, 5m. 35s. Vetter and Fisher (tandem Auto-bicycle), 2nd.

Kenilworth Park track, Aug. 18 and 19, 1905.—Summaries:

Aug. 18.—Two-mile motorcycle race—Leonard M. Gard (Indian), 1st. William Chadeayne (Thomas), 2nd. Time, 3m. 16s. Five-mile open for cars under 1,432 pounds—Herbert Lyttle (Pope-Toledo), 1st. Fred. Tone (Marion), 2nd. Time, 5m. 34s. Five-mile open, Buffalo Derby—M. Roberts (Thomas), 1st. Herbert Lyttle (Pope-Toledo), 2nd. Time, 5m. 27s. Five-mile open for stripped touring cars—Herbert Lyttle (Pope-Toledo), 1st. George Salzman (Thomas), 2nd. Time, 5m. 19s. Five-mile exhibition—Barney Oldfield. Time, 4m. 41 3-5s. Ten-mile open, unfinished owing to accident to Webb Jay.

Aug. 19.—Five-mile exhibition—Herbert Lyttle (Pope-Toledo). Time, 5m. 31 2-5s. Three-mile novelty race, for fully equipped touring cars—Charles Soules (Pope-Toledo), 1st. W. F. Hart (Pope-Toledo), 2nd. Time, 4m. 47s. Five-mile national championship—Barney Oldfield (Peerless), 1st. M. Roberts (Thomas), 2nd. Time, 4m. 52 3-5s. Five-mile, for stock touring cars, with driver and three passengers—George Salzman (Thomas), 1st. Charles Soules (Pope-Toledo), 2nd. Time, 6m. 6 2-5s. Ten-mile, Buffalo Derby—Charles Burman (Peerless), 1st. M. Roberts (Thomas), 2nd. Time, 10m. 38s. Five-mile free-for-all—Diamond Cup race—Herbert Lyttle (Pope-Toledo), 1st. Time, 4m. 52s.

CHICAGO, ILL.

Harlem track, May 27, 29 and 30, 1905.—Summaries:

May 27.—Three-mile novelty race for fully equipped touring cars—Charles Soules (Toledo), 1st. J. A. Ellis (Apperson), 2nd. Time, 5m. 21-5s. Five-mile race for cars weighing 881 to 1,432 pounds—W. F. Winchester (Franklin),

Track Races—Chicago (Continued)

1st. R. W. Harroun (Harroun), 2nd. Time, 6m. 16 4/5s. Inter-club team race, New York vs. Chicago—W. B. Christie (Christie), A. C. A., 1st. Carl Fisher (Pope-Toledo), Chicago A. C., 2nd. Time, 5m. 10s. Ten-mile open—Webb Jay (White), 1st. Barney Oldfield (Green Dragon), 2nd. Time, 10m. 22 1/5s. First heat of ten miles, for \$1,000 cash, winner of final to receive \$1,000 in gold—Webb Jay (White), 1st. Carl Fisher (Pope-Toledo), 2nd. Time, 10m. 20s. Five miles, Chicago dealers' handicap—J. H. McDuffee (Stoddard-Dayton), 1st. Orlando F. Weber (Pope-Toledo), 2nd. Time, 6m. 19 2/5s.

May 29.—Five-mile race for cars listed at \$3,000 or under—C. A. Coey (Thomas), 1st. J. H. McDuffee (Stoddard-Dayton), 2nd. Time, 6m. 45s. Two-mile novelty race for fully equipped touring cars—G. H. Baird (Premier), 1st. Time, 5m. 20 2/5s. Ten miles, Chicago owners' handicap—Jerry Ellis (Apperson), 1st. H. M. Daley (Pope-Toledo), 2nd. Time, 13m. 21 2/5s. Five-mile special, challenge between C. A. Coey and J. H. McDuffee—C. A. Coey, 1st. Time, 6m. 22s.

May 30.—Second heat of five miles inter-city team race for H. E. Thomas' cup, continued from Saturday, May 27—Louis Chevrolet (90-hp. car), 1st. Webb Jay (15-hp. White), 2nd. Time, 4m. 54 4/5s. Ten-mile open race, final heat—Webb Jay (15-hp. White), 1st. Barney Oldfield (60-hp.), 2nd. Time, 9m. 49 2/5s. Five-mile match race, special—C. A. Coey (40-hp.), 1st. Elmer Apperson (40-hp.), 2nd. Time, 6m. 16 2/5s. Five-mile race for cars listed at \$2,000 or under—J. H. McDuffee (24-hp. car), 1st. J. W. Hayden (16-hp. car), 2nd. Time, 6m. 46 2/5s. Ten-mile open, postponed from Monday, May 29—Webb Jay (15-hp. White), 1st. Jesse Ellingworth (24-hp. Gray Wolf), 2nd. Time, 10m. 45s. Ten miles, grand handicap—Jesse Ellingworth (24-hp. Gray Wolf), 1st. Earl Kiser (60-hp.), 2nd. Time, 10m. 29s. Five-mile special race—Webb Jay (15-hp. White), 1st. Louis Chevrolet (90-hp. car), 2nd. Time, 4m. 58s.

CINCINNATI, O.

Oakley Park, Nov. 25, 1901.—Summaries: Five miles, steam cars—Emmet P. Gray, 1st. Howard Miller, 2nd. Time, 12m. 4s. Five miles, gasoline cars, 12-hp. and below—R. Meyer, 1st. Max C. Fleischmann, 2nd. Time, 8m. 32 3/4s. Gasoline cars, 12 to 20-hp.—R. Meyer, 1st. Carl G. Fisher, 2nd. Time, 9m. 24s. Henry Fournier, time trial—1st mile, 1m. 11 1/5s., 2nd, 1m. 9s., 3rd, 1m. 9s., 4th, 1m. 8 4/5s., 5th, 1m. 8 1/5s., 6th, 1m.

Track Races—Cincinnati (Continued)

9 1/5s., 7th, 1m. 10s., 8th, 1m. 11s., time for 8 miles, 9m. 16 2/5s.

Oakley Fair, Aug. 18, 1905.—Summaries: One mile—J. H. Stricker (Olds), 1st. V. Emerson (Autocar), 2nd. Time, 1m. 46s. Two miles—J. H. Stricker (Olds), 1st. V. Emerson (Autocar), 2nd. Time, 3m. 31s. Five-mile handicap for dealers, Odell Cup—Gunther Bros. (Royal), 1st. Schacht Manufacturing Company (Schacht), 2nd. Time, 8m. 4s.

CLEVELAND, O.

Glenville Driving Park, Sept. 16, 1902.—Summaries: Five miles, steam, all weights—Rollin H. White (White), 1st. John McDonald (Geneva), 2nd. Time, 9m. 53 1/2s. Five miles, gasoline, 1,000 pounds and under—H. S. Moore (Elmore), 1st. J. D. Dickson (Cleveland), 2nd. Time, 11m. 10 3/4s. Five miles, gasoline, 2,000 pounds and under—H. S. Harkness (Mercedes), 1st. C. B. Shanks (Winton), 2nd. Time, 6m. 32 3/4s. Former track record, 6m. 42s., by F. A. Roche (Darracq), Brighton Beach, August 23. Harkness afterward disqualified for overweight; race awarded to Shanks. Three miles, electric, all weights—Walter Baker (Baker), 1st. W. M. Wright (Waverley), 2nd. Time, 5m. 54 3/4s. Ten-mile handicap for winners and seconds in preceding races 1, 2, 3, and 4—Rollin H. White (White), 1st. Percy Owen (Winton), 2nd. Time, 14m. 59 1/2s. Ten miles, open—Alexander Winton (Winton), 1st. H. S. Harkness (Mercedes), 2nd. Time, 10m. 50s. Former record 11m. 9s., by Alexander Winton, Detroit, October 24, 1901. Australian pursuit—Alex. Winton (Winton Bullet), 1st. H. S. Harkness (Mercedes), 2nd. No time given. In the 2nd mile Winton covered the mile in 1m. 2 1/4s. Former record, 1m. 6 2/5s., by Alex. Winton, Detroit, October 24, 1901. Ten-mile handicap—Percy Owen (Winton), 1st. Paul Deming (White), 2nd. Time, 13m. 34s. Two-hundred-yard obstacle race—R. H. Gilbert (Locomobile), 1st. Walter Baker (Baker), 2nd. Time, 49s. Five-mile special race, to beat 6m. 44s.—Rollin H. White (White), 1st. Time, 6m. 43s.

Glenville Driving Park, Sept. 4 and 5, 1903.—Summaries:

Sept. 4.—Two miles, for gasoline cars of 1,000 pounds and under—D. Wurgis (Oldsmobile), 1st. Time, 2m. 27 2/5s. W. C. Baker (Torpedo Kid), 2nd. Time, 2m. 56 3/5s. Five-mile handicap, for club members only—F. B. Stearns (Stearns), 1st. Time, 8m. 28 3/5s. Otto Konigslow (Ottokar), 2nd. Time, 9m. 15s. Five miles for 1,800 pound cars and under, all

Track Races—Cleveland (Continued)

powers — Barney Oldfield (Winton Baby), 1st. Time, 5m. 26s. D. Wurgis (Oldsmobile), 2nd. Time, 5m. 44s. Ten miles, open to all—Barney Oldfield (Winton), 1st. Time, 10m. 35 4-5s. D. Wurgis (Oldsmobile), 2nd. Time, 11m. 7 3-5s. Five-mile open, manufacturers' challenge cup—Barney Oldfield (Winton), 1st. Time, 5m. 25 3-5s. J. L. Hedges (White), 2nd. Time, 6m. 38 4-5s. Ten-mile handicap, open—W. C. Schroeder (Stearns), 1m. 30s., 1st. Time, 12m. 38 2-5s. H. Page (Decauville), 30s., 2nd. One mile electric—W. M. Wright (Waverley), 1st. Time, 1m. 26 4-5s. D. Chisholm (Baker Kid), 2nd. Special ten-mile race, to beat 10m. 25 2-5s. for cars weighing under 1,800 pounds—Barney Oldfield (Winton), 1st. Time, 10m. 6s. Special five-mile exhibition to beat record of 8m. 40s. for electric machines—D. Chisholm (Baker), 1st. Time, 6m. 29 3-5s.

Sept. 5.—One-mile heats, best two in three, flying start—Barney Oldfield (Winton), 1st. Time, 1m. 12 1-5s., 1m. 6s. Two miles for cars of 800 pounds and less—W. C. Baker (Torpedo Kid), 1st. W. Wigle (Oldsmobile), 2nd. Time, 2m. 57 4-5s. Five-mile open—Barney Oldfield (Winton Baby), 1st. Jules Sincholle (Darracq), 2nd. Time, 5m. 23s. Ten-mile handicap for cars 1,800 pounds and less—Jules Sincholle (Darracq), 1m., 1st. Henri Page (Decauville), 1m., 2nd. Time, 11m. 52 2-5s. Five mile electric—W. C. Baker (Baker), 1st, time, not announced. No others finished. Ten-mile open handicap—W. C. Schroeder (Stearns), 3m., 1st. J. L. Hedges (White Turtle), 1½m., 2nd. Time, 12m. 21 4-5s. Ten-mile Australian pursuit race—Barney Oldfield (Winton Baby), caught W. C. Schroeder (Stearns), at 1¾ miles, and catching Henri Page (Decauville) at 67-16 miles, won, time, 6m. 55 3-5s. Time trials: To break the ten-mile steam record of 14m. 6s.—J. L. Hedges (White Turtle), 1st. Time, 12m. 20 4-5s. Time trials—Barney Oldfield (Winton Baby), time, 1m. 14-5s., 2m. 3 2-5s., 3m. 4 4-5s., 4m. 6 2-5s., 5m. 8s., 6m. 8 2-5s., 7m. 8 3-5s., 8m. 9 2-5s.

Glenville Driving Park, Oct. 15, 1904.—Summaries: Five miles, 24-hp. cars, road equipment—Webb Jay (24-hp. Peerless), 1st. George T. Turner (Peerless), 2nd. Time, 6m. 36 1-5s. Match race, ten miles—Barney Oldfield (Peerless Green Dragon), 1st. Time, 9m. 17 1-5s. Earl Kiser (Winton Bullet No. 2), 2nd. Time, 10m. 11 1-5s. Five-mile, open, stock cars, stripped, 35-hp. and under—Burman (Peerless), 1st. Joe Tracy (Royal), 2nd. Time, 5m. 37 3-5s. Five-

Track Races—Cleveland (Continued)

mile open, handicap—Webb Jay (White), 20s., 1st. George E. Turner (Peerless), 20s., 2nd.

Glenville Driving Park, Aug. 12 and 14, 1905.—Summaries:

Aug. 12.—Five-mile open, for cars weighing 1,432 pounds or under—H. H. Lyttle (Pope-Toledo), 1st. Dan Wurgis (Reo), 2nd. Time, 5m. 18 2-5s. Five miles, for stock touring cars, listed at \$2,000 or less—Marr (Buick), 1st. R. E. Hawkins (Gaeth), 2nd. Time, 7m. 25 3-5s. Five miles, free-for-all, for the Diamond Cup trophy—Webb Jay (White), 1st. Charles Burman (Peerless), 2nd. Time, 5m. 16s. Five miles, for stripped touring cars—H. H. Lyttle (Pope-Toledo), 1st. Robert Jardine (Royal), 2nd. Time, 4m. 54 4-5s. Five miles, for club championship, members only—C. C. Ferguson (Pope-Toledo), 1st. M. B. Grover (Royal), 2nd. Time, 6m. 27 3-5s. Cleveland Derby, for \$500 trophy—Charles Burman (Peerless), 1st. Time, 5m. 13s. Five miles, special exhibition for cars weighing 1,432 pounds or less—H. H. Lyttle (Pope-Toledo). Time, 4m. 57 3-5s.

Aug. 14.—Five miles, for touring cars with tonneau—Robert Jardine (Royal), 1st. Geo. Salzman (Thomas), 2nd. Time, 6m. 51-5s. Five-mile handicap for touring cars with tonneau called off. Five miles, against the Glenville track record—Barney Oldfield (Peerless). Time, 4m. 45 3-5s. Final heat in Cleveland Derby—Webb Jay (White), 1st. Charles Burman (Peerless), 2nd. Time, 5m. 43 4-5s. Five-mile free-for-all, national championship—Charles Burman (Peerless), 1st. H. H. Lyttle (Pope-Toledo), 2nd. Time, 5m. 15 4-5s.

DAYTON, O.

Fair grounds, July 4, 1904.—Summaries: J. D. Platt, Jr. (Franklin), 1st. C. C. Rooney (Marr), 2nd. Time, 5m. 3s. Match race, special, in place of regularly scheduled event—J. J. Winchester (Franklin), 1st. Earl Kiser (Old Pirate), 2nd. Five miles, open—J. J. Winchester (Franklin), 1st. Earl Kiser (Pope-Toledo), 2nd. Time, 7m. 27 1-5s. Match race, special, instead of ladies' race, cancelled—Carl Fisher (Comet), 1st. J. J. Winchester (Franklin), 2nd. Three miles for stock cars, stripped—A. M. Dobbs (Franklin), 1st. H. M. Carr (Franklin), 2nd. Time, 5m. 16 2-5s. Three miles, heavy touring cars, loaded—Carl Fisher (Pope-Toledo), 1st. Pierce Schenck (Winton), 2nd. Time, 5m. 43 2-5s. Three miles, for light touring cars, loaded, stop and start—H. M. Carr

Track Races—Dayton (Continued)

(Franklin), 1st. Dobbs (Franklin), 2nd. Time, 7m. 15s. Two miles, special, against time—Carl Fisher (Premier-Comet), 1st. Time, 2m. 40s. Three miles, for touring cars, special—Emil Koeb (Springfield), 1st. C. B. Wolf (Dayton), 2nd. Three miles, for heavy touring cars, loaded, stop and start—Carl Fisher (Pope-Toledo), 1st. C. B. Wolf (Haynes-Apperson), 2nd. Time, 8m. 12 3-5s. Three miles, for light touring cars—H. M. Carr (Franklin), 1st. A. M. Dodds (Franklin), 2nd. Time, 5m. 46s. Five-and-one-half mile pursuit race—Carl Fisher, 1st. J. D. Platt, 2nd. Time, 7m. 32s.

DETROIT, MICH.

Grosse Point one mile track, Oct. 10, 1901.—Summaries: Five-mile race for steam cars—W. T. White (White), 1st. H. H. Lyttle, 2nd. Time, 10m. 13-5s. One-mile open for machines weighing less than 1,500 pounds—William Rand, 1st. H. H. Lyttle, 2nd. Time, 1m. 51 4-5s. Ten-mile open for machines weighing less than 1,000 pounds—W. T. White, 1st. J. P. Chapin, 2nd. Time, 10m. 54-5s. Ten-mile open, for machines weighing less than 2,000 pounds—Edgar Apperson, 1st. W. T. White, 2nd. Time, 17m. 47 1-5s. Obstacle race—W. C. Baker, 1st.

Grosse Point track, Oct. 24 and 25, 1902.—Summaries:

Oct. 24.—Five miles, steam road machines—Windsor T. White (White), 1st. John McDonald (Geneva), 2nd. Time, 10m. 42s. Five miles, 1,000 pounds and under—Locomobile Company (Locomobile), 1st. J. D. Maxwell (Northern), 2nd. Time, 7m. 51 4-5s. Two miles, electric—W. C. Baker (Baker), 1st. Jackson Brady (Waverley), 2nd. Time, 4m. 14s. Five miles, 2,000 pounds, gasoline—H. S. Harkness (Mercedes), 1st. Charles B. Shanks (Winton), 2nd. Time, 6m. 12-5s. Ten-mile handicap—J. L. McNamara (Olds), 6m. 30s., 1st. H. S. Harkness (Mercedes), 1m. 30s. 2nd. Time, 18m. 15 1-5s. Two hundred-yard obstacle race—W. C. Baker (Baker), 1st.

Oct. 25.—Five miles, for gasoline cars of 5-hp. or under—W. Wigle (Oldsmobile), 1st. D. B. Huss (Oldsmobile), 2nd. Time, 7m. 50s. Five-mile handicap, Detroit owners—W. Rockerman (Elmore), 4m. 15s., 1st. W. C. Rands (Ford), scratch, 2nd. Time, 7m. 6 1-5s. Three miles, steam, open—W. C. Buckman (Geneva), 1st. Windsor T. White (White), 2nd. Time, 4m. 7 2-5s. Ten-mile handicap, open—Charles B. Shanks (Winton), 2m. 1st. Time, 13m. 34-2-5s.

Track Races—Detroit (Continued)

H. S. Harkness (Mercedes), 45s., 2nd. Time, 12m. 49 2-5s. Five miles, manufacturers' challenge cup—Barney Oldfield (Ford), 1st. Charles B. Shanks (Winton), 2nd. Time, 5m. 28s. Twenty miles, open—H. S. Harkness (Mercedes-Simplex), 1st. Alexander Winton, quit in the ninth mile. Time trial, electric runabouts—W. C. Baker (Baker), time for 10 miles, 17m. 57s., time for first five miles, 9m. 5 1-5s.

Grosse Point track, Sept. 7 and 8, 1903.

—Summaries:

Sept. 7.—Five miles for gasoline cars under 1,000 pounds—D. Wurgis (Oldsmobile), 1st. F. Prong (Oldsmobile), 2nd. Time, 8m. 23 3-5s. Five miles, for cars under 2,000 pounds—Jules Sincholle (Darracq), 1st. Barney Oldfield (Winton), 2nd. Time, 6m. 52-5s., fastest mile, 1m. 84-5s. Five miles, for manufacturers' challenge cup, to be won three times to retain ownership—Tom Cooper (Ford), 1st. Harry Cunningham (Special), 2nd. Time, 5m. 32 3-5s., fastest mile, 1m. 4s. Ten miles, open—Barney Oldfield (Winton), 1st. Henri Page (Decauville), 2nd. Time, 12m. 19s. Five miles, match race (first heat)—Barney Oldfield (Winton), 1st. Tom Cooper (Ford), 2nd. Time, 5m. 46s. fastest mile, 1m. 84-5s. Fifteen miles, special race—Jules Sincholle (Darracq), 1st. Henri Page (Decauville), 2nd. Time, 16m. 3s.

Sept. 8th.—Three miles, for gasoline cars, 800 pounds and under—F. Prong (Oldsmobile), 1st. Time, 4m. 45s. Ten miles, triangular race—Jules Sincholle (Darracq), 1st. Henri Page (Decauville), 2nd. Time, 10m. 44s. Five miles, open—Jules Sincholle (Darracq), 1st. Henri Page (Decauville), 2nd. Time, 5m. 24s. Ten-mile handicap—Harry Cunningham (Special), 30s., 1st. D. Wurgis (Oldsmobile), 1m., 2nd. Time, 10m. 58 3-5s. Five-mile special match race—Barney Oldfield (Winton), 1st. Tom Cooper (Ford), 2nd. Time, 5m. 15 2-5s. Ten miles, open—Harry Cunningham (Special), 1st. Time, 10m. 53 4-5s.

Grosse Point track, Aug. 26 and 27, 1904.—Summaries:

Aug. 26.—Five-mile open, cars under 1,432 pounds—Frank Kulik (Ford), 1st. W. F. Winchester (Franklin), 2nd. Time, 5m. 40 4-5s. Ten miles open, stock touring cars, stripped—George Soules (Pope-Toledo), 1st. William Newman (Pope-Toledo), 2nd. Time, 11m. 58 4-5s. Five miles, open, manufacturers' challenge cup—Barney Oldfield (Peerless), 1st. Charles Gorndt (Winton), 2nd. Time, 5m. Five-mile handicap—Barney Oldfield

Track Races—Detroit (Continued)

(Peerless), scratch, 1st. Frank Kulick (Ford), $\frac{3}{4}$ -mile, 2nd. Time, 5m. 13 1-5s. Five-mile motorcycle—J. G. Willett (Auto-Bi), 1st. E. E. Denniston (Auto-Bi), 2nd. Time, 7m. 53-5s. Fifteen-mile open—Earl Kiser (Winton), 1st. Barney Oldfield (Peerless), 2nd. Time, 14m. 51 1-5s.

Aug. 27.—Five-mile open, cars under 1,432 pounds—W. F. Winchester (Franklin), 1st. Al Brush (Cadillac), 2nd. Time, 7m. 12 4-5s. Five miles, open, Detroit owners' handicap—Harry Savage (Peerless), 1st. J. J. Miller (Elmore), 2nd. Time, 7m. 41s. Ten-mile open—Barney Oldfield (Peerless), 1st. Earl Kiser (Winton), 2nd. Time, 10m. 42-5s. Five miles, motorcycle handicap—L. I. Lutes (Mitchell), 1m. 45s., 1st. Maurice Canutson (Orient), 45s., 2nd. Time, 7m. 31 2-5s. Five-mile handicap—W. F. Winchester (Franklin), $\frac{3}{4}$ -mile, 1st. H. H. Lyttle (Pope-Toledo), scratch, 2nd. Time, 4m. 58 2-5s. Ten miles, open—H. H. Lyttle (Pope-Toledo), 1st. Charles Gorndt (Winton), 2nd. Time, 10m. 42s.

Grosse Point track, Aug. 7 and 8, 1905.—Summaries:

August 7.—Five-mile open, for cars under 1,432 pounds—Dan Wurgis (Reo), 1st. George Soules (Pope-Toledo), 2nd. Time, 5m. 40 1-5s. Five-mile open, for stock touring cars, listed at \$1,500—E. F. Schoeffler (Jackson), 1st. G. Breed (Buick), 2nd. Time, 7m. 31s. Five-mile motorcycle handicap—Hamilton Cahart, Jr., scratch, 1st. Oscar Kratz, 30s., 2nd. Time, 7m. 33 2-5s. Five-mile race—Webb Jay (White), 1st. Dan Wurgis (Reo), 2nd. Time, 5m. 15 4-5s. Five-mile open, for stock touring stripped cars—Charles Burman (Peerless), 1st. Charles Soules (Pope-Toledo), 2nd. Time, 5m. 15 2-5s. Ten-mile open—Webb Jay (White), 1st. Time, 9m. 36 3-5s. Barney Oldfield (Peerless), 2nd. Time, 9m. 49s.

August 8.—Five-mile open, for cars under 1,432 pounds—Dan. Wurgis (Reo), 1st. George Soules (Pope-Toledo), 2nd. Time, 5m. 28 4-5s. Five miles, Diamond Cup race—Webb Jay (White), 1st. Barney Oldfield (Peerless), 2nd. Time, 4m. 52 4-5s. Five-mile open, for stock touring cars listed at \$1,500 or under—G. Breed (Buick), 1st. Meyers, 2nd. Time, 8m. 11 2-5s. Five-mile open, in which Barney Oldfield, Webb Jay, Dan Wurgis, and Charles Burman entered, was unfinished owing to accident. Five-mile open, for stripped stock touring cars—Charles Soules (Pope-Toledo), 1st. Fred Tone (Marion), 2nd. Time, 5m. 49 2-5s.

HARTFORD, CONN.

Charter Oak Park, June 16 and 17, 1905.—Summaries:

June 16.—One mile, Corinthian, amateur owners driving—W. C. Russell (10-hp. Stanley), 1st. Time, 1m. 41s. E. Hill, Jr. (35-40-hp. Columbia), 2nd. Time, 1m. 43 3-5s. Three-mile club handicap, trial heats run without handicaps—George Soules (30-hp. Pope-Toledo), 7s., 1st. Time, 3m. 35 1-5s. E. C. Bald (35-40-hp. Columbia), scratch, 2nd. Time, 4m. 52-5s. One mile, free-for-all—Chevrolet (90-hp. Fiat), 1st. Oldfield (50-hp. Peerless), 2nd. Time, 1m. 3s. Five miles, motorcycle, open—Jacob Derossier (1 $\frac{3}{4}$ -hp. Indian), 1st. Alexander Smith (1 $\frac{3}{4}$ -hp. Indian), 2nd. Time, 6m. 46s. Three miles, for touring cars, stock cars only, each car to carry three persons besides the driver, start to be made at the tape with engines dead, passengers discharged at end of first mile and taken on again at end of second mile—Charles Soules (30-hp. Pope-Toledo), 1st. Time, 4m. 55s. Five miles, for Class B cars, 881 to 1,432 pounds—H. Raymond (16-hp. Knox), 1st. Frank Durbin (10-hp. Stanley), 2nd. Time, 6m. 59 2-5s. Five-mile exhibition against time—Barney Oldfield (Peerless Green Dragon). Time, 5m. 33-5s. Record time, 4m. 29s. Five miles, for stock cars listed at more than \$3,000—Charles Soules (30-hp. Pope-Toledo), 1st. E. C. Bald (35-40-hp. Columbia), 2nd. Time, 6m. 14s.

June 17.—One mile, for runabouts, stock cars listed at \$1,000 or under—L. H. Elmer (16-hp. Rambler), 1st. R. M. Alexander (10-hp. Pope-Hartford), 2nd. Time, 1m. 48s. Five-mile pursuit race, between Barney Oldfield (60-hp. Peerless) and Louis Chevrolet (90-hp. Fiat)—Chevrolet's machine broke down at the start, and he was out of it. Referee declared no race and the case referred to the A. A. A. Racing Board. One mile, stock cars listed from \$1,000 to \$2,000—H. Raymond (16-hp. Knox), 1st. A. E. Dennison (16-hp. Knox), 2nd. Time, 1m. 24 3-5s. Five miles, cars weighing 1,432 to 2,204 pounds—Barney Oldfield (60-hp. Peerless), 1st. A. M. Roberts (60-hp. Thomas), 2nd. Time, 5m. 26 1-5s. One mile, stock cars listed from \$2,000 to \$3,000—Peter Thompson (40-hp. Thomas), 1st. C. S. Henshaw (40-hp. Thomas), 2nd. Time, 1m. 44 1-5s. Five miles, free-for-all, cars having record of better than one mile in 60s. barred—E. C. Bald (35-40-hp. Columbia), 1st. Five miles, Charter Oak handicap, open to all classes—H. Raymond (16-hp. Knox), 35s., 1st. C. S. Henshaw (40-hp. Thomas), scratch, 2nd. Time, 7m. 35s. Five miles, A. A. A. na-

Track Races—Hartford (Continued)

tional championship, trophy awarded at end of season to car having highest score—Barney Oldfield (60-hp. Peerless), 1st., scoring four points. Time, 5m. 12-5s.

JOLIET, ILL.

Oct. 18, 1901—Summaries: Ten miles, gasoline, weight unlimited—E. B. Shaw, 1st. Robert Shaw, 2nd. Time, 27m. 22s. Half mile, steam—W. J. Eldredge, 1st. Charles H. Tucker, 2nd. Time, 1m. Five miles, steam—C. H. Tucker, 1st. Dr. Frank Davis, 2nd. Time, 11m. 29s. Ten miles, gasoline, handicap—J. R. Burdett, 5m., 1st. Robert Shaw, 3m., 2nd. Time, 22m. 35s. One mile handicap match race between James Rankin, Jr. and J. F. Gunther—James Rankin, Jr. (motor bicycle), 1st. Time, 1m. 35s. J. F. Gunther (Autoette motor tricycle), $\frac{1}{4}$ -mile start, 2nd. Forty miles, road race, Chicago to Joliet—E. B. Shaw, 1st. Time, 1h. 33m. 32s. J. B. Burdett, 2nd. Time, 1h. 49m. 48s.

KANSAS CITY, MO.

Elm Ridge track, Oct. 3, 1906.—Summaries: Fifty miles, stock cars—J. H. Wittman (Pope-Toledo), 1st. J. C. Whittle (Buick), 2nd. Time, 1hr. 7m. 41s. Five miles, runabouts up to \$1,000—J. C. Whittle (Buick), 1st. Ford (Buick), 2nd. Time, 7m. 37s. Five miles, touring cars up to \$1,800, catalog equipment—J. C. Whittle (Buick), 1st. Buick (Buick), 2nd. Time, 7m. 32s. Five miles, touring cars, \$1,800 to \$2,800 catalog—Theo. Peltzer (Stevens-Duryea), 1st. F. E. Grant (White), 2nd. Time, 7m. 31s. Five-mile match race between Pope-Toledo and Thomas—J. Walker (Thomas), 1st. H. Gilmore (Pope-Toledo), 2nd. Time, 7m. 16s. Five miles, free-for-all—F. E. Grant (Thomas), 1st. Time, 6m. 57s. Five miles, stock cars—Phil Otto (Pope-Toledo), 1st. J. H. Wittman (Pope-Toledo), 2nd. Time, 5m. 49 $\frac{1}{2}$ s. Five-mile match race—A. C. Webb (Premier), 1st. J. H. Wittman (Pope-Toledo), 2nd. Fastest mile, 1m. 4s.

LONG BRANCH, N. J.

Elkwood Track, Aug. 19 and 22, 1905.—Summaries:

August 19.—One mile, for two-cylinder cars, best two in three heats—Q. W. Ward (Buick), 1st. F. W. Leland (Stevens-Duryea), 2nd. Time, 1m. 57 2-5s. Three miles, free-for-all—Q. W. Ward (Buick), 1st. J. Heller (Pope), 2nd. Time, 4m. 41 1-5s. Four-mile handicap—O. J. Smith (Maxwell), 1m. 45s., 1st. G. B. Demarest (Locomobile), 1m., 2nd.

Track Races—Long Branch (Continued)

Time, 5m. 32s. Five-mile pick-me-up—A. L. Kull (Wayne), 1st. Leon Cobberly (Autocar), 2nd. Time, 12m. 39 2-5s. Five-mile motorcycle race—J. F. Bruyere (Curtis), 1st. R. A. Bonner (Indian), 2nd. Time, 6m. 32s.

August 22.—Fifty miles against time—Emanuel Cedrino, Jr. (Fiat), 1st. Time, 53m. 14 2-5s. Time by miles: (first), 1m. 1s.; (fifth), 5m. 6s.; (tenth), 10m. 13s.; (fifteenth), 15m. 20s.; (twentieth), 20m. 27 3-5s.; (twenty-fifth), 25m. 35 3-5s.; (thirtieth), 30m. 52 2-5s.; (thirty-fifth), 36m. 40s.; (fortieth), 42m. 6 2-5s.; (forty-fifth), 47m. 35 3-5s.; (fiftieth), 53m. 14 2-5s. Two miles, best two in three heats, for cars costing between \$1,000 and \$1,700—First heat. William Longstreet (Maxwell), 1st. J. Hood (Rambler), 2nd. Time, 3m. 25 1-5s. Second heat—William Longstreet (Maxwell), 1st. C. W. Kelsey (Maxwell), 2nd. Time, 3m. 27 2-5s. Second prize won by the Rambler car. One mile free-for-all, best two in three heats—First heat. Emanuel Cedrino (Fiat), 1st. Guy Vaughn (Decauville), 2nd. Time, 1m. 6 2-5s. Second heat—Emanuel Cedrino (Fiat), 1st. Guy Vaughn (Decauville), 2nd. Time, 1m. 5 2-5s. One mile, best two in three heats, cars costing from \$650 to \$1,000—Charles Fleming (Maxwell), 1st. Roger Stern (Ford), 2nd. Time, 1m. 41 3-5s. Second heat—Charles Fleming (Maxwell), 1st. E. Hitchcock (Acme), 2nd. Time, 1m. 39 1-5s. Second prize won by the Ford car. Five-mile handicap, for motorcycles—F. H. Van Dorn (Indian), 1st. Satake (Clement), 2nd. Time, 2m. 30s.

MILWAUKEE, WIS.

June 2 and 3, 1905.—Summaries:

June 2.—Three miles, open to Cadillac cars—August Jonas, 1st. William Jonas, 2nd. Time, 7m. 13 2-5s. Three miles, for motor cycles—Walter Davidson (Davidson), 1st. H. A. Zerbel (Merkel), 2nd. Time, 4m. 24 2-5s. Five miles, open to one-minute class cars—Charles Soules (Pope-Toledo), 1st. Dan Canary (Thomas Tornado), 2nd. Time, 5m. 38 2-5s. Three miles, open to Ramblers, fully equipped—Arthur Gardner, 1st. Harry Wade, 2nd. Time, 5m. 43s. Three miles, open to cars listing at \$2,000 and under—Joseph McDuffee (Stoddard-Dayton), 1st. H. A. Zerbel (Merkel), 2nd. Time, 4m. 57 2-5s. Five-mile novelty, to carry three passengers, and stop and unload at each mile—Orlander F. Weber (Pope-Toledo), 1st. Henry Nelson (Pope-Toledo), 2nd. Time, 8m. 45s. Five-mile handicap—Zerbel (Merkel), 2m. 30s. 1st time, 8m. 47s. Coey (Thomas), 2nd. Time, 6m. 17 1-5s. Five miles, Cream City Sweepstakes—Barney Oldfield

Track Races—Milwaukee (Continued)

(Peerless Green Dragon), 1st. Charles Soules (Pope-Toledo), 2nd. Time, 4m. 59s.

June 3.—Three miles, open to motor cycles—Percy Mack (Davidson), 1st. Walter Davidson (Davidson), 2nd. Time, 3m. 58 1/5s. Three-mile novelty race—Harry Nelson (Pope-Toledo), 1st. Chas. Weber (Pope-Toledo), 2nd. Time, 4m. 17s. Five-mile special match race between C. A. Coey and J. A. Ellis—J. A. Ellis (45-hp. Apperson), 1st. Time, 3m. 25 4/5s. C. A. Coey (50-hp. Thomas), 2nd. Time, 3m. 41 2/5s. Five miles, open—Soules (Pope-Toledo), 1st. Canary (Thomas Tornado), 2nd. Time, 5m. 19 2/5s. Three miles, for Rambler cars—Arthur Gardner, 1st. Clyde Leppo, 2nd. Time, 5m. 49s. Three miles, for Winton cars—Bate, 1st. Time, 5m. 38 4/5s. Three miles, open—McDuffee (Stoddard-Dayton), 1st. Merkel (Merkel), 2nd. Time, 4m. 47 2/5s. Five-mile handicap—Ellis (Apperson), 1st, scratch. Time, 5m. 41s. Weber (Pope-Toledo), 30s., 2nd. Five miles, open—Oldfield, 1st. Canary, 2nd. Time, 4m. 58s.

MINNEAPOLIS, MINN.

State Fair Grounds, August 18, 1904.—Summaries: Five miles, Minneapolis Automobile Derby, open to cars of 40-hp. or under—A. C. Webb (Pope-Toledo), 1st. Time, 7m. 9s. Prawlaski (Mercedes), 2nd. Time, 8m. 9 3/4s. One-mile dash, cars of 9-hp. or under—E. W. Young (9-hp. Ford), 1st. Time, 1m. 44 1/2s. W. G. Benz (9-hp. Ford), 2nd. Time, 1m. 50s. Two-mile dash, for cars of 12-hp. or under—E. H. Moulton, Jr. (10-hp. Franklin), 1st. Time, 3m. 32 1/4s. F. Joswich (10-hp. Franklin), 2nd. Time, 3m. 37 1/4s. Two-mile dash, for 16-hp. cars or under—Dave Thomas (16-hp. Rambler), 1st. Time, 3m. 19s. Ed. Clark (16-hp. Rambler), 2nd. Time, 3m. 20s. Five-mile dash, for cars of 90-hp. or under—A. C. Webb (60-hp. Pope-Toledo), 1st. Time, 5m. 7s. W. H. Winchester (10-hp. Franklin), 2nd. Time, 5m. 49s. One-mile challenge race, St. Paul vs. Minneapolis—A. C. Webb (24-hp. Pope-Toledo), 1st. Time, 1m. 28s. Ralph Bagley (20-hp. Packard), 2nd. Time, 1m. 29 1/2s. Three-mile dash, for cars of 20-hp. or under—Ralph Bagley (20-hp. Packard), 1st. Time, 4m. 25s. Joe Anderson (8-hp. Winston-Walker), 2nd. Time, 4m. 29 1/2s. Ten miles, touring car race, three passengers, full equipment, 30-hp. or under—Harry Pence (24-hp. Pope-Toledo), 1st. Time, 14m. 44 1/2s. Bergstrom (24-hp. Peerless), 2nd. Time, 14m. 55s. Two-mile dash, 90-hp. cars or under—A. C. Webb (60-hp. Pope-Toledo), 1st. Time, 2m. 3 1/4s. Winchester

Track Races—Minneapolis (Continued)

(10-hp. Franklin), 2nd. Time, 2m. 31s. Exhibition mile—A. C. Webb (60-hp. Pope-Toledo), 1st. Time, 1m. 1/2s. Three-mile dash, open to all cars of 24-hp. or under—Anderson (8-hp. Winston-Walker), 1st. Time, 4m. 19 1/2s. Young (9-hp. Ford), 2nd. Time, 4m. 25s. Two-mile motor cycle race—E. J. McCollan (St. Paul), 1st. Time, 3m. 31 1/2s. F. E. Hipkins (St. Paul), 2nd. Time, 3m. 50s.

NEWARK, N. J.

Waverley Park, September 3, 1906.—Summaries: Twenty-five mile handicap—F. C. Stowers (16-hp. Reo), 1st. Time, 37m. 44s. John Price, 2nd. Five miles, for cars costing \$750 to \$1,500—H. J. Koehler (22-hp. Buick), 1st. Time, 7m. 25 2/5s. Five-mile handicap for President J. H. Wood's cup, regularly equipped cars—H. J. Koehler (22-hp. Buick), 1st. Time, 7m. 16s. Five-mile race for regularly equipped cars costing \$1,400 to \$3,000—M. H. Apgar (25-hp. Pope-Hartford), 1st. Time, 7m. 30s. Ten-mile, free-for-all—James Ward (22-hp. Buick), 1st. Time, 14m. 14 2/5s. Five-mile handicap for the New Jersey Automobile and Motor Club trophy—John Price (24-hp. Autocar), 1st. Time, 6m. 51-5s.

Waverley Park, November 6, 1906.—Summaries: Five miles, for cars costing \$750 to \$2,500—Dr. C. R. Riveley (20-25-hp. Pope-Hartford), 1st. Time, 7m. 10s. H. J. Koehler (22-hp. Buick), 2nd. Five miles, for touring cars only, to carry four persons, each person to weigh at least 125 pounds—A. T. Burnam (45-hp. Jackson), 1st. Time, 7m. 11s. C. R. Borrough (24-hp. Packard), 2nd. Seven-mile handicap for runabouts—Clarence E. Fischer (24-hp. Packard), 1st. Time, 9m. 51s. H. J. Koehler (22-hp. Buick), 2nd. Ten-mile free-for-all—Ernest Keeler (55-hp. Oldsmobile), 1st. Time, 12m. 42s. R. A. Greene (30-35-hp. Locomobile), 2nd. Five miles, for cars costing from \$2,000 to \$5,000—E. J. Foley (26-hp. Oldsmobile), 1st. Time, 6m. 55s. Dr. C. R. Riveley (20-25-hp. Pope-Hartford), 2nd. Twenty-five-mile handicap, for cars costing from \$750 to \$5,000. Called off before being finished.

NEWPORT, R. I.

Acquidneck Park half-mile track, August 30, 1901.—Summaries: Three miles, for tricycles and two-wheeled vehicles—Kenneth Skinner (De Dion), 1st. G. M. Holley (gas bicycle), 2nd. Time, 5m. 40s. Three miles, for electric vehicles—Allan Blanding, 1st. Three miles, for steam propelled vehicles—J. McMillan

Track Races—Newport (Continued)

Hamilton, 1st. Five miles, for gasolene vehicles not developing more than 12-hp.—Alexander Fischer, 1st. E. Gray Dinsmore, 2nd. Time, 9m. 37s. Three miles, special class for De Dion 5-hp. voitur-ettes—Oliver H. P. Belmont, 1st. W. H. Vanderbilt, Jr., 2nd. Five miles, gaso-lene vehicles developing more than 12-hp.—W. K. Vanderbilt, Jr., 1st. Foxhall Keene, 2nd. Time, 7m. 36½s. Ten miles, championship for winners in all classes—W. K. Vanderbilt, Jr., 1st. Kenneth Skinner, 2nd. Time, 15m. 23½s.

NEW YORK, N. Y.

Brighton Beach one-mile track (Brook-lyn), August 23, 1902.—Summaries: Cars under 1,500 pounds, mile heats—L. P. Mooers (Peerless), 1st. Thomas Holden, Jr. (Locomobile), 2nd. Time, 1m. 38s. One-mile time trial—George C. Cannon (Cannon), 1st. Time, 1m. 8 3-5s., world's steam track record. Previous record, 1m. 39s. by T. E. Griffin (Locomobile), Chicago, Sept. 18, 1900. One-mile time trial—J. W. Howard (Howard), 1st. Time, 1m. 9 3-5s. Five miles, steam cars—J. W. Howard (Howard), 1st. Thomas Holden, Jr. (Locomobile), 2nd. Time, 9m. 5s. Five miles, gasolene cars under 1,000 pounds—Jacques Longuevez (De Dion), 1st. L. E. Holden (Orient), 2nd. Time, 8m. 30 2-5s. Five miles, gasolene cars between 1,000 and 2,000 pounds—F. A. La Roche (35-hp. Darracq), 1st. Percy Owen (15-hp. Winton), 2nd. Time, 6m. 42s. New track records in this class. Ten miles, free-for-all—H. S. Harkness (Mercedes-Simplex), 1st. F. A. La Roche (Darracq), 2nd. Time, 11m. 54 4-5s. Unlimited pursuit races—H. S. Harkness (Mercedes), 1st. J. W. How-ard (Howard), 2nd, caught at 5¾ miles in-7m. 13s. Obstacle race—W. F. Murphy (Locomobile), 1st. Time, 1m. 51 1-5s. One-mile time trial—George C. Cannon (Cannon), 1st. Time, 1m. 7 3-5s. World's track record for steam vehicles.

Empire City track, May 30, 1903.—Summaries: One-mile open class, gaso-lene cars under 1,000 pounds—G. C. Gould (4-hp. Orient), 1st. Dr. A. L. Nelden (5-hp. Northern), 2nd. Three-mile open class for gasolene cars, 1,000 to 1,800 pounds—J. Tracy (35-hp. Pan-hard-Levassor), 1st. Albert C. Bostwick (18-hp. Daimler), 2nd. Time, 3m. 50s. Five-mile open class for gasolene cars over 1,800 pounds, Oldfield and Wridg-way machines barred—A. Poole (40-hp. Daimler), 1st. L. Markle (18-hp. Mors), 2nd. Time, 6m. 23s. Five-mile motor bicycle race—G. H. Curtiss (5-hp. Cur-tiss), 1st. George N. Holden (1¾-hp. Hendee), 2nd. Time, 6m. 34s. Five-mile

Track Races—New York (Continued)

exhibition with motor cycle—Albert Champion. Time, 5m. 35s. Mile record trials, open to all cars—Laurent (60-hp. Mercedes), 1st. Time, 1m. 7s. A. C. Bostwick (18-hp. Mors), 2nd. Time, 1m. 12s. Special match race between Barney Oldfield and Charles G. Wridgway, five-mile heats—Barney Oldfield (Cooper), second heat and race, 1st. Time, 5m. 31s.

Empire City track, July 26, 1903.—Summaries: Five miles, for gasolene cars under 1,200 pounds—J. Wilkinson (10-hp. Franklin), 1st. L. O. Gitchell (16-hp. Darracq), 2nd. Time, 6m. 54 3-5s. Ten miles match race—J. Wilkinson (10-hp. Franklin), 1st. Joseph Tracy (10-hp. Renault), 2nd. Time, 15m. 15 1-5s. Ten miles, for gasolene cars under 1,800 pounds—Jules Sincholle (40-hp. Dar-racq), 1st. H. Page (40-hp. Decauville), 2nd. Time, 10m. 52 4-5s. Fifteen-mile match race—Laurent Grosso (60-hp. Mercedes), 1st. H. Page (40-hp. Decau-ville), 2nd. Time, 16m. 10 4-5s. Fifteen miles, for any weight and power, Old-field and La Roche cars barred—H. Page (40-hp. Decauville), 1st. George Papil-lon (35-hp. Darracq), 2nd. Time, 16m. 39 2-5s. Special match for silver trophy, emblematic of track championship of America, between Barney Oldfield and F. A. La Roche, five-mile heats—Barney Oldfield (Cooper), first heat, 1st. Time, 1m. 11 3-5s. Barney Oldfield (Cooper), second heat, 2nd. Time, 1m. 2 3-5s. Mile record trials, open to all—Laurent Grosso (60-hp. Mercedes), 1st. Time, 1m. 3 1-5s.

Empire City track, October 3, 1903.—Summaries: Five miles, special class for 16-hp. gasolene locomobiles—Archie Mc-Neil, Jr., 1st. De Ver H. Warner, 2nd. Time, 7m. 19 2-5s. Five miles, for cars of any motive power, weighing under 1,200 pounds—Joseph Tracy (24-hp. car), 1st. F. A. La Roche (24-hp. Darracq), 2nd. Time, 5m. 2 2-5s. Ten miles, for machines of any motive power, weighing under 1,800 pounds. Henri Page (40-hp. Decauville), 1st. Henry Cunningham (25-hp. Packard), 2nd. Time, 10m. 16 2-5s. New record for this class of machine on track. Ten-mile match race between Henri Page and Charles Schmidt—Henri Page (40-hp. Decauville), 1st. Charles Schmidt (25-hp. Packard Gray Wolf), 2nd. Time, 10m. 23s., breaking all track records for this class. Fifteen mile race, free-for-all—Barney Oldfield (40-hp. Win-ton Bullet II), 1st. Henri Page (40-hp. Decauville), 2nd. Time, 14m. 35s. Five miles, Great Empire handicap, free-for-all, for machines of any weight, any power and motive power—J. F. Plank (Cadillac), 1st. ¾-mile. Henri Page (De-

Track Races—New York (Continued)

cauville), 2nd, $\frac{1}{2}$ -mile. Time, 4m. 43 1-5s. One-mile record trials, open to all machines—Henri Page (Decauville), 1st. Charles Schmidt (Packard), 2nd. Time, 1m. 1s.

Brighton Beach (Brooklyn), October 31, 1903.—Summaries: Ten miles, for cars of any motive power, weighing under 1,800 pounds—M. G. Bernin (30-hp. Renault), 1st. F. A. La Roche (40-hp. Darracq), 2nd. Time, 11m. 23 2-5s. Five miles, gentlemen operators—F. A. La Roche (40-hp. Darracq), scratch, 1st. C. A. Hayden (10-hp. Franklin), 2nd, 3m. 20s. Time, 6m. 32 2-5s. Five miles, manufacturers' cup—F. A. La Roche (40-hp. Darracq), 1st. H. Cunningham (25-hp. Packard), 2nd. Time, 6m. 7 3-5s. Fifteen miles, free for all—M. G. Bernin (30-hp. Renault), 1st. F. A. La Roche (40-hp. Darracq), 2nd. Time, 16m. 18 1-5s. Three miles, special match race, steam cars—George G. Cannon (6-hp. car), 1st. John W. Howard (10-hp. car), 2nd. Time, 3m. 46 3-5s. Five miles, for cars of any motive power weighing under 1,200 pounds—F. A. La Roche (12-hp. Darracq), 1st. W. P. Harlow (16-hp. Darracq), 2nd. Time, 6m. 41 4-5s. Pursuit race, 1:13-16 miles, free for all—M. G. Bernin (30-hp. Renault), 1st. F. A. La Roche (40-hp. Darracq), 2nd. Five miles, open to members of Long Island Automobile Club—Charles A. Carlson (15-hp. Winton), 1st. C. H. Tangeman (16-hp. Fiat), 2nd. Time, 8m. 14 3-5s. Ten-mile handicap—Charles A. Carlson (15-hp. Winton), 4m. 20s., 1st. F. A. La Roche (40-hp. Darracq), 5s., 2nd. Time, 15m. 5s.

Empire City track, July 16 and 18, 1904.—Summaries: Ten miles, for cars of any motive power, from 881 to 1,432 pounds—M. G. Bernin (30-hp. Renault), 1st. Time, 10m. 13 2-5s. Guy Vaughn (40-hp. Decauville), 2nd. Time, 11m. 11 1-5s. Five miles, for Franklin stock cars—Harry Esselstyn, 1st. Time, 8m. 49 3-5s. Alfred F. Comacho, 2nd. Time, 8m. 51 1-5s. Fifteen miles, free for all, for cars of any motive power, weighing from 1,432 to 2,204 pounds—Paul Sartori (60-hp. Mercedes), 1st. Carl Meusel (60-hp. Mercedes), 2nd. Time, 14m. 44 2-5s. The winner kept on for twenty miles, smashing track records from sixteen miles to the finish, as follows: 15m. 41 2-5s., 16m. 39 4-5s., 17m. 38 4-5s., 18m. 37 1-5s., 19m. 37 1-5s. Empire handicap, free-for-all, no limitations—A. E. Morrison (Peerless), 1st. Time, 4m. 52 2-5s. W. G. Brokaw (Renault), 2nd. Time, 5m. 12 2-5s. Mile record trials

Track Races—New York (Continued)

—G. W. Brokaw (Renault), 1st. Time, 59s. George Arent (Mercedes), 2nd. Time, 59 2-5s.

Empire City track, Sept. 24, 1904.—Summaries: Stock cars selling for \$1,000 or less—Rodney Peeler (10-hp. Autocar), 1st. R. M. Alexander (Pope-Hartford), 2nd. Time, 8m. 15s. Five-mile race for the "Old Glory Cup"—Chas. Saules (24-hp. Pope-Toledo), 1st. A. E. Morrison (24-hp. Peerless), 2nd. Time, 7m. 12 3-5s. Ten-mile race for the Knickerbocker Cup—Joseph Tracy (30-hp. Renault), 1st. Time, 10m. 15s. Final for the International Cup, Italian, German, French and American cars competing in separate trial heats for each nationality at five miles, the winners competing in the final heat at ten miles—Tracy (Renault), 1st. Five-mile race for the Great Empire handicap—Sartori (Ford), 1st. Lee (Pope-Toledo), 2nd. Time, 8m. 2 1-5s.

Brighton Beach (Brooklyn), Oct. 22, 1904.—Summaries: One-mile handicap, for the Seabreeze Cup.—This was a prize handicap affair, an entry being allowed one yard handicap for each dollar it cost less than \$1,000, which was the limit-priced car eligible. Eight cars started, with an Autocar on scratch, and a Cameron the limit, at 350 yards—L. F. N. Baldwin (steam car), 1st. Time, 1m. 27 1-5s. Rodney (Peerless Autocar), scratch, 2nd. Time, 2m. 3-5s. Five-mile race for the Diamond Cup—Maurice Bernin (60-90-hp. Renault), 1st. Time, 5m. 8 3-5s. Oldfield (50-hp. Peerless Green Dragon), 2nd. Time, 5m. 54 2-5s. Race for the International cup, divided into three heats, of three miles each, and a final of five miles—Bernin (Renault), 1st. Time, 5m. 53 3-5s. Sartori (Italian car), 2nd. Time, 5m. 17 4-5s. Five miles, Brighton Handicap, was divided up into two heats and a final. Final heat—Phillip Adams (Standard), 1st. Time, 8m. 17s. Bernin (Renault), 2nd. Time, 8m. 19 1-5s.

Empire City track, Nov. 5, 1904.—Summaries: One-mile race for the Mt. Vernon cup, a prize handicap for cars retailing at \$1,000 or less without tonneau, a car allowed one mile handicap for each dollar below \$1,000—A. Comacho (6 $\frac{1}{2}$ -hp. Rainey), 350 yards, 1st. Time, 1m. 19 2-5s. L. C. Hutcheson (4 $\frac{1}{2}$ -hp. Oldsmobile), 350 yards, 2nd. Time, 1m. 39 4-5s. Ten miles, match race between Bernin (60-hp. Renault) and Sartori (90-hp. Mercedes)—Bernin, 1st. Time, 7m. 54 4-5s. International Cup race at five miles—Final heat, Frank Kulick (20-hp.

Track Races—New York (Continued)

Ford), 1st. Time, 4m. 48 2-5s. M. G. Bernin (60-hp. Renault), 2nd. Time, 4m. 48 3-5s. Ten-mile match race between Bernin and Sartori—Bernin (60-90-hp. Renault), 1st. Time, 9m. 54s. Five-mile Empire handicap—Vaughn (Decauville), 55 seconds, 1st. Time, 6m. 40 2-5s. Bernin (Renault), scratch, 2nd. Time, 6m. 41 2-5s.

Brighton Beach (Brooklyn), May 6, 1905.—Summaries: Two-mile exhibition—J. P. Bruyere (5-hp. motorcycle). Time, one mile, 1m. 11s., two miles, 2m. 28s. Five miles, open—Guy Vaughn (40-hp. Decauville), 1st. W. F. Winchester (20-hp. Franklin), 2nd. Time, 5m. 40s. Five-mile exhibition—Walter Christie, time, 11m. 2-5s. One mile heat race, scratch, for stock cars, winners to qualify for five-mile handicap—Oliver E. Bush (30-40-hp. Daimler), 1st. M. Roberts (40-hp. Thomas), 2nd. Time, 1m. 24 2-5s. Five-mile handicap, for stock cars—L. A. Mitchell (12-hp. Decauville), 2m., 1st. M. Roberts (40-hp. Thomas), 20s., 2nd. Time, 8m. 1 3-5s. Exhibition—Joe Nelson, first quarter, 15s., second quarter, 14s. Five miles, for cars weighing less than 1,432 pounds—Guy Vaughn (40-hp. Decauville), 1st. E. H. R. Green (20-hp. Franklin), 2nd. Time, 5m. 13 3-5s. Five miles, Brighton Beach handicap—William McIlvoid (38-hp. Royal), 2m. 20s., 1st. O. E. Bush (30-40-hp. Daimler), 2m., 2nd. Time, 9m. 3 1-5s.

Morris Park, first meet after conversion into an Autodrome, May 22, 1905.—Summaries: Flying-mile trials to beat the track record of 53 seconds—Chevrolet (90-hp. Fiat), 1st. Time, 52 4-5s. Webb Jay (White), 2nd. Time, 53s. One mile for amateur drivers owning their own cars—Richard Stevens (60-hp. Mercedes), 1st. Time, 1m. 9s. George I. Scott (60-hp. Mercedes), 2nd. Time, 1m. 21 2-5s. Five-mile match, in heats, Oldfield against Basle—Basle (90-hp. Mercedes), 1st. Time, 5m. 58 4-5s. Oldfield (90-hp. Peerless), 2nd. Time, 6m. 64-5s. Two-mile match, flying start—Guy Vaughn (40-hp. Decauville), 1st. Major C. J. S. Miller (30-hp. Renault), 2nd. Time, 2m. 21 3-5s. Five miles, Morris Park handicap—A. S. Winslow (Cadillac), 1st. Webb Jay (White), 2nd. Time, 8m. 22-5s. Three miles, for regularly equipped touring cars of 30-hp. and less, standing and start, loading and unloading passengers—L. Markle (18-hp. Peugeot), 1st. L. E. Van Sickles (30-hp. Pope-Toledo), 2nd. Time, 5m. 11 2-5s. Three miles, free-for-all—Chevrolet (90-hp. Fiat), 1st. Webb Jay (White), 2nd. Time, 2m. 51 4-5s.

Track Races—New York (Continued)

Empire City track, May 30, 1905.—Summaries: Two miles, dealers' handicap, cars allowed thirty yards' start for each \$100 that their price is under \$3,500—Goodman (National), 1st. Time, 2m. 45s. McIlvoid (Royal), 2nd. Time, 2m. 48 1-5s. Five miles, for Diamond cup, free-for-all—Guy Vaughn (40-hp. Decauville), 1st. Time, 5m. 21 1-5s. Dan Wurgis (32-hp. Reo), 2nd. Time, 5m. 41 4-5s. Three miles, for Westchester cup, for touring cars fully equipped, and carrying four passengers, start made from standstill, with engines dead—F. F. Goodman (24-hp. National), 1st. Time, 4m. 50 2-5s. C. A. Carlson (24-hp. Winton), 2nd. Time, 5m. 14 2-5s. Five miles, for the Yonkers cup, free-for-all—Dan Wurgis (32-hp. Reo), 1st. Time, 5m. 39 3-5s. C. G. Wridgway (24-hp. Peerless), 2nd. Three miles, for the Mount Vernon cup, cars weighing 881 to 1,432 pounds—Dan Wurgis (32-hp. Reo), 1st. Time, 3m. 20 4-5s. Guy Vaughn (40-hp. Decauville), 2nd. Time, 3m. 21s. Five miles, Empire City Handicap—W. S. Howard (20-hp. Ardsley), 67s., 1st. L. L. A. Mitchell (12-hp. Decauville), 33s., 2nd. Time, 7m.

Morris Park, July 3 and 4, 1905.—Summaries:

July 3.—Lightweight and middle-weight novice handicap—One lap, 1.39 miles—E. Parker (24-hp. Fiat), scratch, 1st. Frank Leland (7-hp. Stevens-Duryea), 45s., 2nd. Time, 1m. 38 3-5s. Heavyweight championship—four laps, 5.56 miles—Webb Jay (15-20-hp. White), 1st, last mile in 49 3-5 seconds. Louis Chevrolet (90-hp. Fiat), 2nd. Time, 5m. 1s. Time trial, one mile, motor cycle—Paul Bruyere, 1st. Time, 1m. 63-5s. Former record, 1m. 11s. Torists' novelty race, three laps, 4.17 miles—W. W. Swan (12-hp. Decauville), 1st. Time, 8m. 45s. Diamond cup, free-for-all, four laps, 5.56 miles—Webb Jay (15-20-hp. White), 1st. Time, 5m. 64-5s. Louis Chevrolet (90-hp. Fiat), 2nd. Chicago Automobile Club vs. Automobile Club of America, four laps, 5.56 miles, for the Dr. Harold E. Thomas inter-club trophy—Webb Jay, Chicago Automobile Club (15-20-hp. White), 1st. Time, 5m. 55 4-5s. Walter Christie, Automobile Club of America, led for a lap and a half, when a puncture forced him to stop. Unlimited pursuit race—Guy Vaughn (40-hp. Decauville) caught Eddie Bald (35-40-hp. Columbia) in 3 1-3 laps. Time, 5m. 21s. Bronx handicap, four laps, 5.56 miles, open to all—Alfred Comacho (12-hp. Franklin), scratch, 1st. Frank Leland (7-hp. Stevens-Duryea), 3m., 2nd.

Track Races—New York (Continued)

Time, 7m. 11 4-5s. Trial for one mile flying start record—Walter Christie (120-hp. Christie), Time, 52 1-5s., equaling the record.

July 4.—National circuit championship, free-for-all, four laps, 5.56 miles—Webb Jay (15-20-hp. White), one lap walkover. Time, 1m. 43 3-5s. Cracker handicap, three laps, 4.17 miles, open to all—Larry Hill (30-hp. Simplex), 30s., 1st. Guy Vaughn (40-hp. Decauville), scratch, 2nd. Time, 7m. 22s. Middleweight championship, 851 to 1,432 pounds, three laps, 4.17 miles—E. Parker (24-hp. Fiat Junior), 1st. Guy Vaughn (40-hp. Decauville), 2nd. Time, 4m. 10 2-5s. Chicago Automobile Club vs. Automobile Club of America, four laps, 5.56 miles, for the Dr. Harold E. Thomas inter-club trophy—Webb Jay, Chicago Automobile Club (15-20-hp. White), 1st. Walter Christie, Automobile Club of America, 2nd. Time, 5m. 28 1-5s. One mile flying start record trials—Webb Jay (15-20-hp. White), 1st. Time, 48 4-5s. Alfred Comacho (12-hp. Franklin), 2nd. Time, 1m. 15 3-5s.

Empire City track, Oct. 27, 1906.—Summaries: One hundred miles for stripped touring cars—H. J. Koehler (22-hp. Buick), 1st. Time, 2h. 5m. 31 3-5s. E. Keeler (40-hp. Oldsmobile), 2nd. Time, 2h. 5m. 47s. Three miles, for stock cars selling for \$1,500 or less—H. J. Koehler (22-hp. Buick), 1st. Time, 4m. 17 1-5s. L. C. Hutcheson (8-hp. Oldsmobile), 2nd. Time, 4m. 30s. Five miles, for stock cars selling for \$3,500 to \$5,000—M. Roberts (60-hp. Thomas), 1st. Time, 5m. 49 4-5s. C. G. Wridgway (45-hp. Peerless), 2nd. Time, 5m. 51 4-5s. Five miles, for American cars—E. Keeler (40-hp. Oldsmobile), 1st. Time, 5m. 36 3-5s. C. G. Wridgway (45-hp. Peerless), 2nd. Time, 6m. 18s. Five miles, for foreign cars—Cedrino (24-hp. Fiat), 1st. Time, 4m. 56 4-5s. Bernin (60-hp. Renault), 2nd. Time, 5m. 53 5-5s. Five miles dealers' handicap—M. Roberts (60-hp. Thomas), scratch, 1st. Time, 6m. 20 4-5s. G. J. Scott (36-hp. Glide), 10s., 2nd. Time, 7m. 14s. Five miles, international—Cedrino (24-hp. Fiat), 1st. Time, 4m. 57s. Bernin (60-hp. Renault), 2nd. Time, 5m. 11 4-5s.

Empire City track, Nov. 6, 1906.—Summaries: One hundred mile race, for stripped touring cars—C. G. Embleton (30-hp. Packard), 1st. Time, 2h. 2m. 55 1-5s. Charles G. Wridgway (45-hp. Peerless), 2nd. Time, 2h. 6m. 57 3-5s. Five miles, for foreign cars—Maurice Bernin (60-hp. Renault), 1st. Time, 6m.

Track Races—New York (Continued)

30 3-5s. A. M. Thackara, Jr. (40-hp. Westinghouse), 2nd. Time, 6m. 33 2-5s. Five miles, for stock cars of 25-hp. or under—Hon. C. S. Rolls (20-hp. Rolls-Royce), 1st. Time, 5h. 51m. 45s. L. C. Hutcheson (8-hp. Oldsmobile), 2nd. Time, 7m. 12s. Five miles, for American cars—C. G. Embleton (30-hp. Packard), 1st. Time, 6m. 12 1-5s. C. G. Wridgway (45-hp. Peerless), 2nd. Time, 6m. 21 2-5s. Five miles, dealers' handicap, for fully equipped cars of any design—C. G. Embleton (30-hp. Packard), scratch, 1st. Time, 5m. 40 2-5s. L. C. Hutcheson (8-hp. Oldsmobile), 2nd. Time, 1m. 30s. Five miles, for stock cars from 25-hp. to 40-hp.—C. G. Embleton (30-hp. Packard), 1st. Time, 5m. 37s. Guy W. Vaughn (30-hp. Stearns), 2nd. Ten miles, international race—Maurice Bernin (60-hp. Renault), 1st. Time, 11m. 16 2-5s. C. G. Embleton (30-hp. Packard), 2nd. Time, 11m. 34s.

Brighton Beach (Brooklyn), Aug. 9 and 10, 1907.—Summaries: Ten miles, runabouts, 35-hp. and under—Guy Vaughn (30-hp. Stearns), 1st. Time, 11m. 23s. Ten miles, Manhattan championship for runabouts, 60-hp. and under, fully equipped—Guy Vaughn (30-hp. Stearns), 1st. Time, 12m. 11 1-5s. Five miles, Atlantic Sweepstakes—Guy Vaughn (30-hp. Stearns), 1st. Time, 5m. 11s. One hundred miles, open to stock touring cars and runabouts, 60-hp. and under—H. Michener (60-hp. Lozier), 1st. Time, 2h. 6m. 21s. Twenty-four-hour race—Thomas, 1st, 997 miles; Lozier, 2nd, 972 miles; Jackson, 3rd, 966 miles; Mitchell, 4th, 744 miles; Delahaye, 5th, 560 miles; Darracq, 6th, 720 miles; Oldsmobile, 7th, 503 miles; Welch, 8th, 446 miles; Matheson, 9th, 392 miles; De Dietrich, 10th, 311 miles; Oldsmobile, 11th, 271 miles; Frayer-Miller, 12th, 269 miles; Pilain, 13th, 219 miles; Stoddard-Dayton, 14th, 216 miles; Lozier, 15th, 177 miles.

Morris Park, Sept. 6 and 7, 1907.—Summaries: Invitation race for De Dietrich cars, handicap at 4 laps, about 5½ miles—George Mack (60-hp. car, 5s., 1st. Time, 6m. 56 2-5s. George Robertson (60-hp. car), scratch, 2nd. Time, 6m. 57 2-5s. Time trials, against Morris Park mile gasoline track record of 52 1-5s, held jointly by Louis Chevrolet (Fiat) and Walter Christie (Christie)—George Robertson (120-hp. Hotchkiss), 1st. Time, 59 1-5s. A. L. Campbell (40-hp. Allen-Kingston), 2nd. Time, 1m. 10 2-5s. Thirty-six laps, about 50 miles, gasoline car championship—George

Track Races—New York (Continued)

Mack (60-hp. De Dietrich), 1st. Time, 56m. 49.4-5s. Maurice Bernin (35-hp. Renault), 2nd. Time, 60m. 35s. Match at four laps, about 5½ miles—J. B. Ryall (60-hp. Matheson), 1st. Time, 6m. 17.2-5s. Wally Owen (50-hp. Haynes), 2nd. Time, 6m. 51s. Two miles, national flexibility trials, for silver cup offered by Winthrop E. Scarritt, gasoline touring cars or runabouts, 4 cylinders or less—Philip Hines (25-30-hp. Pope-Hartford), 1st. William Swan (30-60-hp. Stearns), 2nd. Twenty-four-hour race—M. H. Bernin and Paul La Croix (35-hp. Renault), 1st, 1,079 miles. W. Smelzer and W. Linkroum (40-hp. Lozier), 2nd, 972 miles. H. J. Kilpatrick and H. Harkness (35-hp. Hotchkiss), 3rd, 892 miles. A. L. Campbell and C. H. Belden (35-hp. Allen-Kingston), 4th, 681 miles.

Morris Park, Sept. 27 and 28, 1907.—Summaries: Three laps, about 4.17 miles, for Ford four-cylinder runabouts—Frank Dunnell, 1st. Walter Livingston, 2nd. Time, 8m. 7s. Eight-lap road race, over Allen course, about 10 miles (limited to cars of 5½-inch bore and 45-hp. or less)—Wallie H. Owen (40-hp. American Mors), 1st. N. Crane (45-hp. English Daimler), 2nd. Time, 22m. 13s. Three-lap motorcycle race, single cylinder machines of less than 30½ inches piston displacement—Walter Goerk (2½-hp. Indian), 1st. Time, 5m. 35s. J. L. Siddell (1¼-hp. Indian), 2nd. Time, 5m. 43.1-5s. Mile trials—George Robertson (120-hp. Hotchkiss), 1st. Time, 52s. New track record. William Wallace (60-80-hp. Darracq), 2nd. Time, 54s. and 1m. 1¼s. Twenty-five miles, 18 laps, open to stock cars of 60-hp. or less—Guy Vaughn (30-hp. Stearns), 1st. Time, 27m. 54.1-5s. George Fentle (30-hp. Packard), 2nd. Time, 28m. 39s. Twenty-four hour race—Cedrina and Parker (35-hp. Fiat), 1st, 984 miles. Holm and Ditmar (35-hp. Studebaker), 2nd, 878 miles. Zumbach and Carrier (40-hp. Itala), 3rd, 873 miles. Knipper and Webster (50-hp. Frazer-Miller), 4th, 756 miles. Campbell and Blakeley (30-35-hp. Allen-Kingston), 5th, 745 miles.

OMAHA, NEB.

Omaha Driving Park, Aug. 23, 1904.—Summaries: Two mile match race between Arthur Gardner and H. E. Frederickson—Arthur Gardner, 1st. Time, 3m. 8s. Two mile, stop and start race for gasoline engines, each car carrying full equipment and four passengers, who were unloaded at each half mile, the car and engine being stopped and started

Track Races—Omaha (Continued)

with crank—H. E. Frederickson, 1st. Tom Bromwell, 2nd. Time, 6m. 53-5s. One mile, for one-cylinder cars, carrying less than 1,300 pounds, with full equipment—Guy Smith, 1st. A. W. Smith, 2nd. Time, 2m. 7.1-5s. Special time trial—Frank Decker. Time, 1m. 37s. A. C. Webb, effort to smash the record—Webb went two miles, but failed to equal the record made by Oldfield on the Omaha track, though he beat the best previous record. Time, 1st mile, 1m. 16.1-5s.; 2nd mile, 1m. 15.4-5s. Pursuit race for stock cars, stripped, not over 20-hp.—H. E. Frederickson, 1st. Arthur Gardner, 2nd. Five miles, extra, scratch start, between Gardner, Frederickson and Decker—Arthur Gardner, 1st. H. E. Frederickson, 2nd. Time, 8m. 1-5s. Five miles, for touring cars, fully equipped—Dr. Gilmore, 1st. J. J. Deright, 2nd. Time, 9m. 43s.

PEORIA, ILL.

One mile track, August, 1905.—Summaries: Two miles, for runabouts—S. K. Hatfield (Cadillac), 1st. F. K. Whiting (Cadillac), 2nd. Time, 4m. 25s. Two miles, for touring cars—C. A. Bartholomew (Glide), 1st. F. K. Whiting (Cadillac), 2nd. Time, 3m. 45½s. One mile, for motorcycles—Charlie Harr, 1st. Time, 1m. 35s.

PHILADELPHIA, PA.

Point Breeze one mile track, May 30, 1904.—Summaries: Five miles, for gasoline stock cars, any motive power, 8-hp. or under—E. Wilkie (8-hp. Cadillac), 1st. Mullin (8-hp. Ford), 2nd. Time, 8m. 30s. Five miles, for stock cars, any motive power, 12-hp. or under—J. Wilkinson (10-hp. Franklin), 1st. Webb Jay (10-hp. White), 2nd. Time, 7m. 9.1-5s. Five miles, special, open to all—Barney Oldfield (80-hp. Winton Bullet), 1st. Hillyard (40-hp. Decauville), 2nd. Time, 6m. 15.1-5s. Five miles, for stock cars, any motive power, 16-hp. and under—Wilkinson (10-hp. Franklin), 1st. Stevens (16-hp. Ford), 2nd. Time, 7m. 44.4-5s. Five miles, special, racing cars only—Huggins (40-hp. Decauville), 1st. Barney Oldfield (80-hp. Winton), 2nd. Time, 19m. 27s. Five miles, for stock cars, 20-hp. or under, any motive power—Wilkinson (10-hp. Franklin), 1st. Jay Webb (10-hp. White), 2nd. Time, 6m. 58s. Five miles, for stock cars, any motive power, 20-hp. or over—Webb Jay (10-hp. White), 1st. R. J. Maynes (24-hp. Peerless), 2nd. Time, 6m. 36.3-5s. Special, for glory—Huggins (40-hp. Decauville), 1st. Wilkinson (10-hp. Franklin), 2nd. Time, 6m. 39.3-5s.

Track Races—Philadelphia (Continued)

Point Breeze track, Nov. 12, 1906.—Summaries: Fifty miles race—William E. Wallace (40-60-hp. Darracq), 1st. Time, 1h. 1m. 20 2-5s. (A new world's track record.) Ernest Keeler (40-hp. Oldsmobile), 2nd. Time, 1h. 2m. 41 2-5s. Mile exhibition—Walter Christie. Time, 1m. 8s. Three-mile race for gasoline cars costing \$1,500—11-hp. Buick, 1st. Time, 4m. Three-mile handicap race for steam cars—White, start of 200 yards, 1st. Stanley, scratch, 2nd. Two-mile race for antique cars, open only to cars built not later than 1904—28-hp. Mercedes, 1st. Time, 2m. 52 2-5s. Five-mile free-for-all—20-hp. Stanley, 1st. Race of five miles for Elsie Janis Cup—30-hp. Packard, 1st. Time, 6m. 9 4-5s. Five-mile event between a Mercedes and Darracq—Darracq, 1st. Time, 6m. 35 2-5s. Five-mile event for American touring cars—D. Walter Harper (Stanley), 1st. W. Owen (Jackson), 2nd.

PITTSBURGH, PA.

Highland Park course, 2,204 feet, June 20, 1903.—Summaries: Electric cars—A. L. Banker (Waverley), 1st. Time, 3m. 3s. Harry A. Marlin, 2nd. Time, 4m. 18 1-5s. Steam cars—W. H. Artzberger, 1st. Time, 2m. 12 3-4s. R. uben Miller, Jr., 2nd. Time, 2m. 15s. Gasolene cars under 1,000 pounds—A. S. Stewart, 1st. Time, 3m. 37s. Ed. Haus, 2nd. Time, 3m. 39 4-5s. Gasolene cars, 1,000 to 1,500 pounds—F. T. F. Lovejoy (Pierce), 1st. Time, 2m. 29s. D. H. Hostetter (Franklin), 2nd. Time, 3m. 9 1-5s. Gasolene cars, 1,000 to 2,000 pounds—F. A. McCune (Darracq), 1st. Time, 2m. 21 1-5s. W. L. Mellon, 2nd. Time, 2m. 26s. Gasolene cars exceeding 2,000 pounds—A. E. Maston (Peerless), 1st. Time, 2m. 11s. Finals, the first and second in each class contesting—Turner (Peerless), 1st. Time, 2m. 10 3-5s. McCune (Darracq), 2nd. Time, 2m. 19 2-5s.

Beechwood Boulevard, Highland Park, July 11, 1903.—Summaries: Electrics, under 1,500 pounds—J. H. Lindsay (3-hp. Centaur), 1st. Time, 2m. 1 2-5s. L. G. Martin (2 1/2-hp. Columbia), 2nd. Time, 2m. 3 1-5s. Electrics, over 1,500 pounds—L. E. Reineman (3-hp. Pope), 1st. Time, 2m. 14s. Steam cars, under 1,200 pounds—W. H. Artzberger (6-hp. Artzberger), 1st. Time, 1m. 41 1-5s. Steam cars, over 1,200 pounds—J. H. Lindsay (10-hp. White), 2nd. Time, 1m. 40 3-5s. Gasolene cars, under 1,000 pounds—A. L. Banker (4-hp. Olds), 1st. Time, 1m. 51 4-5s. Gasolene cars, between 1,000 and 1,500 pounds—F. H. Guffey (10-hp. Deauville), 1st. Time, 2m. 10 4-5s. Gasolene

Track Races—Pittsburgh (Continued)

cars, between 1,500 and 2,000 pounds—A. L. Banker (32-hp. Peerless), 1st. Time, 1m. 21 4-5s. Gasolene cars, over 2,000 pounds—A. R. Neeb (16-hp. Peerless), 2nd. Time, 1m. 37 3-5s. Free-for-all—A. L. Banker (32-hp. Peerless), 2nd. Time, 1m. 17s.

Brunto's Island track, June 28 and 29, 1905.—Summaries:

June 28.—Five miles, for stock gasolene cars, up to 22-hp.—W. F. Winchester (12-hp. Franklin), 1st. Leonard Gardner (12-hp. Franklin), 2nd. Time, 8m. 37 2-5s. Five miles, for stock gasolene cars, up to 28-hp.—D. P. Collins (24-hp. Peerless), 1st. F. Hodge (24-hp. Pierce), 2nd. Time, 6m. 44 2-5s. Five-mile National A. A. A. championship—Barney Oldfield (60-hp. "Green Dragon" Peerless), 1st. Time, 4m. 50 2-5s. Ten miles, for stock gasolene cars, up to 30-hp.—D. P. Collins (24-hp. Peerless), 1st. F. Hodge (24-hp. Pierce), 2nd. Time, 12m. 32 2-5s. Five-mile Cupid race for touring cars—Lester Wilson (40-hp. Pierce), 1st. E. Haus (28-32-hp. Pierce), 2nd. Time, 7m. 38 1-5s. Five-mile handicap—W. F. Winchester (12-hp. Franklin), 1st. Actual time made by the scratch car, 6m. 3 3-5s. Charles Soules (30-hp. Pope-Toledo), 2nd. Ten-mile free-to-all—Louis Chevrolet (90-hp. Fiat), 1st. Barney Oldfield (60-hp. Peerless), 2nd. Time, 10m.

June 29.—Two miles, for stock gasolene cars, up to 22-hp.—W. F. Winchester (12-hp. Franklin), 1st. Leonard Gardner (12-hp. Franklin), 2nd. Time, 3m. 22s. Ten miles, for stock gasolene cars, up to 28-hp.—D. P. Collins (24-hp. Peerless), 1st. F. Hodge (24-hp. Pierce), 2nd. Time, 13m. 43 3-5s. Ten mile, National A. A. A. championship—Louis Chevrolet (90-hp. Fiat), 1st. Barney Oldfield (60-hp. "Green Dragon" Peerless), 2nd. Time, 9m. 53 2-5s. Five miles, for stock gasolene cars, up to 36-hp.—Charles Soules (30-hp. Pope-Toledo), 1st. E. Haus (28-32-hp. Pierce), 2nd. Time, 6m. 34 3-5s. Five mile, special handicap—Charles Soules (30-hp. Pope-Toledo), scratch, 1st. W. F. Winchester (12-hp. Franklin), 35s., 2nd. Time, 6m. 35 3-5s. Three mile handicap—W. F. Winchester (12-hp. Franklin), 20s., 1st. F. Hodge (24-hp. Pierce), 25s., 2nd. Time, 3m. 51 2-5s. Five mile free-for-all—Louis Chevrolet (90-hp. Fiat), 1st. Barney Oldfield (60-hp. Peerless), did not finish. Time, 5m. 12s. Three-mile exhibition, special event—Charles Soules (30-hp. Pope-Toledo). Time, 3m. 26s.

PROVIDENCE, R. I.

Narragansett Park one mile track, Oct. 17 and 18, 1901.—Summaries:

Oct. 17.—Five miles, for electrics—H. H. Rice (Waverley), 1st. Time, 14m. 51s. Albert L. Russell (Waverley), 2nd. Five miles, for steam cars—George C. Cannon (Special), 1st. Time, 9m. 40 3-5s. H. G. Martin (Locomobile), 2nd. Time trials, ten miles (record, 12m. 45 2-5s.)—A. C. Bostwick (40-hp. Winton). Time, 14m. 10 3-4s. Fastest mile (ninth), 1m. 15 3-4s. Record ride—H. Fournier (60-hp. Mors). Time, one mile, 1m. 9s.; two miles, 2m. 18s.; three miles, 3m. 27 3-4s.

Oct. 18.—Five miles, for gasoline carriages of 12-hp. and under—Percy Owen (Winton), 1st. Rudolph Meyer (Gasomobile), 2nd. Time, 8m. 51s. Ten miles, sweepstakes final, for winners in all classes—Kenneth A. Skinner (tricycle with 4 1-2-hp. De Dion gasoline motor), 1st. Percy Owen (12-hp. Winton), 2nd. Time, 13m. 37 1-2s. Record trial—H. Fournier (60-hp. Mors). Time, for nine miles, 10m. 43 1-2s.; fastest mile, 1m. 7 1-2s. Five miles, special class, for gasoline carriages under 6-hp.—Kenneth Skinner (4 1-2-hp. tricycle De Dion motorette), 1st. T. Shaw Safe (4 1-2-hp. De Dion motorette), 2nd. Time, 12m. 57 1-4s. Five miles, for motor tricycles—Kenneth A. Skinner (4 1-2-hp. De Dion tricycle), 1st. Peter J. Berlo (De Dion tricycle), 2nd. Time, 6m. 54 1-2s.

Narragansett Park, Sept. 24, 1902.—Summaries: Five miles, for motor bicycles—G. M. Holden (Indian), 1st. John M. Farr (Orient), 2nd. Time, 6m. 34 2-5s. Two miles, open class electrics—Knight Neftel (Neftel), 1st. W. G. Titcomb (Waverley), 2nd. Time, 4m. 23s. Three miles, regulation stock steam cars—American Cycle Manufacturing Co. (Toledo), 1st. Locomobile Co. of America (Locomobile), 2nd. Ten miles, for World's record—Alexander Winton. Time by miles: 1m. 6 1-2s., 2m. 11s., 3m. 17 3-5s., 4m. 25s., 5m. 30 3-4s., 6m. 39s.; then attempt abandoned. Five miles, for gasoline carriages under 1,300 pounds—J. Stevens Tool Co. (Stevens-Duryea), 1st. H. H. Shattuck (Oldsmobile), 2nd. Time, 7m. 42 1-2s. One mile, for world's record—G. C. Cannon. Time, 1m. 5 1-4s. Five miles, for Winton touring cars—F. Tudor, Jr., 1st. J. B. Mills, 2nd. Time, 9m. 13 3-4s. Five miles, for gasoline cars over 1,300 pounds, limited to 30-hp.—Percy Owen (Winton Pup), 1st. Auto Headquarters (Stearns), 2nd. Time, 6m. 25 3-4s. Track record. Five miles, to beat the world's record—G. C. Cannon. Time, 6m. 5s. Five miles, for gasoline cars, free-for-all—Percy Owen (Winton Pup),

Track Races—Providence (Continued)

1st. Alex. Winton (Winton Bullet), 2nd. Time, 6m. 43 1-2s. Five miles, for winners, sweepstakes—Percy Owen (Winton), 1st.

Narragansett Park, Sept. 19, 1903.—Summaries: Five miles, for gasoline cars, 1,200 pounds or under—A. R. Bangs (Franklin), 1st. L. H. Roberts (Orient), 2nd. Time, 6m. 25 2-5s. Five miles, for motor bicycles—J. Dero-cius (Metz), 1st. James Meyers (Orient), 2nd. Time, 6m. 14s. Two miles, electric class—C. A. Thompson (Waverley), 1st. A. L. Feitheim (Waverley), 2nd. Time, 4m. 48 4-5s. Three miles, steam, all weights—George C. Cannon (Special), 1st. Louis S. Ross (Stanley), 2nd. Time, 4m. 49 4-5s. Five miles, all motive powers, under 1,800 pounds—Henri Page (Decauville), 1st. F. A. La Roche (Darracq), 2nd. Time, 5m. 28 4-5s. Ten miles, all weights, all motive power—Henri Page (Decauville), 1st. Charles Schmidt (Packard), 2nd. Time, 10m. 48 4-5s.; fastest mile, 1m. 3 3-5s. Five miles, invitation race; Peerless touring cars, owners driving—H. Emmett Ros-sell, 1st. E. Hylan, 2nd. Time, 8m. 18s. Five miles, match race—F. A. La Roche (Darracq), 1st. Charles Schmidt (Packard), 2nd. Time, 5m. 32 1-5s.; fastest mile, 1m. 5 1-5s.

Narragansett Park, Sept. 12, 1904.—Summaries: Electric cars—W. B. Shaw, 1st. Time, 2m. 15s. Five miles, for gasoline cars weighing 551 to 881 pounds—Frank Kulick (20-hp. Ford), 1st. Time, 5m. 27 2-5s. The Ford drew a bye, the other entries not appearing, which placed the Ford in the final heat. Second heat—Joseph St. George (Renault), 1st. Time, 5m. 21 3-5s. Five-mile special match race between A. S. Lee and A. E. Morrisson—A. S. Lee (Pope-Toledo), 1st. Time, 6m. 25 4-5s. A. E. Morrisson (Peerless), withdrew. Mile exhibition—E. Tom Fetch ("Old Reliable" Packard). Time, 6m. 43 2-5s.

Dec. 3, 1904.—Summaries: Electric cars—Arthur Feltham (Waverley). Time, 1m. 11 4-5s. R. L. Lippitt (Waverley). Time, 1m. 43s. Steam—Blackinton (Stanley). Time, 47 4-5s. Baldwin (Stanley). Time, 52s. Gasolene, light cars—Lippitt (Franklin). Time, 1m. 29s. Rissly (Columbia). Time, 1m. 32s. Gasolene, heavy cars—Adams (Pope-Toledo). Time, 48s. Snow (Peerless). Time, 48s.

Narragansett Park, Sept. 23, 1905.—Summaries: Five miles, for stock cars, catalog equipment, selling at \$2,000 or under—George C. Reed (Stearns), 1st.

Track Races—Providence (Continued)

Eddie Bald (Columbia), 2nd. Time, 5m. 53.2-5s. Five miles, for Stanley steamers, invitation—W. B. Files, 1st. F. F. Ladd, 2nd. Time, 9m. 12.4-5s. Five miles, for gasoline cars, catalog equipment—H. A. Capron (Franklin), 1st. Eddie Bald (Columbia), 2nd. Time, 7m. 45.2-5s. Five miles, free-for-all—E. Cedrino (Fiat), 1st. W. H. Hilliard (Napier), 2nd. Time, 5m. 2.2-5s. Five miles, for stock cars, catalog equipment, costing from \$1,800 to \$2,000—C. D. Snow (Stevens-Duryea), 1st. Cliff Edwards (Ford), 2nd. Time, 7m. 19.4-5s. Five miles, match race—Edward Shay (Fiat), 1st. Time, 6m. 11.3-5s. Five miles, for national championship—Barney Oldfield (Peerless), 1st. Cedrino (Fiat), 2nd. Time, 4m. 43s.

SAN FRANCISCO, CAL.

Nov. 6, 7 and 8, 1904.—Summaries:

Nov. 6.—Two miles, gasoline, 6½-hp. and under—W. S. Hunt (Oldsmobile), 1st. C. S. Luckhardt (Rambler), 2nd. Time, 3m. 27.1-5s. Five miles, open, 1,200 pounds and under—W. F. Winchester (Franklin), 1st. R. F. Luckhardt (St. Louis), 2nd. Time, 8m. 50.1-5s. Five miles, handicap for motorcycles—Thomas A. White (Rambler), 30s., 1st. E. M. Coffin (Duck), scratch, 2nd. Time, 10m. 16.4-5s. Five miles, gasoline, 24-hp. and under—W. E. Saunders (Toledo), 1st. W. F. Winchester (Franklin), 2nd. Time, 6m. 46.4-5s. Five miles, open, 1,800 pounds and under—Walter Grothe (White), 1st. Barney Oldfield (Winton), 2nd. Time, 6m. 4.2-5s. Five miles, open, for cars owned in California—W. E. Saunders (Toledo), 1st. F. A. Garbutt (White), 2nd. Time, 6m. 25.1-5s. Ten miles, open—Barney Oldfield (Winton), 1st. William Graham (Winton), 2nd. Time, 11m. 15.1-5s. Fastest mile, 1m. 1-5s. Five miles, handicap, open to all cars having participated in any of the foregoing races, and which are legitimately owned on the Pacific Coast—C. C. Eib (Oldsmobile), 2m. 30s., 1st. Pierre Desmet (Mors), 2nd. Time, 8m. 46.2-5s.

Nov. 7.—Three miles, open, 6½-hp. and under—W. Grothe (White), 1st. W. S. Hunt (Oldsmobile), 2nd. Time, 5m. 25s. Five miles, gasoline, 1,200 pounds and under—W. F. Winchester (Franklin), 1st. R. Fowler (Franklin), 2nd. Time, 7m. 59.1-5s. Five miles, handicap, for motorcycles—Thomas A. White (Rambler), 1st. A. H. Sampson (Rambler), 2nd. Five miles, open, 1,800 pounds and under—Barney Oldfield (Winton Bullet No. 3), 1st. Pierre Desmet (Mors), 2nd. Time, 5m. 41.4-5s.

Track Races—San Francisco (Cont)

Five miles, open, 24-hp. and under—W. E. Saunders (Toledo), 1st. A. Garbutt (White), 2nd. Time, 6m. 24.1-5s. Ten miles, open—Barney Oldfield (Winton Bullet No. 2), 1st. William Graham (Winton Bullet No. 3), 2nd. Time, 10m. 19.1-5s. Five-mile handicap, open to all cars having participated in any of the foregoing races, and legitimately owned on the Pacific Coast—W. H. Kellogg (Buckboard), 3m. 45s., 1st. W. E. Saunders (Toledo), scratch, 2nd. Time, 9m. 24s.

Nov. 8.—Five miles, handicap, motorcycles—Montie Fink (California), 4m. 30s., 1st. A. H. Sampson (Rambler), 2nd. Two-mile, special novelty race—W. W. Everett (Autocar), 1st. William Powers (Autocar), 2nd. Five miles, open, for cars owned in California—W. Grothe (White), 1st. H. D. Ryus (White), 2nd. Time, 6m. 30.4-5s. Two-mile special novelty race, gasoline touring cars only—George Fuller (Winton), 1st. C. R. Scott (Winton), 2nd. Time, 3m. 57.4-5s. Ten miles free-for-all—Barney Oldfield (Winton), 1st. Time, 9m. 51.1-5s.; fastest mile, 56s. Five miles, gasoline, 35-hp. and under—W. E. Saunders (Toledo), 1st. W. F. Winchester (Franklin), 2nd. Time, 8m. 25.4-5s. Five miles, steam—H. D. Ryus (White), 1st. W. Grothe (White), 2nd. Time, 7m. 22.2-5s. Ten miles, handicap, free-for-all—Pierre Desmet (Mors), 1st. R. Fowler (Franklin), 2nd.

ST. LOUIS, MO.

Aug. 28, 1904.—Summaries: Five miles, vehicles weighing 881 to 1,342 pounds—W. F. Winchester (10-hp.), 1st. G. P. Dorris (24-hp.), 2nd. Time, 6m. 33½s. Three mile exhibition—Barney Oldfield. Time, 3m. 15.2-5s. Five mile, flying start, stock cars weighing 881 to 1,432 pounds—Webb Jay (10-hp.), 1st. G. B. Dorris (24-hp.), 2nd. Time, 7m. 16s. Ten miles, flying start, Louisiana Purchase exposition, vehicles weighing 1,432 to 2,204 pounds—A. C. Webb (60-hp.), 1st. Webb Jay (10-hp.), 2nd. Time, 10m. 52s. Ten-mile lap race, all types weighing 881 to 1,432 pounds—Webb Jay (10-hp.), 1st. W. W. Leather, 2nd. Time, 15m. 12s. Five-mile motorcycle race—H. Maher (1¼-hp.), 1st. A. L. Jordan (1¼-hp.), 2nd. Time, 7m. 26½s.

ST. PAUL, MINN.

Hamline Track, July 8 and 10, 1905.—Summaries:

July 8.—Three-mile novelty race for fully equipped touring cars, three passengers to dismount at end of each mile—Barney Oldfield, 1st. Fawkes Auto-

Track Races—St. Paul (Continued)

mobile Company's car, 2nd. Time, 6m. 12s. Five-mile handicap, limited to cars which took part in the tour from Chicago—E. F. Schueffler, 50s., 1st. Dr. A. C. Lee, 60s., 2nd. Time, 8m. 25s. Five miles, 'manufacturers' and dealers' race for stripped stock cars—C. A. Coey, 1st. Dick Ferris, 2nd. Time, 6m. 10s. Three miles, for cars weighing under 1,432 pounds—J. Stinson, 1st. Charles Joy, 2nd. Time, 4m. 35s. Five miles, for Twin City challenge cup—Earl Kiser, 1st. Time, 5m. 11s. Special event—Barney Oldfield against the world's record, circular track. Time, 56 4-5s. Five-mile invitation race—Earl Kiser, 1st. Charles Meyers, 2nd. Time, 5m. 35s. Five miles, open—Webb Jay, 1st. Louis Chevrolet, 2nd. Time, 4m. 46 2-5s. Ten miles, club championship race between New York, Chicago and St. Paul—Earl Kiser (St. Paul), 1st. Webb Jay (Chicago), 2nd. Time, 10m. 33s.

Track Races—St. Paul (Continued)

July 10.—Two-mile novelty race for women with escorts, women driving—Mrs. F. Josewick, 1st. Mrs. C. A. Fawkes, 2nd. Time, 3m. 24 1-5s. Three-mile invitation race for Minnesota cars—Charles Joy, 1st. J. Simpson, 2d. Time, 4m. 13 3-5s. Five miles, final heat, manufacturers' and dealers' race—Charles Joy, 1st. Harry Pence, 2nd. Time, 4m. 7s. Three miles, final heat, cars under 1,432 pounds—C. A. Coey, 1st. Harry Pence, 2nd. Time, 3m. 36s. Three-mile handicap race for equipped cars—C. H. Burnham, 1st. J. K. McCollough, 2nd. Time, 5m. 9s. Five-mile invitation race—Earl Kiser, 1st. Victor Stromquist, 2nd. Time, 5m. 22 1-5s. Five-mile open handicap for stripped cars—A. D. Huffman, 1st. Victor Stromquist, 2nd. Time, 7m. Five-mile open race—Earl Kiser, 1st. Barney Oldfield, 2nd. Time, 4m. 51s. One-mile dash, flying start, special event—Barney Oldfield, 1st. Time, 55s. Earl Kiser, 2nd. Time, 56 4-5s.

ROAD RACES

NEW YORK, N. Y.

Coney Island Boulevard (Brooklyn), one mile trials promoted by the Long Island Automobile Club, Nov. 16, 1901.—Summaries: Gasolene vehicles under 1,000 pounds. Jacquez Longuez (10-hp. De Dion), time, 1m. 27 3-5s. Gasolene vehicles between 1,000 and 2,000 pounds—Percy Owen (12-hp. Winton), time, 1m. 53 3-5s. C. I. Stralem (7-hp. Panhard), time, 1m. 57 2-5s. Gasolene vehicles over 2,000 pounds—Henry Fournier (40-hp. Mors), time, 51 4-5s. Foxhall P. Keene (40-hp. Mors), time, 54 2-5s. Albert C. Bostwick (40-hp. Winton), time, 56 2-5s. Louis Charley (35-hp. Daimler), time, 1m. 8s. J. Wesley Blair (16-hp. Panhard), time, 1m. 43s. Steam vehicles—S. T. Davis, Jr. (8-hp. Locomobile), time, 1m. 15s. T. D. De Witt (4½-hp. Locomobile), time, 1m. 33 1-5s. B. L. Wright (5-hp. Grout), time, 1m. 56 4-5s. W. J. Stewart (3½-hp. Locomobile), time, 1m. 57 1-5s. Electric vehicles—A. L. Riker (Riker), time, 1m. 3s.

Merrick Road, Long Island, 50-mile race, Springfield to Babylon and return, promoted by Automobile Club of America, April 14, 1900.—Summaries: 1. A. L. Riker (5-hp. Electric), time 2h. 3m. 30s. 2. S. T. Davis, Jr. (4½-hp. Steam), time, 2h. 18m. 27s. 3. A. Fisher (5-hp. Gasolene), time, 2h. 30m. 1s. 4. D. Wolfe Bishop, Jr. (6-hp. Gasolene), time, 2h. 37m. 52s. 5. A. C. Bostwick (6-hp. Gasolene), time, 2h. 46m. 40s. 6. G. F.

Chamberlin (6-hp. Gasolene), time, 2h. 48m. 42s.

1. S. T. Davis, Jr. (4½-hp. steam), time, 58m. 15s. 2. A. L. Riker (5-hp. Electricity), time, 1h. 38s. 3. A. Fischer (5-hp. Gasolene), time, 1h. 6m. 44s. 4. D. Wolfe Bishop, Jr. (6-hp. Gasolene), time, 1h. 13m. 10s. 5. G. F. Chamberlin (6-hp. Gasolene), time, 1h. 17m. 3s. 6. A. C. Bostwick (6-hp. Gasolene), 1h. 18m. 58s.

Three contestants failed to reach Babylon, viz., Dave H. Morris, 5-hp. steamer; W. H. Hall, in a similar car, and C. J. Field, in a 3-hp. voiturette. C. H. Tangeman, with a gasolene tricycle, kept company on the outward journey with Mr. Riker, and then beat him home by five minutes.

South Shore Boulevard (Staten Island), mile and kilometer trials promoted by Automobile Club of America, May 30, 1902.—Summaries: Motor bicycles—C. H. Metz (3½-hp. Orient), 1st. Time for km., 43 3-5s. Time for mile, 1m. 10 2-5s. Gasolene under 1,000 pounds—L. S. Thompson (5-hp. Renault), 1st. Time for km., 59s. Time for mile, 1m. 35 3-5s. Lewis Nixon (7-hp. Long Distance), 1st. Time for km., 1m. 3s. Time for mile, 1m. 43 3-5s. H. Ward Leonard (8-hp. Knickerbocker), 1st. Time for km. 1m. 53-5s. Time for mile, 1m. 45s. Gasolene, 1,000 to 2,000 pounds—Percy Owen (15-hp. Winton), 1st. Time for km. 47s. Time, for mile, 1m. 17 3-5s. Ernest Cueno (16-hp. Rochet-Schneider), 2nd. Time for km.,

Road Races—New York (Continued)

56 3-5s. Time for mile, 1m. 22 4-5s. Gasolene, over 2,000 pounds—E. E. Britton and A. J. Levy (60-hp. Mors), 1st. Time, for km., 34 4-5s. Time for mile, 55 1-5s. William Guggenheimer (24-hp. Panhard), 2nd. Time for km., 44s. Time for mile, 1m. 11s. Steam—S. T. Davis, Jr. (10-hp. Locomobile), 1st. Time for km., 46 1-5s. Time for mile, 1m. 12s. H. M. Wells (4½-hp. Prescott), 2nd. Time for km., 1m. 1 1-5s. Time for mile, 1m. 37 1-5s.

VANDERBILT CUP.

Vanderbilt Cup race, designed to be an annual speed contest on the road, open to teams of not more than 10 cars from each country, for a trophy donated by W. K. Vanderbilt, Jr. Was first run in 1904, and annually thereafter, except in 1907.

Early in 1904 Mr. Vanderbilt announced his intention of offering a trophy to be contested for on an international basis, no country to be represented by more than 10 cars. It was provided in the deed of gift that the first and second races should be run in the United States and that thereafter the race "may be held in any country holding the cup." A commission to take over the management of the race was provided for, consisting, during 1904 and 1905, of the racing board of the American Automobile Association, the donor of the cup and one member of the sports committee, of the Automobile Club of France; and, subsequently to 1905, of the sports committee of the Automobile Club of France, the donor and one member of the racing board of the A. A. A. It was also provided that the competition should not be less than 250 nor more than 300 miles, and must be held on a recognized regular highway or an automobile speedway; and that no car should be allowed to compete the weight of which exceeds 2,204 pounds or is less than 881 pounds.

The first race was run Oct. 8, 1904. A course on Long Island, termed the Hicksville-Hempstead-Jericho circuit, measuring 30.24 miles, or 28.44 miles excluding controls, was covered ten times, making a total distance of 284.4 miles. George Heath, an American, driving a 90-hp. Panhard, won, his time being 5h. 26m. 45s. Albert Clement (90-hp. Clement), was second in 5h. 28m. 13s.

Eighteen cars started in the race, which began at 6 o'clock in the morning. Of these six were of French make, five German, two Italian and five American. Only two cars completed the full distance, the race being stopped after

Road Races—Vanderbilt (Continued)

Clement had finished, owing to the fact that the immense crowd, estimated at more than 100,000, swarmed on the course and rendered further running dangerous. Six other cars were still running at the time.

The complete summary follows: 1st, Heath, (90-hp. Panhard), 5h. 26m. 45s.; 2nd, Clement, (90-hp. Clement), 5h. 28m. 13s.; 3d, Lyttle, (24-hp. Pope-Toledo), 9 laps; 4th, Schmidt, (24-hp. Packard), 8 laps; 5th, Campbell, (60-hp. Mercedes), 8 laps; 6th, Tarte, (90-hp. Panhard), 7 laps; 7th, Luttgen, (60-hp. Mercedes), 7 laps; 8th, Croker, (75-hp. Simplex), 6 laps. The race was managed by the racing board of the American Automobile Association, of which A. R. Pardington was chairman.

In 1905 entries were received from 13 American cars, and this necessitated the running of elimination trials. This preliminary contest was held on Sept. 23, on the regular course for that year. Instead of going the full ten laps, however, the contesting cars covered only four, making a distance of 113.2 miles, thus shortening the time of the race in deference to public sentiment against too frequent closing of the roads.

The start was made at 5:30 A. M. and five cars finished, as follows: 1st, B. H. Dingley (50-hp. Pope-Toledo), 2h. 50s.; 2d, Jos. Tracy (90-hp. Locomobile), 2h. 1m. 49s.; 3rd, Robert Jardine (40-hp. Royal), 2h. 19m. 18s.; 4th, Frank Nutt (40-hp. Haynes), 2h. 23m. 32s.; 5th, M. Roberts (60-hp. Thomas), 2h. 29m. 40s. Geo. Robertson (80-hp. Christie), stopped on third round; H. H. Lyttle (75-hp. Pope-Toledo), stopped on second round; Walter C. White (40-hp. White), stopped on second round. The cup commission, instead of naming the five cars which finished as the American team, availed itself of its privilege to disregard the results of the trial contest and threw out three of the five cars, the Haynes, the Royal and the Thomas, and substituted the Christie, the White and the Lyttle Pope-Toledo in their places.

On Saturday, Oct. 14, the second Vanderbilt race was run, there being 19 starters. France, America and Italy were represented by five cars each and Germany by four. A course slightly different from that of the previous year, but still on Long Island, had been selected, measuring exactly 28.3 miles, without controls, which was covered ten times. The starting point was near Mineola on the Jericho turnpike, the cars heading due east for Jericho, thence to East Norwich, to Bull's Head, to Albertson, to Hyde Park and into the Jericho turnpike again.

Road Races—Vanderbilt (Continued)

Lancia, (Italy), took the lead at the start and steadily increased it until the eighth lap when, having put in at his station near Lakeville to repair a tire, being 20 minutes ahead of Heath, (France), who was second, he started out in front of Christie, another competitor, and the latter crashed into him before he got fairly underway. The collision bent the axle of Lancia's car and thirty minutes was consumed in straightening it sufficiently to permit the Italian driver to proceed. It was then too late to catch up and Lancia finished in fourth place. Meanwhile Hemery (80-hp. Darracq), wrested the lead from Heath on the 8th lap and never thereafter lost it. He finished first, his time being 4h. 36m. 8s., an average of 61.51 miles per hour. Heath was second, in 4h. 39m. 40s. Joseph Tracy (90-hp. Locomobile), was third in 4h. 58m. 26s., and Lancia fourth, his time being 5h. 31s. These four were the only cars to finish, the crowd swarming on the course and rendering it necessary to call off the race.

Ideal weather conditions prevailed and brought out a crowd that was variously estimated from 100,000 to 200,000. As in 1904, the contest was in charge of the racing board of the American Automobile Association, Robert Lee Morrell being chairman.

The entry of fifteen American cars in 1906 again necessitated the running of a preliminary or elimination test. This was held on the regular Vanderbilt cup course for this year on Saturday, Sept. 22, and resulted in the selection of the following team to represent America: Joseph Tracy (100-hp. Locomobile), Herbert LeBlon (115-hp. Thomas), H. N. Harding (50-hp. Haynes), Frank Lawell (110-hp. Frayer-Miller), and Walter Christie (50-hp. Christie). Only the first three covered the full course, and Lawell and Christie were given places on the team; the former owing to the fact that he was still running when the race was called off, and the latter owing to the disqualification of Lyttle (Pope-Toledo), for being towed. Tracy's time was 5h. 27m. 45s., for the 297.1 miles.

Just two weeks later the race itself, being the third contest for the Vander-

Road Races—Vanderbilt (Continued)

bilt cup, was run. France won for the third successive time, the victorious driver being Louis Wagner, who, in a 100-hp. Darracq, covered the 297.1 miles in 4h. 50m. 10s. 2-5s., just 3m. 29s. faster than Lancia (Fiat), who finished second. Third place was won by Duray (130-hp. De Dietrich), who was only 6s. behind Lancia. Following was the order of finish: 1st, Wagner (Darracq), time, 4h. 50m. 10s.; 2nd, Lancia (Fiat), 4h. 53m. 28s.; 3rd, Duray (De Dietrich), 4h. 53m. 44s.; 4th, Clement (Clement), 5h. 1m. 59.4-5s.; 5th, Jenatzy (Mercedes), 5h. 4m. 38s.

Under the provisions of the deed of gift the 1906 race could have been run in France, that country being the holder of the cup, through Hemery's victory in 1905. The Automobile Club of France declined to promote a race, however, or even to nominate a team to represent it in the 1906 race. Consequently the race was again run in America, and the French representation was unofficial.

Owing to the crowding of the spectators on the course in the 1906 race, and the failure of the effort to obtain the use of militia for patrolling purposes, it was deemed impracticable to conduct another contest on the public highways. A project to build a motor parkway on Long Island was set on foot and it was expected that this new speedway would be ready in time for the 1907 Vanderbilt race. It proved to be impossible to do so, however, and in the summer the A. A. formally declared that no race would be held during 1907. Including the wooden base, the Vanderbilt cup stands about 31 inches. The bowl contains 481 ounces of sterling silver and has a capacity of over 10½ gallons. A portrait of the donor in his 90-hp. Mercedes at Ormond Beach is worked up in bold relief on the front of the bowl, while on the back appears this inscription: "Challenge cup presented by W. K. Vanderbilt, Jr., to the American Automobile Association, under deed of gift, to be raced for yearly by cars under 1,000 kilos. Won by.....". Around the top of the cup is shown in relief a bold, richly carved laurel wreath, symbolizing success.

BEACH RACES

ATLANTIC CITY, N. J.

Ventnor Course, Sept. 4 and 5, 1905—Summaries:

Sept. 4.—One mile, for light weight cars, 551 to 851 pounds, from a moving start—E. Walter Harper (10-hp. Stanley), 1st. Mrs. Jean Cuneo (White), 2nd.

Time, 1m. 13.2-5s. One mile, for touring cars, owner and three passengers, from a standing start—Charles Swain (Winton), 1st. John T. Wilkins, Jr. (Winton), 2nd. Time, 1m. 27s. One mile, for heavyweight cars, from 1,432 to 2,204 pounds—Charles Bacharach

Beach Races—Atlantic City (Continued)

(Packard), 1st. Edward Wilkie (Buick), 2nd. Time, 1m. 15 1-5s. One mile, 20-hp. or over, owned by resident of Atlantic City, and driven by owner or chauffeur—J. Miers (Welch), 1st. G. H. Jones (Corbin), 2nd. Time, 1m. 25s. One mile, time guess, open to all, car to carry driver and three passengers—J. Everett Mohrer (Thomas), 1st. J. N. Wilkins, Jr. (Winton), 2nd. Time, 3m. 2-5s.

Sept. 5.—One mile, for touring cars, costing \$2,500 or under, to carry driver and three passengers—Charles Myers (Upton), 1st. John Donnelly (National), 2nd. Time, 1m. 48 2-5s. One mile, for American made cars of 38-hp. or under—Charles Bacharach (Packard), 1st. James Duff (Pope-Toledo), 2nd. Time, 1m. 21 1-5s. One mile, free-for-all—Frank Kulick (Ford), 1st. A. L. Campbell (Darracq), 2nd. Time, 40 1-5s. Afterward declared off because Kulick started ahead of Campbell. One mile, for touring cars costing \$2,500 or over, to carry driver and three passengers—Charles Swain (Winton), 1st. Charles Bacharach (Packard), 2nd. Time, 1m. 15 2-5s. One mile, for middleweight cars, 851 to 1,432 pounds—Walter Harper (Stanley), 1st. Edward Wilkie (Buick), 2nd. Time, 1m. 17 1-5s. One mile, for heavyweight cars, 1,432 to 2,204 pounds—Edward Wilkie (Buick), 1st. Charles Swain (Winton), 2nd. Time, 1m. 11 4-5s. One mile, for touring cars, to kilometer station, pick up three passengers—Charles Swain (Winton), 1st. John N. Wilkins, Jr. (Winton), 2nd. Time, 1m. 46 2-5s. One mile, free-for-all, stripped cars—A. L. Campbell (Darracq), 1st. F. Kulick (Ford), 2nd. Time, 43 seconds. This event run because the first trial was called off. One mile, for heavyweight stripped cars—F. Kulick (Ford), 1st. A. L. Campbell (Darracq), 2nd. Time, 42 3-5s.

Ventnor Beach, April 26, 27 and 28, 1906.—Summaries:

April 26.—Record trials, steam—H. E. Rogers (20-hp. Stanley), 1st. Time, 42 3-5s. Four-cylinder cars, championship—W. H. Hilliard (80-hp. Napier), 1st. Montague Roberts (50-hp. Thomas), 2nd. Time, 46 2-5s. John H. Lyons Cup, American touring cars of 30-hp., owners to drive, five passengers—P. F. Rockett (30-hp. Stoddard-Dayton), 1st. F. S. Walton (30-hp. Stoddard-Dayton), 2nd. Time, 1m. 17 3-5s. Standing start championship, gasoline cars—Walter Christie (110-hp. Christie), 1st. W. H. Hilliard (80-hp. Napier), 2nd. Time, 53s., creating new American record.

Beach Races—Atlantic City (Continued)

Touring cars, gasoline, selling at \$4,000 or less, five passengers—Charles Soules (35-hp. Pope-Toledo), 1st. Montague Roberts (50-hp. Thomas), 2nd. Time, 1m. 13 2-5s. Special class, for stripped touring cars, 50-hp. or less—Montague Roberts (50-hp. Thomas), 1st. E. B. Jackson (40-hp. Chadwick), 2nd. Time, 1m. 2s. Price handicap, four-cylinder cars, five passengers, \$4,000 car on scratch, handicap of one second for each \$100 less in price—F. S. Walton (50-hp. Stoddard-Dayton), 1st. P. F. Rockett (20-hp. Stoddard-Dayton), 1st., 2nd. Time, 1m. 25s. Time trials, special against the minute mark—Montague Roberts (50-hp. Thomas). Time, 56 4-5s.

April 27.—Record trials, gasoline cars, 881 to 1,432 pounds—Mrs. J. Newton Cuneo (10-hp. Maxwell), 1st. Time, 1m. 25 3-5s. Mrs. H. Ernest Rogers (10-hp. Maxwell), 2nd. Time, 1m. 31s. Middleweight gasoline cars, 881 to 1,432 pounds—R. L. Lockwood (30-hp. Reo Bird), 1st. Time, 1m. 2-5s. Mrs. Joan Cuneo (10-hp. Maxwell), 2nd. Time, 1m. 36 3-5s. Touring car championship, open to all touring cars of 50-hp. or less, regular equipment, carrying five passengers—J. E. Bristol (45-hp. Pierce), 1st. Time, 1m. 7 2-5s. W. C. Thomas (50-hp. Thomas), 2nd. Price handicap for two-cylinder touring cars, regular equipment, carrying five passengers, \$1,500 car on scratch, handicap of one second for \$500 less in price—H. J. Koehler (Buick), 5s., 1st. Time, 2m. 6 1-5s. W. Haupt (Buick), 5s., 2nd. Time, 2m. 8 1-5s. Heavyweight gasoline cars, 1,432 to 2,204 pounds—Walter Christie (Christie), 1st. Time, 46 4-5s. Guy Vaughn (Darracq), 2nd. High gear test, quarter mile, prize going to car which covered distance slowest on high speed, driver and an official to act as watcher of clutch and gears, to ride on each car, regular equipment, open to gasoline cars, a stop disqualifying—J. N. Wilkins, Jr. (20-hp. Winton), 1st. D. Landau (30-hp. Acme), stopped and was disqualified. Gasoline runabouts, selling at \$1,000 or less, made to carry two passengers, regular equipment, with full complement of passengers—H. J. Koehler (22-hp. Buick), 1st. Time, 1m. 15 3-5s. W. Haupt (22-hp. Buick), 2nd.

April 28.—Record trials, gasoline cars, 1,432 to 2,204 pounds—Walter Christie (110-hp. Christie), 1st. Time, 35 1-5s. Guy Vaughn (80-hp. Darracq), 2nd. Time, 39s. Chauffeurs' handicap—E. C. Johnson (18-hp. White), 40s., 1st. Roberts (60-hp. Thomas), 1st., 2nd. Time, 1m. 25s. Free-for-all championship, flying start, cup to be won twice for

Beach Races—Atlantic City (Continued)

permanent ownership—Guy Vaughn (80-hp. Darracq), 1st. William Wallace (80-hp. Darracq), 2nd. Time, 47 3-5s. Touring cars selling at \$3,000 or less, regular equipment and carrying five passengers—P. T. Rockett (30-hp. Stoddard-Dayton), 1st. H. P. Bellow (24-hp. Columbia), 2nd. Time, 1m. 22 1-5s. Foreign car race, open to all foreign touring cars of 50-hp. or less, regular equipment, carrying five passengers—H. N. Harding (35-hp. English Daimler), 1st. Walter E. Edge (30-hp. Darracq), 2nd. Time, 1m. 14 4-5s. One minute class handicap, open to cars that established mark of one minute or better on beach—H. R. Robinson (50-hp. Thomas), 5s., 1st. Time, 1m. 13 1-5s. Montague Roberts (60-hp. Thomas), scratch, 2nd. Time, 1m. 13 2-5s.

Ventnor Beach, Sept. 3, 4 and 5, 1906. —Summaries:

Sept. 3.—Record trial, steam—D. Walter Harper (20-hp. Stanley), 1st. Time, 51 2-5s. Record trial, gasoline, heavy-weight, 1,432 to 2,204 pounds—Campbell (80-hp. Darracq), 1st. Time, 39 3-5s. Wallace (80-hp. Darracq), 2nd. Time, 40 3-5s. Record trial, gasoline, middle weight, 631 to 1,432 pounds—Cedrina (14-hp. Fiat), 1st. Time, 51 4-5s. Touring cars, gasoline, selling at \$3,000 or less, regular equipment to carry five passengers—C. W. Kelsey (35-hp. Maxwell), 1st. Time, 1m. 30 3-5s. H. R. Sack (30-hp. Mitchell), 2nd. Mitchell car protested for not being regularly equipped. Touring car championship, open to all touring cars of 60-hp. or less, regular equipment, to carry five passengers, Bureau of Information Cup, to be won twice for permanent possession, first and second cars in trial heats to qualify for finals—Harding (45-hp. English Daimler), 1st. Time, 1m. 8 4-5s. Ernest Kelly (50-hp. Thomas), 2nd. Free-for-all championship, flying start, best two in three heats, Atlantic City Cup, to be won twice for permanent possession—Stevens (Darracq), 1st. Time, 45 2-5s. Schroeder (Darracq), 2nd. Price handicap four-cylinder touring cars, regular equipment to carry five passengers, \$4,000 cars on scratch, handicap of 1s. for each \$200 less in price—Ernest Kelly (50-hp. Thomas), scratch, 1st. Time, 1m. 21 3-5s. W. T. Smith (50-hp. Thomas), scratch, 2nd. Foreign car events, open to all imported touring cars of 50-hp. or less—Harding (45-hp. English Daimler), 1st. Time, 1m. 10 4-5s. Cedrina (35-hp. Fiat), 2nd. Runabouts, gasoline, selling at \$1,000 or less, to carry two passengers, regular equipment

Beach Races—Atlantic City (Continued)

—E. Wilkie (22-hp. Buick), 1st. Time, 1m. 34 4-5s. W. M. Davis (10-hp. Maxwell), 2nd. Winner protested for not being regularly entered.

Sept. 4.—Touring cars selling at \$5,000 or less—E. R. Kelly (50-hp. Thomas), 1st. Ernest Lash (24-hp. Packard), 2nd. Time, 1m. 14 3-5s. Standing start for gasoline cars—C. A. Schroeder (80-hp. Darracq), 1st. S. B. Stevens (30-hp. Darracq), 2nd. Time, 58 1-5s. Touring cars selling at \$1,500 or less—D. Walter Harper (10-hp. Stanley), 1st. Eddie Wilkie (18-hp. Buick), 2nd. Time, 1m. 42s. John H. Lyon's Cup for American touring cars of 30-hp. or less—Ernest Lash (24-hp. Packard), 1st. Samuel Moore (30-hp. Franklin), 2nd. Time, 1m. 15 4-5s. Four-cylinder cars, open—S. B. Stevens (80-hp. Darracq), 1st. C. A. Schroeder (80-hp. Darracq), 2nd. Time, 50s. Special race—A. Codman (60-hp. Napier), 1st. Hol-Tan Co. (35-hp. Fiat), did not finish. Special steam car event—Merrill Dobbins (10-hp. Stanley), 1st. J. T. Moriarity (10-hp. Stanley), 2nd. Time, 1m. 25 1-5s. Match race—Cooper (50-hp. Matheson), 1st. Harding (45-hp. English Daimler), 2nd. Time, 58 1-5s. Time trials—Pierce Arrow, 1st. Time, 1m. 9 2-5s. Stanley, 2nd. Time, 1m. 7s.

Sept. 5.—Record trials, steam—Howard W. Gills (20-hp. Stanley), 1st. Time, 55 2-5s. D. Walter Harper (20-hp. Stanley), 2nd. Time, 56 2-5s. Record trials, gasoline cars, 1,432 to 2,204 pounds—Campbell (Darracq), 1st. Time, 37 4-5s. Schroeder (Darracq), 2nd. Time, 38 1-5s. Special record trial—Cooper (Matheson), 1st. Time, 38 1-5s. Special record trial—Harding (English Daimler), 1st. Time, 55 1-5s. Runabouts, all types, handicap open to all runabouts regularly cataloged and equipped for two passengers—John W. Wilkins (40-hp. Winton), 25s., 1st. Time, 1m. 35 3-5s. Matheson Co. (50-hp. Matheson), scratch, 2nd. Heavyweight gasoline cars, 1,432 to 2,204 pounds—Campbell (80-hp. Darracq), 1st. Time, 49 3-5s. Wallace (80-hp. Darracq), 2nd.

Ventnor Beach, Aug. 5, 6, 7, 1907.— Summaries:

August 5.—Touring cars, \$3,000 or less, regularly equipped, carrying five passengers—T. W. Berger (35-hp. Oldsmobile), 1st. C. W. Hoffman (30-hp. Pope-Hartford), 2nd. Time, 1m. 15s. Runabouts, \$1,200 or less—Charles Fleming (14-hp. Maxwell), 1st. Thomas Wilkie (22-hp. Buick), 2nd. Time, 1m. 32 4-5s. Touring car championship—F. H. Hancock (50-hp. Stevens-Duryea), 1st. 50-hp. Matheson, 2nd. Time, 66 3-5s. Run-

Beach Races—Atlantic City (Continued)

abouts, all types, regularly equipped—Frank Leland (60-hp. 6-cylinder Stearns), 1st. Guy Vaughn (30-hp. Stearns), 2nd. Time, 52s. Touring cars, \$5,000 or less, regularly equipped—Guy Vaughn (30-hp. Stearns), 1st. William Coyle (30-hp. Stearns), 2nd. Time, 61 1-5s. Steam cars—D. W. Harper (25-hp. Stanley), 1st. Time, 53 2-5s. Touring cars, \$3,000 or less, regularly equipped—T. W. Berger (35-hp. Oldsmobile), 1st. E. L. Leinbach (30-hp. Stoddard-Dayton), 2nd. Time, 1m. 15s. Foreign cars, 60-hp. or less—Harry Levey (60-hp. Mercedes), 1st. L. R. Burnes (Rolls-Royce), 2nd. Time, 1m. 15 3-5s. Match race—Guy Vaughn (60-hp. Stearns), 1st. C. L. Lawrence (30-hp. B. L. M.), 2nd. Time, 57 3-5s.

Aug. 6.—Touring cars, \$1,500 or less, regularly equipped—W. J. Hayes (20-hp. Jackson), 1st. Edward Wilkie (22-hp. Buick), 2nd. Time, 1m. 26 3-5s. Prize handicap, regularly equipped touring cars, carrying five passengers, handicap 1s. for each \$200 less in price—T. W. Berger (35-hp. Oldsmobile), scratch, 1st. E. L. Linebach (30-hp. Stoddard-Dayton), 1s., 2nd. Time, 1m. 32s. Free-for-all championship—Montague Roberts (120-hp. Thomas), 1st. Time, 40 2-5s. F. W. Leland (45-hp. 6-cylinder Stearns), 2nd. Time, 41 4-5s. John N. Lyon's cup, open to American touring cars of 30-hp. and less, regularly equipped, carrying five passengers, owners to drive—T. W. Berger (30-hp. Oldsmobile), 1st. P. F. Rockett (30-hp. Stoddard-Dayton), 2nd. Time, 1m. 14 1-5s. Gentlemen's roadster handicap, cars selling from \$2,500 to \$5,000, owners to drive—William McIlvird (40-hp. Thomas), 1st. E. L. Linebach (30-hp. Stoddard-Dayton), 9s., 2nd. Time, 1m. 11 3-5s. 1:10 class handicap, open to all cars which had made a record of 1:10 or better on the beach—Guy Vaughn (30-hp. Stearns), 7s., 1st. D. W. Harper (Stanley), 4s., 2nd. Time, 67 2-5s. Time trial for stripped touring car record—F. W. Leland (45-hp. Stearns 6-cylinder), 1st. Time, one mile in 44s. Time trial—R. Crawford (50-hp. Crawford). Time, 63 3-5s., the best record for the beach being 34s., by Walter Christie (Christie).

Aug. 7.—Stripped cars, open to all cars of American manufacture—M. Roberts (120-hp. Thomas), 1st. J. B. Ryall (90-hp. Matheson), 2nd. Time, 50 1-5s. Match race for Stoddard-Dayton cars—Newton, 1st. Edwards, 2nd. Match race—W. McIlvird (40-hp. Thomas), 1st. J. Scanley (1902 Mercedes), 2nd. Time, 1m. 11 1-5s. Match race—Stewart Elliott

Beach Races—Atlantic City (Continued)

(30-hp. Packard), 1st. R. G. Kelsey (50-hp. Matheson), 2nd. Time, 1m. 9 1-5s. Roadsters class, owners to drive—Guy Vaughn (30-hp. Stearns), 1st. D. W. Harper (Stanley), 2nd. Time, 57 4-5s. Stock cars, fully equipped, carrying four passengers.—Dead heat between Guy Vaughn and J. Gunther, both in steam cars.—J. W. Beyer (30-hp. Oldsmobile), 2nd. Time, 1m. 52-5s. Motorcycle race—W. H. Wray, Jr. (8-hp. Simplex Peugeot), 1st. Fred. Borden (5-hp. Curtis), 2nd. Time, 51 4-5s. Handicap, owners to drive—Guy Vaughn (30-hp. Stearns), scratch, 1st. R. G. Kelsey (50-hp. Matheson), 12s., 2nd. Time, 1m. 22s. Match race—Frank Potts (60-hp. Thomas), 1st. Stewart Elliott (30-hp. Packard), 2nd. Time, 1m. 9 1-5s. Time trials—Montague Roberts (120-hp. Thomas), 1st. Time, 39 1-5s. A. J. Moulton (85-hp. B. L. M.), 2nd. Time, 44 4-5s.

CAPE MAY, N. J.

July 29, 1905.—Summaries: Touring cars, up to 20-hp., to be driven by owners—W. C. Longstreth (16-hp. Maxwell), 1st. C. J. Swain (16-20-hp. Winton), 2nd. Time, 1m. 50 4-5s. Touring cars, up to 30-hp., to be driven by owners—G. B. Fletcher (28-hp. Packard), 1st. Time, 1m. 20 1-5s. Walter Dubree (24-30-hp. National), 2nd. Time, 1m. 26s. Touring cars, up to 40-hp., to be driven by owners—C. J. Swain (40-hp. Winton), 1st. Time, 1m. 17 1-5s. J. A. Depew (40-hp. Winton), 2nd. Time, 1m. 22s. Touring cars, up to 20-hp., driven by owner or chauffeur—T. E. Swayne (16-20-hp. Elmore), 1st. Time, 1m. 35 2-5s. C. J. Swain (16-20-hp. Winton), 2nd. Time, 1m. 42s. Touring cars, up to 30-hp., driven by owner or chauffeur—Walter Dubree (24-30-hp. National), 1st. G. B. Fletcher (28-hp. Packard), 2nd. Time, 1m. 37 4-5s. Touring cars, up to 40-hp., driven by owner or chauffeur—C. J. Swain (40-hp. Winton), 1st. J. A. Depew (40-hp. Winton), 2nd. Time, 1m. 22 4-5s. Touring cars, up to 10-hp., driven by owner or chauffeur—H. A. Wilson (10-hp. Cadillac), 1st. C. C. Martin (10-hp. Cadillac), 2nd. Time, 2m. 3s. One-mile special exhibitions—Walter Christie (120-hp. Christie). Time of first trial, 45 4-5s. Second trial, 42 2-5s. Third trial, 38 2-5s. Special event for 40-hp. Wintons—C. J. Swain, 1st. Time, 1m. 23 1-5s. Special event for 10-hp. Cadillacs—C. C. Martin, 1st. Time, 2m. 5 1-5s. Special event for 16-hp. Maxwells—W. C. Longstreth, 1st. Time, 2m. 4 2-5s.

Beach Races—Cape May (Continued)

Aug. 25 and 26, 1905.—Summaries:

Aug. 25.—Middleweight cars from a moving start—Cedrina (Fiat), 1st. C. W. Kelsey (Maxwell), 2nd. Time, 39 1-5s. Gasolene touring cars, up to 30-hp., driven by owners—Mrs. C. C. Fidler (Packard), 1st. Charles Bacharach (Packard), 2nd. Time, 56s. Touring cars, up to 20-hp., driven by owners or chauffeurs from a moving start—Sweeney (Pope-Toledo), 1st. C. W. Kelsey (Maxwell), 2nd. Time, 58s. Gasolene touring cars, up to 40-hp., driven by owners from a moving start—J. A. Thropp (Winton), 1st. Event for touring cars up to 40-hp., varying, driver and three persons, from a moving start—J. A. Depew (Winton), 1st. J. A. Thropp (Winton), 2nd. Time, 51 1-5s. Touring cars, up to 50-hp., from a standing start—J. A. Thropp (Winton), 1st. C. J. Swain (Winton), 2nd. Time, 59s. Two trials were made by Walter Christie (12-hp. Christie) to break the kilometer record, which he holds, of 25 seconds flat. Time, 26 4-5s. and 26 1-5s. Campbell also made two trials at the record. Time, 25 4-5s. and 25 1-5s.

Aug. 26.—Mile event, for middleweight cars, from a moving start—Henry Ford (Ford), 1st. Time, 51 3-5s. Mile event, for gasolene touring cars—Mrs. C. C. Fidler (Packard), 1st. George Jones (Jones-Corbin), 2nd. Time, 1m. 15 3-5s. Mile event, up to 50-hp.—J. N. Wilkins, Jr. (Winton), 1st. J. H. Thropp (Winton), 2nd. Time, 1m. 31s. Mile event, for gasolene touring cars, driven by owner from a moving start—J. N. Wilkins, Jr. (Winton), 1st. J. H. Thropp (Winton), 2nd. Time, 1m. 16s. Mile event, for touring cars up to 40-hp., to carry driver and three passengers, to be driven by owner or chauffeur from a moving start—C. J. Swain (Winton), 1st. J. N. Wilkins, Jr. (Winton), 2nd. Time, 1m. 13s. Mile special event, for gasolene car, flying start, against time, for the \$1,000 Cape May trophy—A. L. Campbell (Darracq), 1st. Time, 38s. Mile event, for heavyweight cars, 1,432 to 2,204 pounds, standing start—Louis Chevrolet (Fiat), 1st. A. L. Campbell (Darracq), 2nd. Time, 51 4-5s. \$500 Cape May Automobile Club kilometer trophy—Walter Christie (130-hp. Christie), 1st. Time, 24 2-5s. and 23 2-5s. Henry Ford (60-hp. Ford), 2nd. Time, 25s. Christie's former record for the kilometer was 25s. Kilometer event, from a standing start—Campbell (Darracq). Time, 43s. flat. Time trials, \$1,000 club trophy—Campbell (Darracq), 1st. Time, 38s. Walter Christie (Christie), 2nd. Time, 39 1-5s.

NEWPORT, R. I.

Sachusett Beach 1½-mile course, July 31, 1904.—Summaries: Motorcycle event, any power—Oscar Hedstrom (1¼-hp. Indian), 1st. J. McNevin (1¼-hp. Rambler), 2nd. Time, 1m. 27s. Local, gasolene cars exceeding 10-hp., not exceeding 24-hp.—H. Hamlin (24-hp. Panhard), 1st. J. J. Astor (20-hp. Mercedes), 2nd. Time, 1m. 35¼s. Gasolene cars not exceeding 10-hp., road condition—P. F. Conroy (7-hp. Stevens-Duryea), 1st. P. Jones (10-hp. Renault), 2nd. Time, 56 3-5s. Local, electrics—H. Bull, Jr. (3-hp. Waverley), 1st. H. Oelrichs, Jr. (3-hp. Waverley), 2nd. Time, 3m. 32¼s. Class 5, open, gasolene cars not exceeding 24-hp.—A. E. Morrison (24-hp. Peerless), 1st. H. Hamlin (24-hp. Panhard), 2nd. Time, 1m. 27s. Open, gasolene cars exceeding 24-hp.—E. R. Thomas (60-hp. Mercedes), 1st. H. S. Harkness (60-hp. Mercedes), 2nd.

Sachusett Beach, Aug. 6, 1906.—Summaries: Motor cycle race—S. T. Kellogg, 1st. W. T. Bowler, 2nd. Time, 1m. 15 2-5s. Gasolene cars not over 15-hp.—E. L. Baron (10-hp. Ford), 1st. C. B. Nordhoff (10-hp. Maxwell), 2nd. Time, 1m. 48 2-5s. Invitation race—John E. Pugh (28-hp. Queen), 1st. Calvin D. Snow (20-hp. Stevens-Duryea), 2nd. Time, 1m. 20 3-5s. Stanley steamers, catalog equipment, touring cars—B. F. Blackinton (20-hp. car), 1st. L. F. N. Baldwin (20-hp. car), 2nd. Time, 1m. 10 4-5s. Stanley steamers, catalog equipment—N. M. Laporte (10-hp. car), 1st. W. W. Little (10-hp. car), 2nd. Time, 1m. 19 1-5s. Exhibition mile—Robert Goelet (24-hp. Renault). Time, 1m. 42 3-5s. Exhibition mile—S. T. Kellogg (motorcycle). Time, 1m. 12s. Exhibition mile—L. F. N. Baldwin (20-hp. Stanley). Time, 53s.

ORMOND-DAYTONA, FLA.

Ormond-Daytona beach races, held on the beach between these two Florida towns. The first regular contests occurred March 26, 27 and 28, 1903, when W. J. Morgan promoted a meeting there. The only notable performance was that of Alexander Winton, who, driving the Winton Bullet, covered a mile in 52 1-5s., which did not equal the American record, viz., that of Henry Fournier on the Coney Island Boulevard, 51 4-5s.

The summaries: Thursday, March 26.—Daytona handicap, five miles, open to all vehicles—Oscar Hedstrom (Indian motor bicycle), handicap 1m. 5s., actual time 5m. 37s. H. T. Thomas (Oldsmobile racer), handicap 50s., actual time, 6m. 50s. Raymond Booth-

Beach Races—Ormond (Continued)

royd (Oldsmobile runabout), handicap 4m. 15s., actual time, 10m. 45s. Alex. Winton, scratch, actual time, 7m. 23s. Dr. Bennett (Oldsmobile), handicap 5m., actual time, 15m. 2s. Motor bicycle championship of Florida, one mile—W. W. Austin, 1st. D. P. Merrill, 2nd. Time, 1m. 36s.

Friday, March 27.—One mile—H. T. Thomas (Oldsmobile), against American record of 1m. 6 1/5s., for gasoline machines under 1,000 pounds—Time, 1m. 8 3/5s. One mile, for Ormond challenge cup—Alexander Winton (Winton Bullet). Time, 38s. No other competitor. One-mile motor cycle race—Oscar Hedstrom (Indian), 1st. Time, 1m. 11s. One mile against record of 1m. 12s., for steam carriages—J. F. Hathaway (Stanley), 1st. Time, 1m. 35s. Five miles, all machines—Oscar Hedstrom (Indian), 1st. Time, 5m. 30s. H. T. Thomas and Alexander Winton also started.

Saturday, March 28.—Ten miles—Alexander Winton (Winton Bullet), 1st. Time, 10m. 26s. One mile against record of 51 4/5s.—Alexander Winton, 1st. Time, 52 1/5s. One mile—H. T. Thomas (Oldsmobile), 1st. Time, 1m. 6 3/4s.

The first big Florida meet was held during the week of January 27, 1904, when W. K. Vanderbilt drove a mile in a 90-hp. Mercedes in exactly 39s. This was made in a trial against time. Other records made in races were as follows: 5 miles, 3m. 31 3/5s.; 10 miles, 6m. 50s.; 20 miles, 17m. 2s.; 30 miles, 24m. 11s.; 40 miles, 33m. 52 2/5s.; 50 miles, 40m. 49 4/5s.; all by W. K. Vanderbilt, Jr. (90-hp. Mercedes); 15 miles, 10m. 18s., H. L. Bowden (60-hp. Mercedes).

Following are the winners of the various races run during the week: One-mile invitation—W. K. Vanderbilt, Jr., 1st. Time, 48s. Five-mile invitation—W. K. Vanderbilt, Jr., 1st. Time, 3m. 34 3/5s. Five-mile free-for-all—W. K. Vanderbilt, Jr., 1st. Time, 3m. 31 3/5s. Ten-mile invitation—W. K. Vanderbilt, Jr., 1st. Time, 6m. 50s. Ten-mile championship—W. K. Vanderbilt, Jr. 1st. No time taken. Fifty-mile championship—W. K. Vanderbilt, Jr., 1st. Time, 40m. 49 4/5s. One-mile (56-second class)—H. L. Bowden, 1st. Time, 48s. One mile (1.05 class)—H. L. Bowden, 1st. Time, 52 2/5s. Fifteen-mile match race—H. L. Bowden, 1st. Time, 10m. 18s. Twenty-mile handicap—H. L. Bowden, 1st. Time, 18m. 40s. Five-mile handicap—S. B. Stevens, 1st. Time, 4m. 2/5s. Ten-mile handicap—S. B. Stevens, 1st. Time, 7m. 28 4/5s. One-mile A. A. A. championship—Bar-

Beach Races—Ormond (Continued)

ney Oldfield, 1st. Time, 46 2/5s. Fifteen-mile match race—M. G. Bernin, 1st. Time, 12m. 51 4/5s. Five-mile race for runabouts—Louis S. Ross, 1st. Time, 7m. 53 1/5s.

In January, 1905, another meeting occurred. The mile in 39s., made by W. K. Vanderbilt, Jr., the preceding year, was supplanted when H. L. Bowden drove a 120-hp. Mercedes the same distance in 32 4/5s.; he followed this up by covering a kilometer in 20 2/5s. Both were world's records, although not recognized as such by the A. A. A. The Mercedes car which Bowden drove was equipped with two regular Mercedes engines coupled together, the frame having been rebuilt to take the increased weight. Consequently the car exceeded the maximum weight of 1,000 kilograms (2,204 pounds) permitted under the racing rules of the A. A. A., and on this account the record was not allowed. The next best time for the mile was made by Arthur Macdonald, an English driver, in a Napier car, his mark being 34 2/5s., which was styled the official record for the distance.

In addition to these the following records against time and in competition were added to the table:

Tuesday, Jan. 24.—One kilometer race, for cars weighing from 851 to 1,432 pounds—Webb Jay (15-hp. White), 1st. Time, 44 2/5s. A. Le Blanc (20-hp. Darracq), 2nd. One-mile trials for stock cars—C. Soules (30-hp. Pope-Toledo), 1st. Time, 57s. Webb Jay (15-hp. White), 2nd. Time, 1m. 3/5s. Five miles, for stock cars costing from \$2,751 to \$4,000—C. Soules (30-hp. Pope-Toledo), 1st. Time, 5m. 13 3/5s. M. Roberts (40-hp. Thomas), 2nd. Time, 5m. 47 4/5s. Five-mile time trial, class B.—Guy Vaughn (40-hp. Decauville), 1st. Time, 4m. 34 2/5s. Five miles, for gasoline stock cars costing \$650 and under—M. B. Aultman (6-hp. Pope-Tribune). Time, 11m. 39 4/5s. No other starter. Five miles, for stock cars costing \$4,001 to \$6,000, inclusive—C. Soules (30-hp. Pope-Toledo), 1st. Time, 5m. 17 4/5s. Alex. Le Blanc (20-hp. Darracq), 2nd. Time, 6m. 22 2/5s. Five miles, for stock cars costing from \$651 to \$1,000, inclusive—Louis S. Ross (8-hp. Stanley), 1st. Time, 6m. 42 3/5s. C. N. Wheeler (12-hp. Glide), 2nd. Time, 8m. 16s. Five miles, time trial, class A—Arthur Macdonald (90-hp. Napier), 1st. Time, 3m. 32s. Five-mile handicap, open to first four cars in preceding competitions—H. P. Maxim (18-hp. Columbia), 1/47, 1st. Time, 7m. 18 1/5s. C. Soules (30-hp. Pope-Toledo), scratch, 2nd. Time, 7m.

Beach Races—Ormond (Continued)

28.4-5s. Five miles, time trial, class A—Arthur MacDonald (90-hp. Napier), 1st. Time, 3m. 17.2-5s. Ten miles, for stock cars costing from \$2,751 to \$6,000, inclusive—C. Soules (30-hp. Pope-Toledo), 1st. Time, 10m. 35.3-5s. B. B. Holcomb (35-40-hp. Columbia), 2nd. Time, 12m. 11.1-5s. Ten miles, time trial, class A—M. G. Bernin (60-hp. Renault), 1st. Time, 7m. 42s. Ten miles, for stock cars costing from \$1,001 to \$1,800, inclusive—M. J. Budlong (18-hp. Columbia), 1st. No time taken. C. N. Wheeler (12-hp. Glide), 2nd. No time taken.

Wednesday, Jan. 25.—One-mile time trials, classes A, B and C, given in order of running—J. L. Breese (class A) (18-hp. Mercedes), 1st. No time taken. W. K. Vanderbilt, Jr. (class A) (95-105-hp. Mercedes), 2nd. Time, 42.3-5s. One-mile international championship race for Dewar challenge trophy—Louis S. Ross (20-hp. Ross), 1st. Time, 42s. Arthur MacDonald (90-hp. Napier), 2nd. Time, 42.2-5s. One mile, for steam vehicles, for the Col. R. C. Clowry trophy—Louis S. Ross (20-hp. Ross), 1st. Time, 57.2-5s. Webb Jay (15-hp. White), 2nd. Time, 58.1-5s. One-mile Corinthian cup race, amateur owners only to drive, Col. L. C. Weir trophy—Louis S. Ross (20-hp. Ross), 1st. Time, 41.3-5s. S. B. Stevens (90-hp. Mercedes), 2nd. Time, 46.1-5s.

Thursday, Jan. 26.—One kilometer time trials, for classes A, B and C—A. C. MacDonald (90-hp. Napier), time, 23s. H. L. Bowden (120-hp. Mercedes), time, 23.3-5s. One kilometer race for the H. L. Bowden trophy—Arthur MacDonald (90-hp. Napier), 1st. Time, 27.3-5s. Louis S. Ross (20-hp. Ross), 2nd. Time, 28.1-5s. One kilometer, open only to vehicles weighing from 1,432 to 2,204 pounds—Louis S. Ross (20-hp. Ross), 1st. Time, 29.2-5s. S. B. Stevens (90-hp. Mercedes), 2nd. Time, 29.3-5s. One mile, for class A cars only—Louis S. Ross (20-hp. Ross), 1st. Time, 42s. S. B. Stevens (90-hp. Mercedes), 2nd. Time, 45.4-5s. One mile, for class B cars only—Webb Jay (15-hp. White), 1st. Time, 51.4-5s. Guy Vaughn (40-hp. Decauville), 2nd. Time, 54.2-5s.

Friday, Jan. 27.—Fifty miles, for American-made cars only, Lozier trophy—Walter Christie (60-hp. Christie), 1st. Time, 1h. 11m. 22.2-5s. Barney Oldfield (60-hp. Peerless), did not finish. Ten-mile special race, not on the program, for a wager of \$500 a side—Guy Vaughn (40-hp. Decauville), 1st. Time, 9m. 25.2-5s. R. Magondeaux (40-hp. Bollée), 2nd. Time, 9m. 27.3-5s.

Saturday, Jan. 28.—Ten miles, for Fiat cars only, Hollander and Tangeman

Beach Races—Ormond (Continued)

cup—Wm. Wallace (90-hp. Fiat), 1st. Time, 6m. 54.4-5s. Paul Sartori (90-hp. Fiat), 2nd. Ten miles, for Mercedes cars only—E. R. Thomas, 1st. Time, 6m. 31.4-5s. E. H. Fredericks, 2nd. Time, 7m. 44.1-5s. Ten miles, the Ormond Derby, for the C. J. S. Miller trophy—James L. Breese (35-hp. Mercedes), 1st. Time, 10m. 29.2-5s. Wm. Wallace (90-hp. Fiat), did not finish.

Monday, Jan. 30.—One hundred miles, for W. K. Vanderbilt, Jr., trophy—H. W. Fletcher (80-hp. De Dietrich), 1st. Time, 1h. 18m. 24s. M. G. Bernin (60-hp. Renault), 2nd. Time, 1h. 21m. 38s. Five miles, open, for W. Gould Brokaw trophy—E. R. Thomas (105-hp. Mercedes), 1st. Time, 3m. 30.1-5s. William Wallace (90-hp. Fiat), 2nd. Time, 3m. 46s. Five miles, Ormond handicap, for J. R. Moore trophy—Paul Sartori (90-hp. Fiat), 34s. handicap, 1st. Time, 3m. 57s. E. R. Thomas (105-hp. Mercedes), scratch, 2nd. Time, 4m. 2.1-5s.

Thursday, Jan. 31.—Fifty miles, handicap, for Burgoyne cup—Paul Sartori (90-hp. Fiat), 4.50 handicap, 1st. Time, 40m. 20s. E. Fredericks (90-hp. Mercedes), 4.01, handicap, 2nd. Time, 41m. 58.4-5s. Twenty miles, for E. R. Thomas trophy. Time contest, with one minute intervals between starters. Ten miles, with neutralized turn—Arthur C. MacDonald (90-hp. Napier), 1st. Time, 15m. 23s. William Wallace (90-hp. Fiat), 2nd. Time, 15m. 34s. Ten miles, for Major C. J. S. Miller trophy—Arthur C. MacDonald (90-hp. Napier), 1st. Time, 6m. 15s. E. R. Thomas (105-hp. Mercedes), 2nd. Time, 6m. 18.1-5s. Ten miles, handicap—C. Canant (45-hp. De Dietrich), 2.15 handicap, 1st. Time, 8m. 2.3-5s. M. Roberts (40-hp. Thomas), 3.20 handicap, 2nd. Time, 8m. 54.2-5s. Record trials, one mile—H. L. Bowden (120-hp. Mercedes), 1st. Time, 32.4-5s. Walter Christie (60-hp. Christie), 2nd. Time, 40s. Record trials, one kilometer—H. L. Bowden (120-hp. Mercedes), 1st. Time, 20.3-5s. A. C. MacDonald (90-hp. Napier), 2nd. Time, 25.1-5s.

In January, 1906, all speed records for the shorter distances were broken, and one for the larger, the new figures being: Kilometer, 18.2-5s.; mile, 28.1-5s.; 2 miles, 58.4-5s.; 5 miles, 2.47; 15 miles, 10m.; 100 miles, 1h. 15m. 40.2-5s. As in 1905, the meeting was held under the control of the A. A. A., with Chairman R. L. Morrell of the racing board in charge. The weather was bad, being unreasonably cold, and the beach was not in the best condition. The results, day by day, were as follows:

Beach Races—Ormond (Continued)

Tuesday, Jan. 23.—One-mile International, for the Sir Thomas Dewar trophy—Marriott (30-hp. Stanley), 1st. Time, 33s. Cedrino (Fiat), 2nd. Time, 38s. One-mile heavyweight championship—Lancia (110-hp. Fiat), 1st. Time, 37s., making a new competition record for gasoline cars. Fletcher (110-hp. Fiat), 2nd. Time, 37 3/5s. One-mile steam championship—Marriott (30-hp. Stanley) 1st. Time, 31 4/5s.

Wednesday, Jan. 24.—Five-mile open championship—Lancia (110-hp. Fiat), 1st. Time, 3m. 11-5s. Fletcher (110-hp. Fiat), 2nd. Time, 3m. 2s. Five-mile middleweight championship—Clifford Earp (100-hp. Napier), 1st. Time, 2m. 56s. Downey (90-hp. Mercedes), 2nd. Time, 3m. 29 1/5s.

Thursday, Jan. 25.—Fifteen-mile race for American touring cars, handicaps—Durbin (15-hp. Stanley), 1st. Time, with a 25s. start, in 13m. 42 2/5s. J. E. Bristol (30-hp. Stoddard-Dayton), 2nd. Time, with 12 1/2s. start, in 17m. 11 2/5s. Ten-mile Corinthian championship—S. B. Stevens (80-hp. Darracq), 1st. Time, 9m. 28s. J. L. Breese (35-hp. Mercedes), 2nd. Time, 9m. 47 3/5s.

Friday, Jan. 26.—Ten-mile middleweight championship—Guy Vaughn (80-hp. Darracq), 1st. Time, 7m. Cedrino (24-hp. Fiat), 2nd. Time, 7m. 50s. Ten-mile Corinthian handicap—H. N. Harding (45-hp. Daimler), 1st. Time, with 3m. 30s. start, in 8m. 48 4/5s. S. B. Stevens (80-hp. Darracq), scratch, 2nd. Time, 6m. 42 4/5s. Kilometer record trials, heavyweight class—Marriott (50-hp. Stanley), 1st. Time, 18 2/5s. Chevrolet (200-hp. Darracq), 2nd. Time, 19 2/5s. Middleweight class—Guy Vaughn (80-hp. Darracq), 1st. Time, 25s. Wurgis (32-hp. Reo), 2nd. Time, 34 2/5s. Lightweight class—Fleming (10-hp. Maxwell), 1st. Time, 59s. One-mile record trials, heavyweight class—Marriott (50-hp. Stanley), 1st. Time, 28 1/5s. Chevrolet (200-hp. Darracq), 2nd. Time, 30 3/5s. Middleweight class—Guy Vaughn (80-hp. Darracq), 1st. Time, 40 3/5s. Wurgis (32-hp. Reo), 2nd. Time, 52 3/5s. Lightweight class—Fleming (10-hp. Maxwell), 1st. Time, 1m. 29 2/5s.

Saturday, Jan. 27.—One-hundred-mile International, for Minneapolis cup—Earp (100-hp. Napier), 1st. Time, 1h. 15m. 40 2/5s. Cedrino (110-hp. Fiat), 2nd. Time, 1h. 16m. 39s.

Monday, Jan. 29.—Ten-mile open handicap—Lancia (110-hp. Fiat), 1st. Time, from scratch in 6m. 18 2/5s. Hilliard (80-hp. Napier), 2nd. Time, from 1m., in 8m. 34 5/5s. Thirty-mile championship, for American built cars—Mar-

Beach Races—Ormond (Continued)

riott (50-hp. Stanley), 1st. Time, 34m. 18 2/5s. Walter Christie (100-hp. Christie), 2nd. Time, 37m. 24 3/5s. Fifteen-mile championship—Lancia (110-hp. Fiat), 1st. Time, 10m., establishing new record. Hilliard (80-hp. Napier), 2nd. Time, 11m. 36 3/5s. Ten-mile open championship, combined with ten-mile heavyweight championship—Lancia (110-hp. Fiat), 1st. Time, 6m. 19 3/5s. Marriott (50-hp. Stanley), 2d. Time, 7m. 35 3/5s. One-mile middleweight championship—Guy Vaughn (50-hp. Darracq), 1st, no time taken. Two-mile-a-minute record trials—Demogeot (200-hp. Darracq), 1st. Time, 58 4/5s. Marriott (50-hp. Stanley), 2nd. Time, 59 3/5s.

In 1907 a much smaller number of entries were received, and the racing produced no records. Following are the results:

Tuesday, Jan. 23.—Five miles, from standing start—E. B. Blakely (70-hp. American Mercedes), 1st. Time, 4m. 25s. R. A. McCready (20-hp. Rolls-Royce), 2nd. Five miles, from flying start—Fred. A. Marriott (30-hp. Stanley), 1st. Time, 3m. 44 4/5s. R. A. McCready (20-hp. Rolls-Royce), 2nd. Time, 4m. 52 2/5s. Five-mile match race—P. E. Rogers (30-hp. Stanley), 1st. Time, 3m. 51 4/5s. E. B. Blakely (American Mercedes), 2nd. Mile American touring car championship—Frank Durbin (20-hp. Stanley), 1st. Time, 55 2/5s. R. A. McCready (20-hp. Rolls-Royce), 2nd. Time, 1m. 9 2/5s. Mile for touring cars carrying passengers—Ralph Owen (35-hp. Oldsmobile), 1st. Time, 1m. 37 3/5s. Asa Paine (35-hp. Winton), 2nd. Quarter-mile on high speed gear—W. A. Adriance (30-hp. Stoddard-Dayton), 1st. Time, 1m. 13s. Walter C. Baker (25-hp. Peerless), 2nd.

Wednesday, Jan. 24.—Five miles, standing start—E. B. Blakely (70-hp. American Mercedes), 1st. Captain C. E. Hutton (20-hp. Rolls-Royce), 2nd. Time, 4m. 52 4/5s. Five miles open, championship, flying start—F. H. Marriott (Stanley racer), 1st. Time, 3m. 44 1/4s. C. E. Hutton (20-hp. Rolls-Royce), 2nd. One-mile, flying start—W. Durbin (Stanley), 1st. C. E. Hutton (Rolls-Royce), 2nd. Five-mile match race—F. H. Marriott (Stanley racer), 1st. E. B. Blakely (70-hp. Mercedes), 2nd. Time, 3m. 51 4/5s. Won by 5 seconds. One-mile stock touring cars, driven by owners and carrying four passengers—Ralph Owen (35-hp. Oldsmobile), 1st. Asa Paine (30-hp. Winton), 2nd.

Thursday, Jan. 25.—One-hundred-mile championship, for the Minneapolis cup, over a fifteen-mile course, with seven

Beach Races—Ormond (Continued)

turns—E. Blakely (70-hp. American Mercedes), 1st. Time, 1h. 26m. 10s. C. E. Hutton (20-hp. Rolls-Royce), 2nd. Time, 2h. 2m. 35s. Ten-mile open handicap—E. B. Blakely (70-hp. American Mercedes), 1st. Time, with 45s. start, 13m. 59s. Dr. Stinson (30-hp. Franklin), 2nd. with 4m. 30s. start. Five-mile touring

Beach Races—Ormond (Continued)

cars—A. L. Kull (35-hp. Wayne), 1st. Time, 5m. 52 1-5s. W. C. Adriance (20-hp. Stevens-Duryea), 2nd. Time, 6m. 25s. One-mile record trials—F. H. Marriott (Stanley steam racer), 1st. Time, 31m. 4-5s. F. E. Stanley (30-hp. Stanley), 2nd. Time, 45m. 2-5s., establishing a record for steam touring cars.

TOURS

AMERICAN AUTOMOBILE ASSOCIATION.

New York to St. Louis tour, Monday, July 25, to Aug. 10, 1904. The tour was made up of two divisions, one starting from New York and the other from Boston. In the New York contingent were Augustus A. Post (White) and chauffeur; C. H. Gillette (Pope-Hartford) and Mrs. Gillette; Ray D. Lillibridge (White) and two passengers; Carl Page (White) and two passengers; Webb Jay (White) and passenger; H. C. Esseltyn (Franklin) and passenger; A. L. Pope (Pope-Toledo) and two passengers; R. B. Scott (Special Peerless) and four passengers; C. W. Birchwood (Haynes) and chauffeur; P. F. and R. G. Megargel (Elmore); W. C. Hurlburt (Cadillac) and two passengers; Dr. Huss (Oldsmobile) and passenger; A. J. and J. W. Seaton (Buckmobile); A. D. McLachlan (Royal) and two passengers; James M. Waters (Panhard) and chauffeur.

In the New England division were: Harlan W. Whipple (Mercedes), Mrs. Whipple and chauffeur; Charles J. Glidden (Napier), Mrs. Glidden and chauffeur; Frederick Lesh (Pope-Toledo), H. F. Lesh, Mrs. Camp, Ralph McClellan and chauffeur; F. N. Manross (Columbia), R. H. Manross, W. W. Horton and chauffeur; Percy Pierce (Pierce Arrow) and chauffeur; F. W. Richards (Phelps), Mrs. Richards and chauffeur; George H. Lowe (White), two passengers and chauffeur; George O. Draper (Packard), two passengers and chauffeur; L. Pope (Pope-Hartford) and passenger. The New England tourists joined those from New York at Albany.

The route and night stops were as follows: Monday, July 25—Poughkeepsie, N. Y., 76 miles. Tuesday, July 26—Albany, 75 miles, total 150 miles. Wednesday, July 27—Utica, 100 miles, total 250 miles. Thursday, July 28—Syracuse, 49 miles, total 299 miles. Friday, July 29—Rochester, 82 miles, total 381 miles. Saturday, July 30—Buffalo, 73 miles, total 454 miles. Monday, August 1—Erie, Pa., 94 miles, total 548 miles. Tuesday, August 2—Cleveland, O., 110 miles, total 658 miles. Wednesday, August 3—Toledo,

113 miles, total, 771 miles. Thursday, August 4—Waterloo, Ind., 93 miles, total, 860 miles. Friday August 5—South Bend, 76 miles, total, 940 miles. Saturday, August 6—Chicago, Ill., 102 miles, total, 1,042 miles. Monday, August 8—Pontiac, 91 miles, total 1,133 miles. Tuesday, August 9—Springfield, 94 miles, total, 1,227 miles. Wednesday, August 10—St. Louis, Mo., 91 miles, total, 1,318 miles.

Tourists in the parade into St. Louis in the order of their arrival at East St. Louis were: W. C. Hurlburt (Cadillac), A. A. Post (White), Webb Jay (White), E. T. Fetch (Packard), R. H. Johnson (Peerless), C. H. Birchwood (Haynes), D. B. Huss (Oldsmobile), Carl Page (White), P. P. Pierce (Pierce), W. C. Temple (Pierce), George H. Lowe (White), A. D. McLachlan (Royal), H. C. Esseltyn (Franklin), Harold Hoag (Covert), Charles J. Glidden (Napier), J. M. Waters (Panhard), C. H. Gillette (Pope-Hartford), H. F. Lesh (Pope-Toledo), A. D. Waite (White), H. L. Pope (Pope-Hartford), P. F. Megargel (Elmore), B. A. Lesh (Rambler) and R. G. Hauselin (Rambler).

Second annual A. A. A. tour and first annual contest for Charles J. Glidden trophy, from New York to Bretton Woods, N. H., and return, July 11 to July 22, 1905.

The deed of gift provides that the Glidden trophy, a handsome silver cup, shall be competed for annually, beginning with the year 1905, by members of any American Automobile Club affiliated with the American Automobile Association, or of any club in the world recognized by it. The club of which the winner is a member shall have the custody of the trophy until it is won by another, and shall give to the American Automobile Association, or its successor.

The distance to be driven in competition shall not be less than one thousand miles, nor less than five hundred miles weekly, and shall be over regularly used highways in the country where the holding club is located, except in the years 1905, 1906 and 1907, when the contest

Tours—A. A. A. (Continued)

shall be held in either the United States or Canada, or both.

Thirty-five cars, carrying 138 passengers, participated in the tour, which covered a distance of 871 miles. The itinerary of the tour from the start is as follows: Tuesday, July 11, New York to Hartford, Conn., 121.2 miles; Wednesday, July 12, Hartford to Boston, 122.5 miles; Thursday, July 13, Boston to Portsmouth, N. H., 63 miles; Friday, July 14, Portsmouth to Bretton Woods, 108 miles; Saturday, Sunday, Monday and Tuesday, July 15 to 18, short tours and climb to the clouds; Wednesday, July 19, Bretton Woods to Concord, N. H., 103 miles; Thursday, July 20, Concord to Worcester, Mass., 99 miles; Friday, July 21, Worcester to Pittsfield, 105 miles; Saturday, July 22, Pittsfield to New York, 149.5 miles.

Twenty-eight cars finished the tour, as follows: W. C. Temple (40-hp. Pierce), 4 p'ngs; H. W. Whipple (40-hp. Peerless), 4 p'ngs; Augustus Post (15-hp. White), 3 p'ngs; Carl Page (15-hp. White), 4 p'ngs; G. O. Draper (22-hp. Packard), 2 p'ngs; A. W. Church (40-hp. Decauville), 2 p'ngs; Percy P. Pierce (30-hp. Pierce), 5 p'ngs; Harold L. Pope (12-hp. Pope-Tribune), 2 p'ngs; Charles E. Walker (18-hp. Pope-Hartford), 3 p'ngs; A. L. Pope (45-hp. Pope-Toledo), 4 p'ngs; Benjamin Briscoe (16-hp. Maxwell), 4 p'ngs; J. D. Maxwell (8-hp. Maxwell), 2 p'ngs; E. H. Wood (18-hp. Napier), 3 p'ngs; E. A. Gilmore (18-hp. Rambler), 4 p'ngs; Walter C. White (15-hp. White), 2 p'ngs; Robert Lee Morrell (40-hp. Locomobile), 4 p'ngs; S. B. Stevens (20-hp. Darracq), 2 p'ngs; R. E. Olds (16-hp. Reo), 4 p'ngs; R. M. Owen (16-hp. Reo), 4 p'ngs; J. C. Kerrison (18-hp. Cadillac), 3 p'ngs; E. H. Fitch (15-hp. White), 4 p'ngs; E. H. Cutler (16-hp. Knox), 3 p'ngs; W. N. Eppig (15-hp. White), 4 p'ngs; Julius Mehlig (15-hp. White), 4 p'ngs; G. H. Tyrrell (15-hp. White), 3 p'ngs; W. A. Lamson (15-hp. White), 3 p'ngs; C. W. Kelsy (16-hp. Maxwell), 4 p'ngs; Ralph Coburn (16-hp. Maxwell), 4 p'ngs. The trophy was awarded to Percy P. Pierce, who finished with a perfect score.

Third Annual Tour of the American Automobile Association and second contest for the Charles J. Glidden trophy, from Buffalo to Bretton Woods, July 12 to July 28, 1906, covering a distance of 1,134 miles.

Seventy-six cars started, of which 49 competed for the Glidden Cup, and the remaining 22 in the A. A. A. division of

Tours—A. A. A. (Continued)

the tour for a cup offered by Paul H. Deming. The itinerary of the run was as follows: Thursday, July 12, Buffalo to Auburn, 135 miles; Friday, July 13, Auburn to Utica, 76 miles; Saturday, July 14, Utica to Saratoga, 95 miles; Sunday, July 15, stopped at Saratoga; Monday, July 16, Saratoga to Elizabethtown, N. Y., 94.1 miles; Tuesday, July 17, Elizabethtown to Lake Champlain Hotel, 37.7 miles; Wednesday, July 18, Lake Champlain Hotel to Montreal, 72 miles; Thursday, July 19, stopped at Montreal; Friday, July 20, Montreal to Three Rivers, 96.1 miles; Saturday, July 21, Three Rivers to Quebec, 97.9 miles; Sunday and Monday, July 22 and 23, stopped at Quebec; Tuesday, July 24, Quebec to Jackman, Me., 109 miles; Wednesday, July 25, Jackman to Waterville, Me., 95 miles; Thursday, July 26, Waterville to Rangeley Lakes, 105 miles; Friday, July 27, stopped at Rangeley; Saturday, July 28, Rangeley to Bretton Woods, 124 miles. Total distance, 1,134.8 miles.

On the arrival of the participants at Bretton Woods 13 cars had perfect scores, as follows: L. J. Petre, 45-hp. Stearns; Geo. M. Davis, 50-hp. Thomas; Geo. Soules, 30-40-hp. Pope-Toledo; W. C. Walker, 25-hp. Pope-Hartford; Philip J. Flinn, 32-hp. Pierce; Wm. E. Wright, 35-40-hp. Knox; Chas. F. Barrett, 24-28-hp. Columbia; Percy P. Pierce, 40-45-hp. Pierce; Archie E. Hughes, 40-45-hp. Pierce; Ernest Keeler, 28-30-hp. Oldsmobile; C. Burnam, 45-hp. Peerless; F. E. Wing, 24-hp. Marmon; Gus. G. Buse, 24-hp. Packard.

The fourth annual A. A. A. tour and the third contest for the Glidden trophy started from Cleveland, O., July 10 and ended in New York, July 24, 1907. As in 1906, there was also a division which contested for a trophy presented by Frank B. Hower, chairman of the touring committee. The event was participated in by 82 cars, 52 of which competed for the Glidden trophy, 14 for the Hower trophy, while the remainder were non-contestants.

The itinerary of the run was as follows: July 10, Cleveland to Toledo, 121 miles; July 11, Toledo to South Bend, 166.3 miles; July 12, South Bend to Chicago, 101.1 miles; July 13, Chicago to South Bend, 101.2 miles; July 16, South Bend to Indianapolis, 147.6 miles; July 17, Indianapolis to Columbus, 174.2 miles; July 18, Columbus to Canton, 150.6 miles; July 19, Canton to Pittsburgh, 99.8 miles; July 20, Pittsburgh to Bedford Springs, 97.2 miles; July 22, Bed-

Tours—A. A. A. (Continued)

ford Springs to Baltimore, 140.2 miles; July 23, Baltimore to Philadelphia, 171.9 miles; July 24, Philadelphia to New York, 98.2 miles. Total, 1,569 miles.

When the tour ended in New York there were 19 perfect score cars in the Glidden class as follows: R. D. Garden, New York M. C., 40-45-hp. Pierce; G. S. Salzman, A. C. of Buffalo, 60-hp. Thomas; M. Hallowell, A. C. of Buffalo, 60-hp. Thomas; Philip S. Flinn, Pittsburgh A. C., 40-45-hp. Pierce; G. Cabanne, St. Louis A. C., 40-hp. American Mors; F. S. Dey, A. C. of Buffalo, 60-65-hp. Pierce; H. H. Perkins, Pittsburgh A. C., 30-hp. Packard; A. Kumpf, A. C. of Buffalo, 40-45-hp. Pierce; C. P. Moore, Pittsburgh A. C., 50-hp. Welch; E. S. Lea, Mercer Co. A. C., 40-hp. Walter; R. M. Owens, A. C. of America, 40-hp. Reo; A. N. Jervis, N. Y. M. C., 40-hp. Berliet; R. H. Tucker, Cleveland A. C., 45-hp. Royal; W. C. White, Chicago A. C., 30-hp. White; A. J. Scaife, N. Y. M. C., 30-hp. White; Charles H. Burman, Cleveland, A. C., 30-hp. Peerless; W. C. Straub, Cleveland A. C., 30-hp. Peerless; Edward Noble, Chicago A. C., 50-hp. Haynes.

The 1907 event was run on a club team basis, the team with the best score to be awarded the trophy. The Buffalo Automobile Club won with a score of 981.4-5 points. The other club scores were as follows: Pittsburg Automobile Club, 977½ points; New York Motor Club, 683.4-5 points; Westchester Motor Club, 620.1-3 points; Automobile Club of America, 498½ points; Cleveland Automobile Club, 483.5-9 points, and Chicago Automobile Club, 240.1-7 points.

There were two perfect score cars in the Hower trophy class, H. K. Sheridan, Cleveland A. C., 30-hp. White; and G. S. Smith, Quaker City M. C., 35-hp. Stoddard-Dayton. These cars ran off the tie, Sheridan eventually winning the cup.

AUTOMOBILE CLUB OF AMERICA.

Five-hundred-mile Endurance Run, New York to Buffalo (called off on arrival at Rochester upon receipt of news of death of President McKinley). Monday, Sept. 9 to Friday, Sept. 13, 1901. First day's run, New York to Poughkeepsie, 84.4 miles; second day, Albany, 159.8 miles; third day, Herkimer, 242 miles; fourth day, Syracuse, 307.1 miles; fourth day, Rochester, 394.3 miles. Eighty-one cars started and forty-one reached Rochester. Certificates were awarded by the club to the following:

First class (average speed of 12 to 15 miles per hour).—David Wolfe Bishop, (30-hp. Panhard), average 15 miles, El-

Tours—A. C. A. (Continued)

mer Apperson, (8-hp. Haynes-Apperson), average 14.18 miles. Haynes-Apperson Co., (8½-hp. Haynes-Apperson), average 13.78 miles. Ohio Automobile Co. (12-hp. Packard), average 13.70 miles. White Sewing Machine Co., (6-hp. White), average 13.68 miles. J. R. Robinson, Jr., (16-hp. Robinson), average 13.63 miles. White Sewing Machine Co., (6-hp. White), average 13.55 miles. White Sewing Machine Co., (6-hp. White), average 13.48 miles. Foster Automobile Mfg. Co., (6-hp. Foster), average 13.19 miles. White Sewing Machine Co., (6-hp. White), average 13.07 miles. A. R. Shattuck, (12-hp. Panhard), average 13.05 miles. Albert T. Otto, (9-hp. Gasmobile) average 12.91 miles. A. L. McMurtry, (14-hp. Packard), average 12.83 miles. Ohio Automobile Co., (12-hp. Packard), average 12.79 miles. De Dion-Bouton Motorette Co., (5-hp. Motorette), average 12.64 miles. American Bicycle Co., (6-hp. Hydrocar), average 12.60 miles. C. Arthur Benjamin, (3¼-hp. Locomobile), average 12.58 miles. Truman J. Martin and Ellicott Evans, (15-hp. Packard), average 12.57 miles. Lane Motor Vehicle Co., (9-hp. Lane Surrey), average 12.25 miles. Alexander Fischer, (9-hp. Gasmobile), average 12 miles.

Second-class (average speed from 10 to 12 miles per hour).—Jefferson Seligman, (4½-hp. Columbia), average 11.92 miles. Percy Owen, (8-hp. Winton), average 11.82 miles. Geo. B. Pettengill, (4½-hp. Columbia), average 11.96 miles. Foster Automobile Mfg. Co., (6-hp. Foster), average 11.68 miles. Locomobile Co. of America, (3½-hp. Locomobile), average 11.62 miles. F. E. Lewis, 2nd, (7-hp. Long Distance), average 10.91 miles. G. N. Pierce Co., (2¾-hp. Pierce), average 10.69 miles. C. J. Field, (5-hp. De Dion-Motorette), average 10.38 miles. St. Louis Motor Carriage Co., (7-hp. St. Louis), average 10.17 miles. John M. Satterfield, (12-hp. Packard), average 10.11 miles.

Third-class (average speed from 8 to 10 miles per hour).—Alexander Dow, (12-hp. Winton), average 9.99 miles. John Jacob Astor, (12-hp. Gasmobile), average 9.78 miles. Louis S. Clarke, (8½-hp. Autocar), average 9.69 miles. Sidney Dillon Ripley, (9-hp. Gasmobile), average 9.64 miles. Locomobile Co. of America, (3½-hp. Locomobile), average 9.47 miles. Duryea Power Co., (8-hp. Duryea), average 8.71 miles. Knox Automobile Co., (4-hp. Knox), average 8.50 miles.

On the first day, Sept. 8, a contest was held on Nelson Hill, near Peekskill,

Tours—A. C. A. (Continued)

which was on the route to Poughkeepsie. The hill is 2,372 feet long, with a rise of about 260 feet; the steepest place is a 16 per cent. gradient. The surface was poor. The fastest ascent was made by D. W. Bishop, (30-hp. Panhard), in 2m. 13s., a Grout steamer being second in 2m. 45s. and a Locomobile steamer third in 2m. 47s.

Five-Hundred-Mile Reliability Run, New York to Boston and return, Thursday, Oct. 9 to Wednesday, Oct. 15, 1902. First day's run, New York to New Haven, 79 miles; second day, Springfield, 147.6 miles; third day, Boston, 244.2 miles; fourth day, Springfield, 340.8 miles; fifth day, New Haven, 409.4 miles; sixth day, New York, 488.4 miles. Maximum speed permitted, 14 miles per hour. Observers on all cars and penalties imposed for all involuntary stops.

Controls were officially established at the beginning of each day's run, at luncheon places, and at the end of each day's run. The start was made each morning at nine o'clock, and an hour and a half was allowed for luncheon.

No replacing of engines, boilers, axles or wheels was allowed. Such repairs only were permitted as could be accomplished with the tools and extra parts carried on the vehicle, and with such local assistance as could be readily obtained under ordinary touring conditions.

All stops from whatever cause were timed and recorded by the official observers. Stops for the following causes were considered involuntary stops, and did not count against the vehicle although such stoppages were recorded: (1) Compulsory stops of 1½ hours for luncheon, which were made at specified places indicated in the program; (2) road blocked by traffic; (3) tire troubles; (4) stoppage by police; (5) to avoid frightening timid horses; (6) to render aid in case of accident; (7) blocked railroad crossing; (8) demands of nature; (9) to recover articles accidentally dropped from vehicle; (10) to light carriage lamps. Steam vehicles were allowed a total of 20 minutes' stoppage for gasoline and water between controls in each half-day's run, for which marks were not deducted. One mark per minute was deducted for time thus consumed in excess of 20 minutes.

Seventy-five cars started, 55 being gasoline, 19 steam and 1 electric, and 68 finished. Perfect scores were made by 17 cars, as follows:

H. W. Whipple (Packard); H. B. Joy (Packard); Prescott Automobile Mfg. Co. (Prescott steamer); Lane Motor Ve-

Tours—A. C. A. (Continued)

hicle Co. (Lane); Haynes-Apperson Co. (Haynes-Apperson); Paul H. Deming, (White); Windsor T. White, (White); White Sewing Machine Co., (White); Grout Bros. Co., (Grout); Knox Automobile Co., (Knox); H. B. Shattuck, (Searchmont); John Wanamaker, (Searchmont); Oldsmobile Co. of New York, (Oldsmobile); Fredonia Mfg. Co., (Fredonia); Foster Auto Mfg. Co., (Foster).

LONG ISLAND AUTOMOBILE CLUB.

One-hundred-mile endurance run and hill climb, April 20, 1901. Held on a course on Long Island, starting at Jamaica, thence to Flushing, Manhasset, Roslyn, Oyster Bay, Jericho, Amityville, Mineola, Valley Stream and back to the starting point. Ribbons were awarded as follows: Blue to cars making no stops; red to cars making stops of less than 10 minutes; yellow to cars making stops of more than 10 minutes; white to cars stopping more than half an hour. Following were the ribbon winners:

F. Walsh (Gasmobile), blue ribbon, 100 P.C.; E. Apperson (Haynes-Apperson), blue ribbon, 100 P.C.; C. R. Greuter (Holyoke), red ribbon, 99 P.C.; C. J. Field (De Dion-Bouton), red ribbon, 98 P.C.; H. B. Barruch (Darracq), red ribbon, 97 P. C.; E. A. Law (Electric Vehicle Co.), yellow ribbon, 97 P.C.; C. Harmes (Daimler), yellow ribbon, 96 P.C.; A. L. McMurtry (Ohio), white ribbon, 91 P.C.

In a contest on a 10 per cent. grade at Roslyn special cups were awarded, as follows: For vehicles of more than 2,000 pounds, to C. R. Greuter (Holyoke), 1st, time, 2m. 10s. For vehicles of between 1,000 and 2,000 pounds to E. A. Law (Electric Vehicle), 1st, time, 2m. 45s. For vehicles of less than 1,000 pounds to C. J. Field (De Dion-Bouton), 1st, time, 1m. 48s.

NATIONAL ASSOCIATION OF AUTOMOBILE MANUFACTURERS

Endurance Run, New York to Pittsburgh, Wednesday, Oct. 7 to Thursday, Oct. 15, 1903. The official start was made from Weehawken, N. J. The run approximated 800 miles, divided into seven stages, averaging about 114 miles per day, as follows: Wednesday, Oct. 7, New York to Pine Hill, 135 miles. Thursday, Oct. 8, Pine Hill to Binghamton, 106 miles. Friday, Oct. 9, Binghamton to Bath, 103.5 miles. Saturday, Oct. 10, Bath to Buffalo, 122.5 miles. Monday, Oct. 12, Buffalo to Erie, 94 miles,

Tours—N. A. A. M. (Continued)

Tuesday, Oct. 13, Erie to Cleveland, 115 miles. Wednesday, Oct. 14, Cleveland to Youngstown, 68.5 miles. Thursday, Oct. 15, Youngstown to Pittsburg, 65.5 miles.

Thirty-four cars started, and 25 of these finished in the following order: Webb Jay (White), all controls. Holcomb (Columbia), all controls. Deming (White), all controls. W. H. Bex (Franklin), missed 3rd, 4th and 5th controls. A. Gardner (Rambler), all controls. John Wilkinson (Franklin), missed several controls. Stearns Stearns), all controls. A. L. Riker (Locomobile), missed two controls. E. S. Fetch (Packard), all controls. Dorris (St. Louis), lost six controls. Frank

Tours—N. A. A. M. (Continued)

Nutt (Haynes-Apperson), missed one control. Sheppy (Arrow), all controls. Davis (Knox), missed several controls. F. W. Whitman (Olds), missed two controls. Soules (Toledo), all controls. P. P. Pierce (Pierce), all controls. Winters (Toledo), missed two controls. Collier (Rambler), missed two controls. Roberts (Olds), lost two controls. Gaither (Fredonia), lost six controls. Thomas (Fredonia), lost five controls. Cowan (Knox), missed two controls. Fowler (Knox), lost three controls. Lauterman (Haynes-Apperson), lost five controls. Duffie (Columbia), missed six controls.

Heavy rains on the second, third and fourth days, while going over the mountains, caused much delay.

HILL CLIMBS

BOSTON, MASS.

Commonwealth Avenue, April 20, 1903.—Summaries: Steam vehicles—F. Durbin (5½-hp. Stanley), 1st. Time, 17m. J. H. MacAlman (5½-hp. Locomobile), 2nd. Time, 22m. 1-5s. Gasolene, under 2,000 pounds—F. E. Randall (5-hp. Stevens-Duryea), 1st. Time, 43m. 1-5s. A. T. Harris (8-hp. Duryea), 2nd. Time, 45m. Gasolene, over 2,000 pounds—J. L. Snow (16-hp. Peerless), 1st. Time, 43m. 2-5s. C. H. Robinson (16-hp. Peerless), 2nd. Time, 51m. 2-5s. Gasolene, with tonneau—J. L. Snow (16-hp. Peerless), 1st. Time, 51m. 4-5s. Gerard Bement (16-hp. Peerless), 2nd. Time, 51m. 4-5s. Electrics—W. G. Titcomb (3-hp. Waverley), 1st. Time, 1h. 16m. 3-5s. W. E. Eldridge (3-hp. Waverley), 2nd. Time, 1h. 40m. 2-5s. Motor bicycles—Joe Downey (1¾-hp. Warwick), 1st. Time, 28m. Oscar Hedstrom (1¾-hp. Indian), 2nd. Time, 28m. 1-5s. Grand final—F. Durbin (5½-hp. Stanley), 1st. Time, 16m. 3-5s. Joe Downey (1¾-hp. motor bicycle), 2nd. Time, 28m.

Commonwealth Avenue Hill, April 19, 1904.—Summaries: Electric vehicles weighing from 818 to 1,433 pounds—C. H. Barney (2½-hp. National), 1st. Time, 1m. 15 3-5s. H. E. Marvel (3-hp. Pope-Waverley), 2nd. Time, 1m. 15 3-5s. Gasolene cars weighing over 2,205 pounds—Arthur Adams (24-hp. Pope-Toledo), 1st. Time, 29 3-5s. Cars weighing between 1,433 and 2,205 pounds—H. L. Bowden (60-hp. Mercedes), 1st. Time, 15 2-5s. A. Adams (24-hp. Pope-Toledo), 2nd. Time, 24 4-5s. Cars weighing between 818 and 1,433 pounds—H. B. Hills, Jr. (40-hp. Georges Richard-Brasier), 1st. Time, 15 2-5s. Otto Nestrom (14-hp.), 2nd. Time, 18 4-5s. Cars weighing between 110 and 515

pounds—J. C. Robbins (6-hp.), 1st. Time, 33 2-5s. Guy Green (4-hp.), 2nd. Time, 1m. 5 1-5s. Steamers—C. B. Grout (12½-hp. Grout), 1st. Time, 21 3-5s. Louis S. Ross (6-hp. Stanley), 1st. Time, 18 3-5s. John Carney (4½-hp.), 2nd. Time, 42 2-5s. F. H. Marriott, Jr. (6-hp. Stanley), 1st. Time, 16 3-5s. K. M. Blake (4½-hp. Locomobile), 2nd. Time, 20s.

BRIDGEPORT, CONN.

Sport Hill, May 30, 1907.—Summaries: Stock cars up to \$1,000—Watson (12-hp. Maxwell), 1st. Time, 2m. 6s. Stock cars from \$1,000 to \$2,000—H. D. Gates (16-hp. Reo), 1st. Time, 2m. 19s. Stock cars from \$2,000 to \$3,000—H. H. Seymour (25-30-hp. Pope-Hartford), 1st. Time, 1m. 49s. Stock cars over \$3,000—N. W. Bishop (75-hp. Simplex), 1st. Time, 1m. 37 3-5s. Free-for-all-cars and runabouts up to \$5,000—Joseph Tracy (40-hp. Locomobile), 1st. Time, 1m. 24 2-5s.

CINCINNATI, O.

Paddock Road, May 19, 1906.—Summaries: Runabouts—1 to 12-hp.—A. R. Morgan (12-hp. Franklin), 1st. Time, 1m. 26s. A. G. Brunsman (12-hp. Stoddard-Dayton), 2nd. Time, 1m. 30s. Touring cars, tonneau attached, 12 to 24-hp.—Norwood Auto Co. (20-hp. Wayne), 1st. Time, 1m. 34s. J. Baum (20-hp. Buick), 2nd. Time, 1m. 47s. Touring cars, four passengers, 24 to 35-hp.—F. F. Bradley (35-hp. Pope-Toledo), 1st. Time, 1m. 9s. A. G. Brunsman (35-hp. Stoddard-Dayton), 2nd. Time, 1m. 18¼s. Touring cars, four passengers, 35 to 50-hp.—F. F. Bradley (35-hp. Pope-Toledo), 1st. Time, 1m. 7s. Henry Burkhold (50-hp. Thomas),

Hill Climbs—Cincinnati (Continued)

2nd. Time, 1m. 23s. Free-for-all—O. F. Pogue (24-hp. Packard), 1st. Time, 1m. 1s. W. A. Balke (24-hp. Packard), 2nd. Time, 1m. 24-5s.

CLEVELAND, O.

Stucky Hill, June 15, 1907.—Summaries: Country amateur championship—W. F. Hart (Stearns), 1st. Time, 1m. 20s. Al Engel (Reo), 2nd. Time, 1m. 39s. Stock runabouts under \$850—McGinnis (Reo), 1st. Time, *1m. 36 1-5s. A. B. Manley (Ford), 2nd. Time, 1m. 49 2-5s. *Protested; decided in favor of Ford. Stock runabouts under \$1,500—Robert Burman (Jackson), 1st. Time, 1m. 38 3-5s. C. R. Thomas (Reo), 2nd. Time, 1m. 44 4-5s. Stock touring cars under \$1,500—C. R. Thomas (Reo), 1st. Time, 1m. 46 1-5s. Al Engel (Reo), 2nd. Time, 2m. 8 1-5s. Stock runabouts under \$2,000—R. Burman (Jackson), 1st. Time, 1m. 32 4-5s. E. C. Ireland (Stoddard-Dayton), 2nd. Time, 1m. 32 4-5s. Stock touring cars under \$2,000—Robert Burman (Jackson), 1st. Time, 1m. 34 1-5s. McGinnis (Reo), 2nd. Time, 1m. 37 7-10s. Stock runabouts under \$3,000—M. J. Roseboro (Ford), 1st. Time, 1m. 13 1-5s. E. C. Ireland (Stoddard-Dayton), 2nd. Time, 1m. 32 1-5s. Stock touring cars under \$3,000—Kubeck (Ford), 1st. Time, 1m. 21 7-10s. A. Scufe (White), 2nd. Time, 1m. 27 9-10s. Stock runabouts under \$5,000—F. Leland (Stearns), 1st. Time, 1m. 33-10s. W. F. Hart (Stearns), 2nd. Time, 1m. 13 1-5s. Stock touring cars under \$5,000—C. Schilpp (Stearns), 2nd. Time, 57 1-10s. H. Lyttle (Pope-Toledo), 2nd. Time, 58 9-10s. Winner of event, as others were thrown out on account of protests. Stock cars over \$5,000—F. Leland (Stearns). Time, 1m. 11 1-10s. Only entrant. Piston displacement, two cylinder—R. Burman (Jackson), 1st. Time, 2m. 33s. C. D. Paxson (Jackson), 2nd. Time, 2m. 33s. Piston displacements, four cylinder—A. L. Campbell (Darracq), 1st. Time, 54 4-5s. C. Schilpp (Stearns), 2nd. Time, 56s. Piston displacement, six cylinder—F. Leland (Stearns). Time, 1m. 14s. Only entrant. Cars from 851 to 1,432 pounds—A. Brooks (Stoddard-Dayton), 1st. Time, 1m. 28 7-10s. J. McGinnis (Reo), 2nd. Time, 1m. 36 1-5s. Cars from 1,432 to 2,264 pounds—Walter White (White), 1st. Time, 47 2-5s. A. L. Campbell (Darracq), 2nd. Time, 51s. Free-for-all—Walter White (White), 1st. Time, 48 7-10s. F. Leland (Stearns), 2nd. Time, 52 9-10s. Special for electrics—Gruenfeld (Baker). Time, 1m. 41 1-2s. Only entrant.

Hill Climbs (Continued)

CRAWFORD NOTCH (WHITE MOUNTAINS).

July 30 and 31, 1906.—Summaries: July 30—Stock cars costing \$1,750 to \$2,250—F. Allen (28-hp. Oldsmobile), 1st. Time, 4m. 20s. Dwight B. Huss (28-hp. Oldsmobile), 2nd. Time, 6m 29 1-5s. Event for stock cars costing \$2,250 to \$3,000—J. H. Jones (30-hp. Knox), 1st. Time, 4m. 25 1-5s. Postponed till July 31 on account of rain.

July 31—Free-for-all—Guy Vaughn (30-hp. Stearns), 1st. Time, 2m. 48s. For stock cars, \$850, to \$1,200—H. E. Rogers (20-hp. Stanley), 1st. Time, 3m. 11 2-5s. H. Koehler (22-hp. Buick), 2nd. Time, 4m. For stock cars, \$1,200 to \$1,750—G. Crittenden (24-hp. Premier), 1st. Time, 4m. 1s. Wm. Rosewell (24-hp. Crawford), 2nd. Time, 4m. 18 4-5s. For stock cars, \$1,750 to \$2,250—F. Allen (28-hp. Oldsmobile), 1st. Time, 3m. 59 4-5s. R. Crawford (24-hp. Crawford), 2nd. Time, 4m. 12-5s. For stock cars, \$2,250 to \$3,000—C. F. Barrett (24-28-hp. Columbia), 1st. Time, 3m. 46 4-5s. H. E. Wilson (35-hp. Rambler), 2nd. Time, 4m. 3-5s. For stock cars, \$3,000 to \$4,000—G. O. Draper (24-hp. Packard), 1st. Time, 3m. 42s. For stock cars, \$4,000 to \$5,000—A. E. Morrison (30-hp. Stearns), 1st. Time, 3m. 4s. Guy Vaughn (30-hp. Stearns), 2nd. Time, 3m. 84-5s.

EAGLE ROCK (Near NEWARK, N. J.)

Nov. 27, 1902.—Summaries: Gasolene cars—O. P. Nestman (8-hp. Stevens-Duryea), time, 2m. 45s. Dr. H. Power (6-hp. Duryea), time, 4m. 26s. J. G. Dale (7-hp. Long Distance), time, 4m. 49 3-4s. C. E. Proctor (15-hp. Winton), time, 4m. 52 3-4s. H. M. Odiorne (7-hp. Long Distance), time, 5m. 20s. I. D. Plank (4-hp. Oldsmobile), time, 6m. 6s. L. J. Wyckoff (8-hp. Knox), time, 7m. 15s. Steam cars—W. J. Stewart (4-hp. Locomobile), time, 2m. 58 3-4s. E. P. Washburn (4 1-2-hp. Mobile), time, 3m. 8s. W. S. Stewart (4 1-2-hp. Locomobile), time, 3m. 43 3-4s. H. M. Wells (4 1-2-hp. Prescott), time, 3m. 43 3-4s.

Nov. 26, 1903.—Summaries: Gasolene cars under \$1,000—Crescent Automobile Co. (6 1-2-hp. Cadillac), 1st. Time, 3m. 19s. L. J. Wyckoff (4-hp. Orient Buckboard), 2nd. Time, 3m. 34s. For gasolene vehicles, from \$1,000 to \$1,800—Motor Car Co. (7-hp. Stevens-Duryea), 1st. Time, 1m. 38 1-2s. American A. S. Co. (10-hp. Franklin), 2nd. Time, 3m. 21 1-2s. For steam vehicles, all prices,

Hill Climbs—Eagle Rock (Cont.)

only one starter—A. Phelps (4-hp. Locomobile), 1st. Time, 3m. 54s. For gasoline vehicles, from \$1,800 to \$3,000—L. J. Phelps (15-hp. Phelps), 1st. Time, 2m. 21¼s. R. T. Heitmeyer (16-hp. Darracq), 2nd. Time, 3m. 55s. For gasoline vehicles over \$3,000—W. K. Vanderbilt, Jr. (30-hp. Mors), 1st. Time, 1m. 36¼s. F. A. La Roche (40-hp. Darracq), 2nd. Time, 1m. 46s. For electric vehicles, all prices—N. Y. Edison Co. (8-hp. Columbia), 1st. Time, 6m. 38¼s. H. C. Whipple (5-hp. National), 2nd. Time, 7m. 39¼s. Open for gasoline vehicles, all prices, touring conditions—L. J. Phelps (15-hp. Phelps), 1st. Time, 2m. 55¼s. A. Phelps (4-hp. Locomobile), 2nd. Time, 3m. 37¼s. Special event for gasoline vehicles under 1,800 pounds, only one starter—Motor Car Co. (7-hp. Stevens-Duryea). Time, 1m. 37s.

HARTFORD, CONN.

Albany Avenue, Sept. 14, 1907.—Summaries: For gasoline runabouts costing \$1,000 or less—Maxwell, time, 1m. 8 3/5s. Ford, time, 1m. 8 3/5s. Event a tie not run off. For gasoline runabouts costing from \$1,001 to \$2,000—Jackson, 1st. Time, 1m. 19 1/5s. Gasoline touring cars costing from \$1,001 to \$2,000—Franklin, 1st. Time, 1m. 15 3/5s. Jackson, 2nd. Time, 1m. 17 4/5s. Gasoline stock runabouts from \$2,001 to \$2,500—Knox, 1st. Time, 1m. 22 5/5s. Pope-Hartford, 2nd. Time, 1m. 22 5/5s. For gasoline stock touring cars costing from \$2,001 to \$2,500—Pope-Hartford, 1st. Time, 1m. 14 5/5s. Corbin, 2nd. Time, 1m. 7 4/5s. For stock runabouts costing from \$2,501 to \$3,000—Corbin, 1st. Time, 57 1/5s. Ford, 2nd. Time, 1m. 1 5/5s. For gasoline stock touring cars costing from \$2,501 to \$3,000—Corbin, 1st. Time, 1m. 8 2/5s. Pope-Hartford, 2nd. Time, 1m. 8 3/5s. For gasoline stock runabouts costing \$3,001 to \$4,000—Thomas, 1st. Time, 1m. 64 5/5s. For gasoline stock touring cars from \$3,001 to \$4,000—Stevens, 1st. Time, 1m. 1s. Free-for-all gasoline stock cars—Stevens, 1st. Time, 57 2/5s. Knox, 2nd. Time, 58 1/10s. Open for gasoline cars—Pope-Hartford, 1st. Time, 56 2/5s. Stevens, 2nd. Time, 56 3/5s. Special slow event for gasoline stock cars—Knox, 1st. Time, 3m. 59s. Ford, 2nd. Time, 6m. 58s. Open for motorcycles—Goerke (Indian), 1st. Time, 1m. 9s. For motor cycles not exceeding 18 cubic inches of piston displacement—Gustafson (Indian), 1st. Time, 56 4/5s.

Hill Climbs (Continued)

INDIANAPOLIS, IND.

Glen Valley Hill, May 24, 1906.—Summaries: Owner's contest, owners driving—Edgar Apperson (40-hp. Apperson), 1st. Time, 31 1/5s. W. L. Carr (20-hp. Buick), 2nd. Time, 41 2/5s. Light runabouts, carrying driver—S. W. Elston (12-hp. Franklin), 1st. Time, 35 3/5s. Harry Stutts (12-hp. Franklin), 2nd. Time, 53 4/5s. Runabouts, 1,432 to 2,204 pounds—Waltman (16-hp. Premier), 1st. Time, 42s. Whittle (20-hp. Buick), 2nd. Time, 42s. Light touring cars, 1,432 to 2,204 pounds, carrying three passengers and driver.—F. L. Moore (30-hp. Stoddard-Dayton), 1st. Time, 36 2/5s. Whittle (22-hp. Buick), 2nd. Time, 46s. Touring cars, over 2,204 pounds, carrying five passengers and driver—Howard Marmon (30-hp. Marmon), 1st. Time, 40 4/5s. Jap Clements (35-40-hp. National), 2nd. Time, 45 4/5s. Stock cars, listed under \$850—Cherry (16-hp. Leader), 1st. Time, 50 3/5s. Willis (10-hp. Maxwell), 2nd. Time, 1m. 3 5/5s. Stock cars listed from \$850 to \$1,500—Whittle (20-hp. Buick), 1st. Time, 37 2/5s. Wellsman (16-hp. Premier), 2nd. Time, 40 3/5s. Stock cars listed from \$1,500 to \$2,000—S. W. Elston (12-hp. Franklin), 1st. Time, 39 1/5s. Lambert (30-hp. Lambert), 2nd. Time, 42 4/5s. Stock cars listed from \$2,000 to \$3,000—F. L. Moore (35-hp. Stoddard-Dayton), 1st. Time, 32 1/5s. Howard Marmon (30-hp. Marmon), 2nd. Time, 36 3/5s. Stock cars listed above \$3,000—Apperson (40-hp. Apperson), 1st. Time, 33s. Stutts (28-30-hp. Peerless), 2nd. Time, 45 2/5s.

LOS ANGELES, CAL.

Box Springs Canyon, Dec. 1, 1906.—Summaries: For runabouts costing \$850 or under—Ford, 1st. Time, 7m. 50¼s. Maxwell, 2nd. Time, 8m. 48 4/5s. For runabouts costing \$1,250 or less—Buick, 1st. Time, 6m. 32 1/5s. Tourist, 2nd. Time, 7m. 11 4/5s. For touring cars costing \$1,600 or less—Buick, 1st. Time, 7m. 40 1/5s. Mason, 2nd. Time, 7m. 19s. For touring cars costing \$2,500 and under—Tourist, 1st. Time, 5m. 57s. Cadillac, 2nd. Time, 6m. 47 1/4s. Free-for-all, challenge cup for touring cars—Stevens-Duryea, 1st. Time, 5m. 41¼s. Packard, 2nd. Time, 5m. 50s. Free-for-all runabouts—Tourist, 1st. Time, 5m. 44 1/5s. Buick, 2nd. Time, 6m. 35s.

Hill Climbs—(Continued)

MINNEAPOLIS, MINN.

Riverside Hill, 2,000 feet long, average rise 10 per cent., June 26, 1905.—Summaries: Two miles, dealers' selling handicap, \$3,500 cars on scratch, other cars to be allowed 100 feet for each \$100 less in price—A. F. Comacho (12-hp. Franklin), 1,600 feet, 1st. Time, 2m. 25 3-5s. Mortimer Roberts (40-hp. Thomas), 500 feet, 2nd. Five mile special race—F. F. Cameron (16-hp. Cameron), 1st. Time, 6m. 11s. E. Parker (12-hp. Fiat), 2nd. Five miles, Empire handicap, open to all—Mortimer Roberts (60-hp. Thomas), 40s., 1st. Charles C. Wridgway (24-hp. Peerless), 55s., 2nd. Time, 7m. 13s. Match for \$2,000, between Barney Oldfield and Louis Chevrolet—Third heat and race, ten miles—Chevrolet (90-hp. Fiat), 1st. Time, 9m. 30 3-5s. Oldfield (60-hp. Peerless), 2nd. Time, 9m. 32 1-5s. Five mile heats, National Motor Car Championship of the American Automobile Association—Louis Chevrolet (90-hp. Fiat), 1st. Mortimer Roberts (60-hp. Thomas), 2nd. No time taken.

MT. WASHINGTON (WHITE MOUNTAINS).

July 11 and 12, 1904.—Summaries:

July 11—James L. Breese (40-hp. Daimler), time, 34m. 9 4-5s. A. E. Morrison (24-hp. Peerless), time, 36m. 44 1-5s. Alexander Winton (20-hp. Winton), time, 1m. 35s. Percy P. Pierce (24-hp. Pierce), time, 44m. 31 1/4s. H. Ernest Rogers (24-hp. Peerless), time, 48m. 7 2-5s. L. J. Phelps, time, 56m. 15 2-5s. Harry Fosdick (20-hp. Winton), time, 54m. 2-5s. Frank Nutt (12-hp. Haynes-Apperson), time, 1h. 32m. 25 2-5s. W. B. Jameson (Waltham), time, 2h. 9m. 38 4-5s. E. S. Cameron (6-hp. Brown), time, 2h. 7m. 8 3-5s. Benjamin Smith (7-hp. Oldsmobile), time, 1h. 25m. 14 1-5s.

July 12—For all vehicles weighing from 1,000 to 2,000 pounds. A. E. Morrison (24-hp. Peerless), 1st. Time, 29m. 6 4-5s. Webb Jay (10-hp. White), 2nd. Time, 42m. 19 4-5s. For all vehicles not exceeding 1,000 pounds in weight—F. G. Peabody (6-hp. Oldsmobile), 1st. Time, 20m. 46s. Benjamin Smith (Special), 2nd. Time, 2h. 16m. 55s. For motorcycles—Arthur Batchelder (2-hp. Metz), 1st. Time, 34m. 11 3-5s. F. R. Dickinson (Metz), 2nd. Time, 52m. 42 2-5s. Open to any vehicle—Harry Harkness (60-hp. Mercedes), 1st. Time, 24m. 37 3-5s. F. E. Stanley (6-hp. Stanley), 2nd. Time, 28m. 19 2-5s.

Hill Climbs—Mt. Washington (Cont.)

July 17 and 18, 1905.—Summaries:

July 17.—Runabouts costing \$650 or less—F. A. Park (6-hp. Olds), 1st. Time, 56m. 10 2-5s. S. G. Skinner (6-hp. Olds), 2nd. Time, 1h. 1m. 28 1-5s. For cars costing \$650 to \$1,000—F. E. Stanley (10-hp. Stanley), 1st. Time, 31m. 6 4-5s. F. H. Peabody (16-hp. Marion), 2nd. Time, 1h. 54m. 18 2-5s. For cars costing \$1,000 to \$2,000—R. M. Owen (16-hp. Reo), 1st. Time, 52m. 35 2-5s. J. D. Maxwell (16-hp. Maxwell), 2nd. Time, 1h. 27s. For cars costing \$3,000 to \$4,500—Charles Soules (30-hp. Pope-Toledo), 1st. Time, 29m. 37 2-5s. Percy P. Pierce (28-hp. Pierce), 2nd. Time, 38m. 45s.

July 18.—Cars costing \$2,000 to \$3,000—Webb Jay (10-hp. White), 1st. Time, 39m. 1s. Cars costing all over \$4,500—H. A. Valentine (50-hp. Richard Brazier), 1st. Time, 26m. 38 2-5s. Cars weighing from 551 to 881 pounds—Bert Holland (10-hp. Stanley), 1st. Time, 30m. 34 3-5s. F. F. Cameron (16-hp. Cameron), 2nd. Time, 1h. 3m. 34 2-5s. Cars weighing from 881 to 1,432 pounds—F. E. Stanley (15-hp. Stanley), 1st. Time, 29m. 17 2-5s. C. W. Kelsey (8-hp. Maxwell), 2nd. Time, 51m. 41 3-5s. Cars weighing from 1,432 to 2,204 pounds—Webb Jay (10-hp. White), 1st. Time, 33m. 32 2-5s. Free-for-all—W. H. Hilliard (40-60-hp. Napier), 1st. Time, 20m. 58 2-5s. Bert Holland (15-hp. Stanley), 2nd. Time, 32m. 17 3-5s. For cars any weight, cylinder fired, gasoline—Geo. Soules (45-hp. Pope-Toledo), 1st. Time, 47m. 24 4-5s. Motorcycles, under 2-hp., weight limit—S. T. Kellogg (1 1/4-hp. Indian), 1st. Time, 26m. 34s. Motorcycles over 2-hp., any weight, not over 5-hp.—S. T. Kellogg (3-hp. Indian), 1st. Time, 20m. 59 1-5s. O. Hedstrom (3-hp. Indian), 2nd. Time, 22m. 42s. Special two-cylinder class, gasoline—A. H. Weisser (22-hp. Buick), 1st. Time, 36m. 35 4-5s.

PAWTUCKET, R. I.

Stump Hill, Nov. 29, 1906.—Summaries: Steam runabouts—L. F. N. Baldwin (20-hp. Stanley), 1st. Time, 1m. 3-5s. B. F. Blackinton (20-hp. Stanley), 2nd. Time, 1m. 3s. Steam touring cars with tonneau—B. F. Blackinton (20-hp. Stanley), 1st. Time, 1m. 17 1-5s. L. F. N. Baldwin (20-hp. Stanley), 2nd. Time, 1m. 17 3-5s. Gasolene cars costing \$1,000 and under—C. C. Edwards (16-hp. Cameron), 1st. Time, 1m. 55 1-5s. D. W. Flint (15-hp. Ford), 2nd. Time, 2m. 4 3-5s. Gasolene cars costing \$2,000 and under—H. S. Wolfe (20-24-hp. Jackson), 1st. Time, 1m. 50s. R. L. Lippitt (12-

Hill Climbs—Pawtucket (Continued)

hp. Franklin), 2nd. Time, 1m. 59 1-5s. Gasolene cars costing \$3,000 and under—H. A. Capron (25-hp. Pope-Hartford), 1st. Time, 1m. 28s. E. F. Jones (35-hp. Stoddard-Dayton), 2nd. Time, 1m. 38 2-5s. Gasolene cars costing \$5,000 and under—Elliott Flint (30-hp. Packard), 1st. Time, 1m. 16s. J. L. Snow (30-hp. Peerless), 2nd. Time, 1m. 26s. Gasolene cars costing over \$5,000, touring cars only—W. P. Mather (60-hp. Fiat), 1st. Time, 1m. 24 1-5s. C. D. Snow (50-hp. Stevens-Duryea), 2nd. Time, 1m. 25 2-5s. Free-for-all, no restrictions—L. F. N. Baldwin (20-hp. Stanley), 1st. Time, 1m. 13 3-5s. B. F. Blackinton (20-hp. Stanley), 2nd. Time, 1m. 4 4-5s.

ROCHESTER, N. Y.

Dugdale Hill, Oct. 13, 1906.—Summaries: Cars of 16-hp. and under—R. G. Finucane (12-hp. Franklin), 1st. Time, 1m. 13 2-5s. R. Foote (12-hp. Franklin), 2nd. Time, 1m. 19s. Cars of 17 to 22-hp., inclusive—N. B. Stetsel (18-hp. Ford), 1st. Time, 1m. 7s. John Kelly (20-hp. Stevens-Duryea), 2nd. Time, 1m. 10s. Cars of 23 to 30-hp., inclusive—Arthur Demmler (28-30-hp. Pope-Hartford), 1st. Time, 54 1-5s. N. B. Stetsel (18-hp. Ford), 2nd. Time, 1m. 51 1-5s. Cars of 31 to 40-hp., inclusive—John Meiser (34-40-hp. Pope-Toledo), 1st. Time, 59s. N. B. Stetsel (18-hp. Ford), 2nd. Time, 1m. 5s. Cars above 40-hp.—Carl W. Storandt (30-35-hp. Stoddard-Dayton), 1st. Time, 57 3-5s. A. V. Hart (50-hp. Thomas), 2nd. Time, 1m. 64 5-5s. Free-for-all, including racing stripped cars—William Knipper (60-hp. Thomas), 1st. Time, 51 4-5s. J. P. Brady (28-30-hp. Pope-Hartford), 2nd. Time, 51 4-5s. Electric cars—George J. Bauer (Babcock), 1st. Time, 1m. 55s. Vernon Adkin (Columbus), 2nd. Time, 2m. 4 1-5s.

WILKESBARRE, PA.

Giant's Despair (Wilkesbarre mountain), May 10, 1906.—Summaries: Free for all racing and stripped cars—H. N. Harding (45-hp. English Daimler), 1st. Time, 2m. 16 1-15s. C. W. Kelsey (36-hp. Maxwell), 2nd. Time, 3m. 4 3-5s. Stock cars, costing \$1,000 and under—H. J. Koehler (22-hp. Buick), 1st. Time, 3m. 10 1-5s. Stock cars, costing \$1,500 and under—H. J. Koehler (22-hp. Buick), 1st. Time, 3m. 4 5-5s. E. P. Scheuffler (20-hp. Jackson), 2nd. Time, 4m. 49 2-5s. Stock cars, costing \$2,500 and under—Charles Soules (24-hp. Pope-Toledo), 1st. Time, 2m. 56 4-5s. H. J.

Hill Climbs—Wilkesbarre (Continued)

Koehler (22-hp. Buick), and Herbert Bittner (35-hp. Rambler), tied for 2nd place. Time, 3m. 21 1-5s. Stock cars, costing \$2,600 to \$3,600—Herbert Bittner (35-hp. Rambler), 1st. Time, 3m. 18 1-5s. S. A. Elliott (35-hp. Pope-Toledo), 2nd. Time, 3m. 25 3-5s. Stock cars costing \$5,000 and under—S. H. Hancock (50-hp. Stevens-Duryea), 1st. Time, 2m. 27s. Valentine Bliss (45-hp. Pope-Toledo), 2nd. Time, 3m. 12s. Stock cars, costing \$9,000 and under—H. N. Harding (45-hp. English Daimler), 1st. Time, 2m. 11 1-5s. S. A. Elliott (35-hp. Pope-Toledo), 2nd. Time, 3m. 16 3-5s.

Giant's Despair, May 30, 1907.—Summaries: Motorcycles, free for all.—Bill Wray (6-hp. Simplex-Peugeot), 1st. Time, 1m. 40s. Stock cars costing \$1,000 and under—H. A. Grant (14-hp. Maxwell), 1st. Time, 2m. 7s. Quaker City runabout class—D. Walter Harper (20-hp. Stanley), 1st. Time, 1m. 56 4-5s. Stock cars costing \$2,500 and under—Guy Hutcheson (24-hp. Corbin), 1st. Time, 2m. 31 3-5s. Stock cars costing \$4,000 and under—J. P. Hardy (25-hp. Pope-Hartford), 1st. Time, 2m. 54 5-5s. Stock touring cars, all prices and hp.—C. W. Hoffman (30-hp. Stearns), 1st. Time, 2m. 16 4-5s. Quaker City touring car class—C. W. Hoffman (30-hp. Stearns), 1st. Time, 2m. 13 2-5s. Stock cars costing \$5,500 and under—William Haupt (50-hp. Chadwick), 1st. Time, 2m. 23 3-5s. Stock cars costing over \$5,500—William Haupt (Chadwick), 1st. Time, 2m. Free-for-all racing and stripped cars—J. B. Ryall (60-hp. Matheson), 1st. Time, 1m. 59 2-5s.

WORCESTER, MASS.

Dead Horse Hill, one mile long, average rise, 13 per cent., May 25, 1905.—Summaries: Gasolene stock cars, all prices—M. Percival Whittall (24-hp. Pierce Arrow), 1st. Time, 3m. 15 2-5s. George D. Webb (35-hp. Columbia), 2nd. Time, 3m. 46s. Steam stock cars, all prices—B. Holland (10-hp. Stanley), 1st. Time, 1m. 38s. F. B. Durbin (10-hp. Stanley), 2nd. Time, 1m. 41s. Gasolene stock cars, not more than \$850—George H. Kimball (10-hp. Ford), 1st. Time, 3m. 26 1-5s. Forest H. Peabody (10-hp. Ford), 2nd. Time, 3m. 31s. Gasolene stock cars, not more than \$1,250—H. L. Newton (16-hp. Elmore), 1st. Time, 2m. 32 4-5s. W. Eldredge (22-hp. Buick), 2nd. Time, 2m. 43 4-5s. Gasolene stock cars, not more than \$2,000—Hiram P. Maxim (18-hp. Columbia), 1st. Time, 2m. 45 4-5s. Ralph Coburn (15-hp. Stoddard-Dayton), 2nd. Time, 3m.

Hill Climbs—Worcester (Continued)

5 1-5s. Gasolene stock cars, not more than \$3,000—J. F. Duryea (20-hp. Stevens-Duryea), 1st. Time, 2m. 14 4-5s. C. S. Henshaw (40-hp. Thomas), 2nd. Time, 2m. 22 3-5s. Gasolene stock cars, not more than \$6,000—John Snow (35-hp. Peerless), 1st. Time, 1m. 43 2-5s. George Soules (30-hp. Pope-Toledo), 2nd. Time, 1m. 46 3-5s. Cars from 1,432 to 2,204 pounds—A. L. Campbell (90-hp. Mercedes), 1st. Time, 1m. 9s. W. L. Hilliard (60-hp. Napier), 2nd. Time, 1m. 16s. Cars from 857 to 1,432 pounds—F. H. Marriott (10-hp. Stanley), 1st. Time, 1m. 34 2-5s. J. F. Duryea (20-hp. Stevens-Duryea), 2nd. Time, 1m. 42 2-5s. Cars from 551 to 851 pounds—B. Holland (10-hp. Stanley), 1st. Time, 1m. 24 2-5s. F. B. Durbin (10-hp. Stanley), 2nd. Time, 1m. 25 1-5s. Cars weighing over 2,204 pounds—Eddie Bald (35-hp. Columbia), 1st. Time, 1m. 49s. George Reed (40-hp. Stearns), 2nd. Time, 1m. 49 1-5s. All makes and prices—William L. Hilliard (60-hp. Napier), 1st. Time, 1m. 12 3-5s. George C. Cannon (50-hp. Grout), 2nd. Time, 1m. 21 1-5s.

Dead Horse Hill, May 26, 1906.—Summaries: Event 1—H. F. Granger (20-hp. Stanley), 1st. Time, 1m. 31s. M. P. Whittall (45-hp. Pierce), 2nd. Time, 2m. 1s. Events 4-5—Mrs. H. Ernest Rogers (10-hp. Maxwell), 1st. Time, 3m. 31s. Ralph Coburn (10-hp. Maxwell), 2nd. Time, 3m. 45 2-5s. Event 6—H. J. Koehler (22-hp. Buick), 1st. Time, 1m. 52s. R. M. Owen (16-hp. Reo), 2nd. Time, 2m. 1 2-5s. Event 7—Pope (16-hp. Reo), 1st. Time, 1m. 58 2-5s. M. P. Whittall (22-hp. Buick), 2nd. Time, 2m. 41s. Event 8—B. F. Crockett (22-hp. Buick), 1st. Time, 2m. 35 1-5s. T. M. Wetherbee (24-28-hp. Crawford), 2nd.

Hill Climbs—Worcester (Continued)

Time, 2m. 56 1-5s. Event 9—E. H. Thomas (16-hp. Reo), 1st. Time, 2m. 11 2-5s. E. Poor (24-28-hp. Crawford), 2nd. Time, 3m. 12 1-5s. Event 10—James Grady (24-25-hp. Pope-Hartford), 1st. Time, 1m. 50s. W. Kelsey (35-hp. Maxwell), 2nd. Time, 1m. 57 2-5s. Event 11—Geo. D. Emerson (30-hp. Marmon), 1st. Time, 2m. 26 1-5s. Event 12—H. E. Wilson (35-hp. Rambler), 1st. Time, 2m. 15 4-5s. F. Ewing (30-hp. Marmon), 2nd. Time, 2m. 25 2-5s. Event 14—Duryea (50-hp. Stevens-Duryea), 1st. Time, 1m. 14 3-5s. H. P. Maxim (40-45-hp. Columbia), 2nd. Time, 2m. Event 15—H. E. Harding (English Daimler), 1st. Time, 1m. 16s. John Shephard (Columbia), 1st. Time, 1m. 54 4-5s. Event 16.—W. S. Hilliard (80-hp. Napier), 1st. Time, 1m. 37 4-5s. F. E. Hill, Jr. (50-hp. Fiat), 1st. Time, 1m. 38 2-5s. Event 17—J. Downey (80-hp. De Dietrich), 1st. Time, 1m. 19 1-5s. Event 18—S. H. Hancock (50-hp. Stevens-Duryea), 1st. Time, 1m. 10s. L. Harding (60-hp. Daimler), 2nd. Time, 1m. 12s. Event 19—L. F. N. Baldwin (20-hp. Stanley), 1st. Time, 1m. 64-5s. H. Ernest Rogers (20-hp. Stanley), 2nd. Time, 1m. 13 2-5s. Event 20—Mrs. H. E. Rogers (10-hp. Maxwell), 1st. Time, 3m. 2s. Ralph Coburn (10-hp. Maxwell), 2nd. Time, 3m. 13s. Event 21—R. D. Grant (40-hp. Berliet), 1st. Time, 1m. 16s. H. E. Wilson (35-hp. Rambler), 2nd. Time, 1m. 58 2-5s. Event 22—S. B. Stevens (80-hp. Darracq), 1st. Time, 1m. 2s. Remington (50-hp. Stevens-Duryea), 2nd. Time, 1m. 9 2-5s. Event 23—A. C. Campbell Darracq, 1st. Time, 1m. 2 1-5s. R. D. Grant (Berliet), 2nd. Time, 1m. 19 4-5s. Special runabouts—G. H. Kimball (24-hp. Corbin), 1st. Time, 1m. 57s. G. A. Kimball (24-hp. Corbin), 2nd. Time, 1m. 59 4-5s.

Competitions, Foreign

EARLY FRENCH CONTESTS.

DATE		RACE	DISTANCE	TIME			WINNER
		1895.					
		Paris-Bordeaux-Paris	Kil. 1,192	H. 48	M. 48	S.	Levassor.
		1896.					
May	9.	Bordeaux-Langon	48	1	55		Bord.
May	24.	Bordeaux-Agen-Bordeaux	286	10	56		Bousquet.
Sept.	20.	Paris-Mantes-Paris	103	4	22	55	
Sept.	24.	Paris-Marseille-Paris	1,720	67	42	58	Mayade.
		1897.					
Jan.	29.	Marseille-Nice-Monte-Carlo	233	7	45	9	Chasseloupe.
April	4.	Criterium des motocycles.....	100	3	9	5	Viet.
June	20.	Coupé des motocycles.....	100	2	46	47	L. Bollée.
July	24.	Paris-Dieppe	161	4	13	33	Jamin.
Aug.	14.	Paris-Trouville	174	3	48	56	Jamin.
Aug.	22.	Paris-Cabourg	210	6	32	10	Bardin.
Aug.	23.	Lyon-Uriage-Lyon	300	11	8	23	Et. Giraud.
		1898.					
March	6.	Marseilles-Nice	226	6	53	45	Charron.
March	11.	Nice-Puget-Theniers	77	2	9	32	Balvay.
April	10.	Paris-Roubaix	287	7	29		Degrais.
April	28.	Criterium des motocycles.....	100	1	57	49	L. Bollée.
May	1.	Marseille	180	5	34	30	Marcellin.
May	2.	Perigueux	145	3	54	5	G. Leys.
May	11-12.	Paris-Bordeaux	573	15	15	44	R. de Knyff.
May	29.	Bordeaux-Agen	143	3	1	15	Petit.
June	14.	Coupé des motocycles.....	100	1	56	50	Marot.
July	5-17.	Paris-Amsterdam-Paris	1,502	33	4	34	Charron.
July	22.	Tours-Blois-Tours	100	1	53	15	Jamin.
July	30.	Lille-Calais-Lille		6	30		Kreutler.
Aug.	21.	Bordeaux-Biarritz	300	6	48		Loysel.
Aug.	21.	Paris-Dieppe	161	4	10		Teste.
Aug.	21.	Lyon-Lagnieu	48	1	3		Eldin.
Aug.	21.	Tourcoing-Bethune	108	2	26		Osmont.
Oct.	2.	Dijon-Besancon	98	2	13		Marcellin.
Nov.	6.	Paris-Beauvais	80	2	27		Ducom.
Nov.	26.	Chanteloup (hill climb).....			3	52	Jenatzy.
Dec.	11.	Valence-Die	70	2	17		Pouly.
Dec.	18.	Acheres, record du kilom.....			2	9	Chasseloupe
		1899.					
March	12.	Dinan-Guingamp-Dinan	180	4	42		Sebilleau.
March	21.	Nice-Castellane-Nice	120	2	52	50	Lemaitre.
April	2.	Paris-Roubaix	287	5	35	30	Osmont.
April	6.	Pau-Bayonne-Pau	206	3	52	56	Lemaitre.
April	23.	Criterium des Motocycles.....	100	1	56	32	Teste.
April	30.	Lyon-Vienne	32		39		Dubuisson.
May	14.	Chartres-Bonneval	106	2	3		De Mallac.
May	14.	Gardanne-St-Maximin	75	2	2	27	Mery.
May	14.	Coupé des motocycles	100	1	46	12	Beconnais.
May	21.	Bordeaux-Perigneaux-Bordeaux ..		4	46	45	Barbereau.
May	21.	Draguignan-Vidauban	85	2	18	42	J. Gondoin.
May	24.	Paris-Bordeaux	580	11	43	20	Charron.
June	11.	Aubagne-Aix	70	1	54	55	Bourret.
July	2.	Salon-Arles-Salon	100	1	47	19	De Farconnet.
July	11.	Toulouse	108	2	51	30	De Lymairae.
July	15.	Charbonnières-Roanne	160	3	49		Demester.
July	6-25.	Tour de France.....	2,300	44	33	39	R. de Knyff.
July	30.	Paris-St-Malo	391	7	11		Renaux.
July	30.	Lyon Vals	175	3	58	10	Lara.
Aug.	20.	Paris-Lille		5	18	35	Baras.
Aug.	20.	Lons-le-Saunier-Lyon	256	4	49	25	Beconnais.
Aug.	27.	Paris-Trouville	172	2	58	30	Antony.
Sept.	1.	Paris-Ostende		6	8		Baras.
Sept.	10.	Paris-Peronne		3	15	12	Ducom.

Competitions, Foreign—Early French Contests (Continued)

			Kil.	H.	M.	S.	
Sept.	10.	Nice-Puget-Theniers	65	1	41	12	Meyan.
Sept.	10.	Dinard-St.-Brieuc	135	2	51	28	Sebilleau.
Sept.	17.	Paris-Boulogne		4	17	44	Girardot.
Sept.	30.	Bordeaux-Biarritz	300	4	24		Levegh.
Nov.	12.	Chanteloup (hill climb).....			2	34 4-5	Beconnais.
Dec.	3.	Gaillon	1	1	16		Villemain.
1900.							
Feb.	4.	Coupé de Nice.....	213	5	37	44	Pinson.
Feb.	18.	Course du Catalogue.....	144	2	52	2	Girardot.
Feb.	22.	Pau	35	4	46	57	R. de Knyff.
March	11.	Paris-Rouen-Paris (voiturettes)...	220	4	51	4	Decauville.
March	26.	Nice-Marseille	196	3	25	30	R. de Knyff.
March	26.	Nice-Dranguignan-Nice	200	4	45	31	Chauchard.
March	30.	La Turbie (hill climb).....	16		19	2	Levegh.
April	4.	Salon	100	1	23	34	Beconnais.
April	4.	Coupé Provinciale (Salon).....	180	3	40	30	Chauchard.
April	15.	Paris-Roubaix	287	3	48		Baras.
May	3.	Criterium des motocycles.....	100	1	24	18	Marcellin.
May	17.	Criterium des voiturettes.....	50	1	51	49	Cotteteau.
May	21.	Criterium des motocyclettes.....	100	2	17	11	Buquet.
June	3-4.	Bordeaux-Perigneaux-Bordeaux ..	318	4	1	45	Levegh.
June	14.	Coupé Bennett (Paris-Lyon)....	566	10	36	23	Charron.
July	1.	Salon (criterium de Province)....	100	1	20	15	Jenatzy.
July	25-28.	Paris-Toulouse-Paris	1,348	20	50	9	Levegh.
Oct.	28.	Paris-Rouen (criterium de l'Alcool)	130	2	15		Giraud.
Nov.	4.	Chanteloup			3	45	Dr. Pascal.
Nov.	11.	Gaillon	1			55	Beconnais.

1 mile 1.67 kilometers.

ARDENNES (BELGIUM), CIRCUIT OF—1902-1907.

Organized by the Automobile Club of Belgium. An annual speed contest, held on a course in the Belgian Ardennes, starting at Bastogne and passing through Champlon, Saint-Hubert, Recogne, Neufchâtel, Habay-la-Neuve, Martelauge and returning to Bastogne; making a circuit that measures 120 k., which is covered five times, or 600 k. Until 1904 the race was run on a course measuring only 512 k.

The first contest was held July 31, 1902, with the following result: Cars—1st, Jarrott (Panhard), 5h. 33m. 39 3-5s.; 2nd, Gabriel (Mors); 3rd, Vanderbilt (Mors). Light cars—Rigolly (Gobron-Brillié), 6h. 2m. 16 4-5s. Voiturettes—Corre (Corre), 9h. 34m. 39s. Motorcycles—Osmont (de Dion-Bouton). Motorcyclettes—Derney (Clement).

Second contest was held June 22, 1903, with the following results: Cars—1st, de Crawlitz (Panhard), 5h. 52m. 7 3-5s.; 2nd, Girardot (C. G. V.); 3rd, de Brou (De Dietrich). Light cars—1st, Barras (Darracq), 6h. 30m. 38 1-5s. Voiturettes—1st, Wagner (Darracq), 3h. 55m. 27s. Motorcycles—1st, Demester (Griffin), 4h. 59m. 46s.

The third contest was held July 24 and 25, 1904, with the following results: Cars—Heath (Panhard), 6h. 30m. 49s.; Teste (Bayard-Clement). Light cars—1st, Clement (Bayard-Clement), 4h. 26m.

53 3-5s. Motorcycles—1st, Khuling (Minerva), 3h. 46m. 6 4-5s. Motorcyclettes—1st, Tavenaux (Gregorie), 3h. 50m. 51 3-5s.

The fourth contest was held August 7, 1905, resulting as follows: Cars—1st, Hemry (Darracq), 5h. 58m. 32s.; 2nd, Tart (Panhard), 6h. 3m. 37s.; 3rd, Le Blon (Panhard), 6h. 22m. 56s.; 4th, Wagner (Darracq); 5th, Heath (Panhard); 6th, De Caters (Mercedes). Voiturettes—1st, Wagner (Darracq), 46m. 32s.; 2nd, Tavenaux (Gregorie).

The fifth contest was held August 13, 1906, with the following results: Cars—1st, Duray (De Dietrich), 5h. 38m. 39 1-5s.; 2nd, Hanriot (Darracq), 5h. 40m. 21s.; 3rd, Rougier (De Dietrich), 5h. 50m. 11s.; 4th, Barillier (Brazier), 5h. 52m. 14s.; 5th, Gabriel (De Dietrich), 5h. 52m. 14s.; 6th, Clement (Bayard-Clement), 6h. 2m. 55s.; 7th, (De Dietrich), 6h. 4h. 38s.; 8th, Wagner (Darracq), 6h. 14m. 46s.; 9th, Salger (Mercedes), 6h. 14m. 50s.; 10th, Jenatzy (Mercedes), 6h. 15m. 9s.; 11th, Villemain (Bayard-Clement), 6h. 32m. 40s.; 12th, Garcet (Bayard-Clement), 6h. 51m. 37s. Motorcycles—1st, Giuppone (Griffin), 2h. 45m. 55s.; 2nd, Cissac (Griffin), 3h. 4m. 19s.; 3rd, Demester (Griffin), 3h. 16m. 7 4-5s. Touring class, 150 kilometers—1st, Meura (Savolea), 2h. 23m. 36s.; 2nd, Bandelet (Adler), 2h. 23m. 36s.; 3rd, Willy (Savolea), 2h. 40m. 11 2-5s.

The sixth contest was held July 25

Competitions, Foreign (Continued)

and 27, 1907, with the following results: July 25.—Cars—1st, Brabazon (Minerva), 6h. 14m. 52-5s.; 2nd, Koshoven (Minerva), 6h. 14m. 32s.; 3rd, Guinness, (Minerva), 6h. 15m. 24 2-5s. July 26.—Motorcycles, one leader class—1st, Peters (Minerva), 2h. 27m. 38s.; 2nd, Ruys (Minerva), 2h. 46m. 36s.; 3rd, Lambert (Minerva), 2h. 57m. 1s. July 27.—Cars—1st, Baron de Caters (Mercedes), 6h. 29m. 10 2-5s.; 2nd, Guinness (Darracq), 6h. 30m. 34 2-5s.; 3rd, Jenatzy (Mercedes), 6h. 40m. 40 4-5s. Voiturettes—1st, Portier (Minerva), 6h. 40m. 11s.; 2nd, Brabazon (Minerva), 6h. 40m. 46 1-5s.; 3rd, Wilford (Virimus), 7h. 15m. 25s.

AUVERGNE CUP CONTEST.— SEPT. 3-8, 1906.

This was a 1,000 kilometer event, in which 48 cars were entered. The results were as follows: 1st, Rigolly (Gobron), 17h. 19m. 35s.; 2nd, Dunesté (Gobron), 17h. 50m. 16s.; 3rd, Favoux (Gobron), 18h. 28m. 51s.; 4th, J. Gobron (Gobron), 18h. 33m. 23s.; 5th, Feuillet (Brouhot), 19h. 47m. 20s.; 6th, Baron Eynard (Gobron), 20h. 1m. 11s.; 7th, Hamelin (Rochet-Schneider), 20h. 18m. 43s.; 8th, Dubois (Herald), 20h. 26m. 18s.; 9th, Marechal (Brouhot), 22h. 37m. 20s.; 10th, Souchal (Brouhot), 22h. 37m. 20s.; 11th, Briand (Brouhot), 23h. 19m. 34s.; 12th, Pelisson (de Dion-Bouton), 23h. 43m. 37s.; 13th, Sire (Darracq), 24h. 3m. 5s.

BENNETT CUP RACE.—1900-1905.

In 1899 James Gordon Bennett presented a cup as a prize for an international speed contest. To stimulate the automobile industry of the various motor-vehicle-using countries, it was required that all competing cars should be built entirely in the country from which they were entered. It was also provided that no country should be permitted to have more than three cars in the race.

The first contest occurred June 14, 1900, between Paris and Lyons (556 k.). France was represented by a full team of three Panhard cars, driven by Rene de Knyff, Charron and Girardot, respectively. Belgium also had a full team, cars being driven by Baron de Caters, Jenatzy and Lefebvre. Alexander Winton represented America and S. F. Edge England. Germany was represented by one car, the driver inscribing himself "Eugene."

De Caters, Lefebvre and Edge did not take part in the race. R. de Knyff, Win-

Competitions, Foreign (Continued)

ton and Jenatzy had to give up, and the winner was Charron (44-hp. Panhard), who covered the distance in 9h. 9m. Girardot came in second in 10h. 36m. on a Panhard car.

The second race was run in 1901 concurrently with the Bordeaux-Paris contest. Two cars, a Panhard and a Mors, represented France, while a Napier driven by Edge was England's representative. Of the starters Girardot driving the 50-hp. Panhard alone finished the race. He covered the distance of 527.65 km. in 8h. 54m. 59½s.

The third Bennett race took place on June 26, 1902, in connection with the Paris-Vienna race. France was represented by Girardot (C. G. V.), Fournier (Mors), de Knyff (Panhard). S. F. Edge again represented England in a Napier. The cup was won by Edge, who was the first to reach the control at Innsbruck.

The fourth race, in 1903, was held in Ireland. England was represented by three Napier (40-hp.) cars driven by Edge, Jarott, and Stocks. France sent de Knyff (70-hp. Panhard). Farman (Panhard) and Gabriel (80-hp. Mors). America was represented by two Wintons, one of them driven by Alexander Winton and the other by Percy Owen, and a Peerless driven by E. P. Mors. The race was won by Jenatzy (Mercedes), in 6h. 39m., his gross time, counting the time lost in the controls, being 10h. 15m. France was second, with de Knyff (Panhard), in 6h. 50m. 40s. Another Frenchman, Farman (Panhard), was third; Gabriel (Mors), was fourth, while Edge (Napier), England's winner of the year before, was fifth.

The fifth race took place June 17, 1904, at Taunus in Germany. Seven nations were represented; viz, Germany, France, England, Austria, Italy, Belgium and Switzerland. America did not take part.

Théry was the winner in 5h. 50m. 38s.; Jenatzy was second in 6h. 1m. 28s. and de Caters third in 6h. 45m. 3s. The rest came in in the following order: 4th, Rougier (France), 6h. 47m. 11 1-5s.; 5th, Braun (Austria), 6h. 59m. 49 1-5s.; 6th, Hautvast (Belgium), 7h. 2m. 36 2-5s.; 7th, Salleron (France); 8th, Lancia (Italy); 9th, Girling (England); 10th, Cagno (Italy); 11th, Werner (Austria); 12th, Jarott (England).

The 1905 race was run in France on the Auvergne circuit. Six countries, France, England, Germany, Italy, Austria, and America were represented, each having a full team of three cars. Every one of the 18 cars started. Following were the results: 1st, Théry (Brasier), 7h. 2m. 42 3-5s.; 2nd, Nazzaro

Competitions, Foreign (Continued)

(Fiat), 7h. 19m. 9 1-5s.; 3rd, Cagno (Fiat), 7h. 21m. 22 3-5s.; 4th, Caillois (Brasier), 7h. 27m. 6 2-5s.; 5th, Werner (Mercedes), 8h. 3m. 30s.; 6th, Duray (De Dietrich), 8h. 5m. 50s.; 7th, De Caters (Mercedes), 8h. 11m. 11 3-5s.; 8th, Rolls (Wolsley), 8h. 26m. 42 3-5s.; 9th, Clifford Earp (Napier), 8h. 27m. 29 4-5s.; 10th, Braun (Mercedes), 8h. 33m. 53 5-5s.; 11th, Bianchi (Wolsley), 8h. 38m. 39 2-5s.; 12th, Lytle (Pope-Toledo), 9h. 30m. 32s.

BLACKPOOL, ENGLAND, (MEETING OF).

Oct. 12 and 13, 1906.—The following were the different final winners: 1st, Brice (a road motorcycle); 1st, Giupone (on a Peugeot racing motorcycle); 1st, Rimmer (Vulcan); 1st, Day (a Talbot car); 1st, Wright (Darracq); 1st, Rawlinson (Darracq). The flying start kilometer test was won in the different categories by Reed (Peugeot racing motorcycle), in 45 4-5m.; by Cissac (racing motorcycle), in 29m.; by H. Walker (80-hp. Darracq), in 30 2-5m.; Warwick Wright (100-hp. Darracq), in 26m.; Guinness (200-hp. Darracq), in 21m. The standing start kilometer test shows the following winners: Huntley Walker (80-hp. Darracq), in 41 2-5m.; Warwick Wright (100-hp. Darracq), in 35m.; Guinness (200-hp. Darracq), in 32 2-5m.

BORDEAUX-BIARRITZ.

This test took place Oct. 3, 1899, in very bad weather. A category of tourists had been established which made the entire distance in two stages; Bordeaux. Mount-de-Marscut, Briaritz, with a night's rest at Mount-de-Marscut. The result of the speed category was as follows: 1st, Levegh, in 4h. 23m.; 2nd, Antony, in 4h. 31m. 30s.; 3rd, Yves Petit, in 4h. 56m. 8s.; 4th, Koechlin, in 5h. 19m. 2s.; 5th, Broc, in 5h. 32m. 20s.; 6th, Edmond Georges, in 5h. 38m. Motorcycles—1st, Bertin, in 4h. 40m.; 2nd, Rigal, in 7h. 51m. Voiturettes—1st, Ravenez, in 6h. 23m. Tourists—1st, Lafitte, in 7h. 17m.

BOULOGNE-SUR-MER (MEETING OF).

The meeting, which took place July 18, 19 and 20, 1906, was organized at Boulogne-sur-Mer by the Boulogne section of the A. C. of the North. The cup of Caters was run with the following results: 500 metres up hill with flying start—1st, Wagner (on 100-hp. Darracq), in 17 3-5m.; 2nd, Cecil Edge

Competitions, Foreign (Continued)

(on 100-hp. Napier), in 35 3-5m. One kilometre up hill, flying start—1st, Franchomme (on 100-hp. Darracq), in 38 1-5m.; 2nd, Lattuire (on 24-hp. Cottin-Desgouttes), in 59 4-5m.; 3rd, Cottin (on 24-hp. Cottin-Desgouttes), in 1m. 5s.

CATERS (CUP OF).

On July 16th, 1905, was disputed, upon the coast of Doullens, the challenge cup offered by M. Pierre de Caters. The results were (500 metres up hill flying start): 1st, Wagner (80-hp. Darracq), in 15 1-5m.; average per hour 118 km. 422 m.; 2nd, Hanriot (Bayard-Clement), in 15 4-5m.

CHATEAU THIERRY.

In 1905 the contest was run on Oct. 1, with the following result: Speed class, motorcycles less than 50ks.—1st, Angani (Alcyon), 55 3-5m. Voiturettes—1st, De la Touloubre (Darracq), 53 3-5m. Light cars—1st, Hanriot (Darracq), 41 3-5m. Cars—1st, Clifford Earp (Napier), 38 1-5m.; 2nd, Stead (Mercedes); 3rd, Faure.

CIRCUIT OF THE NORTH (910 KILOMETERS).

May 16 and 18, 1902.—An alcohol race organized by the Minister of Commerce and the A. C. F. Paris-Chalons-Arros-Dieppe-Paris. The results were as follows: Cars—1st, Panhard (Maurice Farman); 2nd, Panhard (Jarott); 3rd, Gardner-Serpollet; 4th, Gardner-Serpollet; 5th, Gardner-Serpollet. Light cars—1st, Darracq (Marcellin); 2nd, Panhard; 3rd, Gobron-Brillie; 4th, Panhard. Voiturettes—1st, Renault (Grus); 2nd, Renault (Oury); 3rd, Renault (Cormier); 4th, Clement; 5th, Darracq; 6th, Corre. Motorcycles—1st, de Dion-Bouton (Bardeaux).

CIRCUIT, SICILIAN, FOR VOITURETTES.

Sept. 5, 1906, Palermo-Petreola-Palermo Circuit (247 kilometers). First prize, Chevalier Florio (de Dion-Bouton), time, 7h. 25m. 12s.; 2nd, Longoni (de Dion-Bouton); 3rd, Tasca (de Dion-Bouton).

COMMISSION SPORTIVE CUP CONTEST.

This race, which was for voiturettes, was run in France on July 2, 1907, over the same course as the Grand Prix. Six cars finished in the following order: De Langhe, Darracq 1, 5:13:25; Mot-

Competitions, Foreign (Continued)

tard, La Buire, 5:26:19 2-5; Demogeot, Darracq 11, 5:27:56 2-5; Sibour, La Buire, 5:29:2; Dumame, La Buire, 5:45:40; Defries, Porthos, 6:25:10.

COUPE DE LA PRESSE.

This contest was run on August 6, 1907, on a 77 kilometer course in France. The race was five times around this circuit. The first three finished in the following order: Renaux (Peugeot), 4h. 32m. 56s.; Vimont (Westinghouse), 4h. 36m. 35s.; Zelede (de Dion), 4h. 44m. 46s.

CRITERION OF BELGIUM.

Organized by the Automobile Club of Belgium, Namur, Luxembourg, and Spa July 20 and 26, 1906. The results were as follows: Sixth class—1st, Hautvast (Pipe), in 6h. 45m. 14s.; 2nd, Croquet (Darracq), in 6h. 57m. 25s. Fifth class—Rigoly (Gobron), in 7h. 26m. 37s.; Dallemagne-Elskamp (Gobron), in 7h. 35m. 56s.; 3rd, Fiat; 4th, Gobron; 5th, Aries; 6th, Martini. Fourth Class—Fischer (Vivinus), in 8h. 7m. 45s.; 2nd, Pipe; 3rd, Pipe; 4th, N. A. G.; 5th, N. A. G.; 6th, Pipe. Third Class—Coquart (Aries), in 7h. 22m. 27s.; 2nd, La Metallurgique.

DOURDAN (FRANCE).

Kilometer and mile speed trials were held Oct. 5, 1905, the results being as follows: Standing mile, light motorcycles—1st, Peugeot (Cissac), 53 1-5m. Motorcycles—1st, Peugeot (Giuppone), 57m. Voiturettes—1st, Darracq (De la Touloubre), 1m. 13 1/4s. Light cars—1st, Darracq (Hanriot). Cars—1st, Napier (Clifford Earp), 53 4-5m.; 2nd, Mercedes (Faure). Flying kilometer, light motorcycles—1st, Peugeot (Cissac), 27 3-5m. Motorcycles—1st, Peugeot (Giuppone), 28m.; 2nd, Buchet (Anzani); Alcyon (Chauvet). Voiturettes—1st, Darracq (De la Touloubre), 38 4-5m. Light cars—1st, Darracq (Hanriot), 29 2-5m. Cars—1st, Napier (Clifford Earp), 25 3-5m.; 2nd, Mercedes (Faure).

Oct. 21, 1906, the results were as follows: Standing mile, large cars—1st, 200-hp. Darracq (Lee Guinness), 47 2-5s.; 2nd, Itala, 59 3-5s. Light cars—1st, 30-hp. Gladiator (Leon Molon), 1m. 4s.; 80-hp. Darracq, 59 2-5s. (disqualified for excess of weight). Voiturettes—1st, Vulpes I, 44 3-5s. Motorcycles—1st, Anzani III., 30 1-5s.; average hour, 119 km. 205; 2nd, Mototri Contal, 1m. 32 2-5s.

Flying kilometer, large cars—1st, 200-hp. Darracq (Lee Guinness), 20m. (mean per hour 180 km.); 2nd, Itala, 29 2-5m.; 3rd, Mors, 41 1-5m. Light

Competitions, Foreign (Continued)

cars—1st, Bayard II. (Villemain), 26 3-5m. (mean per hour 135.338 km.); 2nd, Gladiator, 31 3-5m.; Darracq, disqualified for excess of weight. Voiturettes—1st, Vulpes I, 44 3-5m. Motorcyclettes—1st, Peugeot (Giuppone), in 28m. (mean per hour 128.57 km.); 2nd, Peugeot (Cissac), 28 3-5m. Motorcycles—1st, Anzani III., 30 1-5m. (mean per hour 119.2 km.); 2nd, Mototri Contal I., 39 1-5m.

EMPEROR'S CUP RACE.

Held June 13 and 14, 1907, over the Taunus course, Germany, 500 k. Open to cars conforming to these conditions: Cylinder capacity 8 liters as a maximum; wheel-base, 3 meters; weight of vehicle, inclusive of carriage-work, 1,175 kilograms; minimum height of seats, 25 centimeters; minimum clearance, 15 centimeters; backward running (reverse), obligatory; three cars as a maximum of each make.

Two elimination trials, run the day previous to the big race, disposed of 52 of the 92 entrants, leaving 40 cars to start in the final run. The 31 German cars were painted white; 21 French, blue; 19 Italian, red; 10 Belgian, yellow; 4 English, green; 3 Austrian, orange and black, and 3 Swiss, red and yellow. Twenty of the starters finished in the following order: Nazzaro, 5:34:26; Hautvast, 5:39:10; Joerns, 5:39:49; Michel, 5:49:35; Wagner, 5:50:53; Lancia, 5:51:11; Minoia, 5:51:15; Fournier, 5:53:18; Salzer, 5:57:33; Cagno, 5:59:12; Schmidt, 6:3:31; Beutler, 6:5:11; Roygier, 6:8:15; Jenatzky, 6:8:54; Beck, 6:21:14; Fabry, 6:29:11; Tommaselli, 6:31:45; Scholz, 6:35:33; Schmidt, 6:46:45; Adelberger, 7:13:8.

FREJUS (TOURING COMPETITION OF THE AUTOMOBILE CLUB OF).

This took place May 27, 1906, upon a course of 125 km., passing through Frejus, Brignoles, Draguignan, Frejus. Results were as follows: Cars—1st, Peugeot (16-hp.) in 3h. 2m. 20s.; 2nd, Peugeot (10-hp.); 3rd, de Dion (6-hp.); 4th, Gladiator (15-hp.); 5th, Peugeot (6-hp.); 6th, Aster (12-hp.); 7th, de Dion (8-hp.). Motorcycles—1st, Alcyon (6-hp. Laurin-Klement), in 2h. 51m.; 2nd, Griffon (3 1/2-hp.); 3rd, Griffon (3 1/2-hp.).

GAILLON HILL—1889-1906.

A hill 1k. long, straight, and from 5 to 9 per cent. rise. First contested under the auspices of Velo, Nov. 12, 1899, there being 95 entries. Villemain

Competitions, Foreign (Continued)

made the best time. Category without chain, 1m. 16 1-5s. (48.37 an hour). Motorcycle category with chain, 1h. 20m.

In 1900 the contest was conducted by the Motor Club of France and held Nov. 11. In the motor car category, Brasier took the first place in 1m. 26 1-5s. Beconnais (motorcycles) made 55s. (65 km. an hour).

The 1901 contest was held Nov. 18, and Rigolly made the best time of any class, having ascended the hill at the rate of 72k. per hour.

Oct. 12, 1902, was the date of the fourth contest, which was organized by L'Auto. The prize was 11,500 francs, and there were 158 cars entered, of which 82 started. A Serpollet steam car driven by Le Blon made the best time, the rate of speed being 100k. per hour.

In 1903 the contest occurred on Nov. 8th and resulted in another victory for Rigolly, who attained a speed of 107k. per hour.

In 1904 the date was Oct. 30th and resulted in a dead heat between Barras and Clement.

The seventh contest was held in 1905 in bad weather, and resulted as follows: Large cars—P. de Caters (Mercedes), 31s. (mean per hour 116.129 km.); Villemain (Bayard-Clement), 32s. Light cars—1st, Clement (Bayard-Clement), 32m. 1st, Hanriot (Darracq), dead heat, 32 4-5s. Voiturettes—1st, Baneaux (Vulpes), 45s.; 2nd, De la Touloubre (Darracq). Motorcycles—Cissac (Peugeot), 31s.; 2nd, Giuppone (Peugeot).

The 1906 contest was held Oct. 28, the results being as follows: Large cars—1st, Lee Guinness (200-hp. Darracq), 25s. (average per hour 144 km.); 2nd, Cecil Edge (Napier), 29s.; 3rd, Longchamps (Itala), 34 3-5s. Light cars—1st, Demogeot (Darracq), 29s. (average per hour 124.8 km.); 3rd, Gladiateur, 39s. Voiturettes—Barriaux (Vulpes), 46 2-3s. Motorcycles—1st, Cissac (Peugeot), 27 4-5s.

GRAND PRIX OF THE A. C. F.—1906-1907.

Organized by the Automobile Club of France as an annual international speed contest to succeed the Bennett Cup race. Was designed to be contested in 1905, but was deferred until the following year. The rules differ from those of the Bennett race in two important particulars, viz., in permitting each maker (instead of each country) to enter three cars and in requiring all repairs to be made by the driver and his mechanician.

Competitions, Foreign (Continued)

The first contest was held on the Sarthe circuit (103 k.) on June 26 and 27, 1906. It lasted two days, on each of which six rounds of the circuit were made, a distance of about 618 kilometers.

Thirty-two cars started and at the end of the first day the results were as follows: 1st, Szisz (Renault), 5h. 45m. 30 2-5s.; 2nd, Clement (Clement), 6h. 11m. 40 3-5s.; 3rd, Nazzaro (Fiat), 6h. 26m. 53s.; 4th, Shepard (Hotchkiss), 6h. 30m. 45s.; 5th, Lebrun (Brasier), 6h. 31m. 48 1-5s.; 6th, Richez (Renault), 6h. 35m. 47s.; 7th, Heath (Panhard), 6h. 48m. 12s.; 8th, Tart (Panhard), 7h. 1m. 52 2-5s.; 9th, Lancia (Fiat), 7h. 12m. 19 1-5s.; 10th, Hemery (Darracq), 7h. 26m. 18 2-5s.; 11th, Rigolly (Gobron), 7h. 36s. 8 1-5s.; 12th, Mariaux (Mercedes), 7h. 39m. 31 1-2s.; 13th, Barras (Brasier), 7h. 41m. 43s.; 14th, Duray (de Dietrich), 7h. 58m. 46s.; 15th, Barillier (Brasier), 7h. 59m. 5s.; 16th, Jenatzy (Mercedes), 8h. 7m. 20s.; 17th, Rougier (de Dietrich), 8h. 15m. 55s.

The results of the second day were as follows: 1st, Szisz (105-hp. Renault), 12h. 14m. 7s.; 2nd, Nazzaro (135-hp. Fiat), 12h. 47m. 38 1-5s.; 3rd, Clement (125-hp. Clement-Bayard), 12h. 49m. 46 4-5s.; 4th, Barillier (110-hp. Brasier), 13h. 53m.; 5th, Lancia (135-hp. Fiat), 14h. 22m. 11s.; 6th, Heath (130-hp. Panhard), 14h. 47m. 45 2-5s.; 7th, Baras (110-hp. Brasier), 15h. 15m. 50s.; 8th, Duray (130-hp. de Dietrich), 15h. 26m. 1 3-5s.; 9th, Pierre (110-hp. Brasier), 16h. 15m. 7 3-5s.; 10th, Jenatzy-Burton (120-hp. Mercedes), 16h. 18m. 42 4-5s.; 11th, Mariaux (120-hp. Mercedes), 16h. 38m. 51 2-5s.

On July 2, 1907, the second Grand Prix race was run. The distance covered was 478 miles over what is known as the Dieppe course. Thirty-eight cars started the race and 16 of these finished in the following order: Nazzaro (Fiat), 6h. 46m. 33s.; Szisz (Renault), 6h. 53m. 10s.; Baras (Brasier), 7h. 5m. 5s.; Gabriel (De Dietrich), 7h. 11m. 37s.; Rigal (Darracq), 7h. 12m. 36s.; Cailliois (Darracq), 7h. 15m. 58s.; Barillier (Brasier), 7h. 27m. 54s.; Garcet (Bayard-Clement), 7h. 39m. 56s.; Hemery (Mercedes), 8h. 25m. 25s.; Courtade (Motobloc), 8h. 48m. 33s.; Bablot (Brasier), 9h. 12m. 59s.; Richez (Renault), 9h. 30m. 52s.; Degrais (Germain), 9h. 50m. 36s.; Brault (Germain), 10h. 10m. 48s.; Collomb (Motobloc), 10h. 24m. 57s. Fastest lap, 47.8 miles, Duray (De Dietrich), 37m. 54s. Of the first ten cars, 8 were French, 1 Italian and 1 (the tenth), German.

Competitions, Foreign (Continued) LIEDERKERKE (CUP).

This test of 428.57 km., reserved for touring cars, was run Aug. 14, 1906, the day following the circuit of Ardenes. The results were as follows: 1st, La Metallurgique (Wilhelm), in 5h. 27m. 28s.; 2nd, Germain (Perpere), in 5h. 29m. 51s.; 3rd, Minerva, in 5h. 39m. 49s.; 4th, Germain; 5th, La Metallurgique; 6th, Minerva; 7th, Pipe; 8th, La Metallurgique; 9th, Vivinus; 10th, Pipe.

MARSEILLES-NICE-MONTE-CARLO, 1897.

This test began Jan. 29, 1897, and was run really on the Marseilles-Nice-La Turbie route, in 3 days: 1st day from Marseilles to Frejus (148 km.); 2nd day from Frejus to Nice (68 km.); 3rd day from Nice to La Turbie (17 km.). Results: 1st, Chasseloup-Laubat (steam cars), 7h. 45m. 9s.; 2nd, Lemaitre (gasoline car), 8h. 17m. 27s.; 3rd, Prevost, 8h. 26m. 58s.; 4th, de Knyff, 9h. 5m. 14s.; 5th, E. Giraud, 9h. 24m. 23s.; 6th, Michelin, 9h. 35m. 50s. Motorcycles—1st, Chesnay, 9h. 23m. 36s.; 2nd, Marcellin, 9h. 40m. 53s.; Vicomte du Soulies, 9h. 46m. 18s.

MATIN (CUP OF).

Organized Aug., 1906, by the journal "Le Matin" as an automobile endurance test of 6000 kilometers, in 28 stages, through France. Of the 47 cars that started 32 returned. Following are the results: First, without penalization, sharing in the division of the prize of 25,000 francs constituting that of the "Le Matin" cup. Pellegrin (8-hp. de Dion-Bouton); Sire (12-hp. Darracq); Bardin (12-hp. Darracq); Paquette (12-hp. Cottureau); Didier (24-hp. de Dion-Bouton); Dunlop (16-hp. Bayard); Renaux (40-hp. Mercedes). Afterward came, likewise first, but not entitled to the prize, the competitors that had completed the stages, with the times of penalization. Herald, 33m.; de Dion-Bouton, 36m.; Darracq, 1h. 28m.; Contal II., 1h. 28m.; Bayard, 1h. 58m.; Darracq, IV., 13h. 7m.

MILAN, GOLD CUP OF—1906.

This Italian touring contest ended May 24, 1906, after 11 days, over a 3,938 km. course. The test was run in 28 stages, and the following were the results: 1st, Lancia (Fiat); 2nd, Maggioni (Zust); 3rd, Cagno (Itala); 4th, Nazzaro (Fiat); 5th, Boschis (Fiat); 6th, Macdonald (San Giorgio); 7th, Glenworth (San, Giorgio); 8th, Fraschini

(Isotta-Fraschini); 9th, Pfanz (Benz); 10th, Bossano (Benz); 11th, Vercellone (Diatto-A. Clement); 12th, Minora (Isotta-Fraschini); 13th, Colimet (Diatto-A. Clement); 14th, Fabry (Itala); 15th, Von Lude (Martini); 16th, Nagliati (de Dion-Bouton). Lancia won the Gold Cup plus a prize of 25,000 francs. Maggioni won the Automobile Cup of Milan and 6,000 francs. The Fiat team won the cup of the City of Milan.

MILITARY VEHICLES (COMPETITION OF).

This competition, which took place in July, 1905, gave the following results: 1st, Delahaye; 2nd, de Dion-Bouton; 3rd, Gillet-Forest.

MONT CENIS.

In 1905 the contests were held on July 16 and the results were as follows: Speed class, large cars—1st, Nazzaro (100-hp. Fiat), 19m. 18s.; 2nd, Cagno (Fiat); 3rd, Hemery (Darracq). Light cars—1st, Raggio (24-hp. Itala); 2nd, Biarh (Itala). Motorcycles—1st, Riva (Peugeot); 2nd, Maffies (Maffies); Reale (Peugeot). Tourists, large cars—1st, Weilschott (75-hp. Fiat), 23m. 6s.; Bigio (Itala). Light cars—1st, Graziana (Peugeot); 2nd, Picena (Peugeot). Light voitures—1st, Giraud (Panhard), 19h. 18m. 14s.; 2nd, Berteaux (Panhard-Levassor), 22h. 3m. 9s.; 3rd, Teste (Panhard-Teste), 22h. 3m. 41s. Motorcycles—1st, Osmont (de Dion), 18h. 50m. 10s.; 2nd, Barteaux, 20h. 35m. 39s.; 3rd, Cormier, 21h. 58m. 24s.

MONT VENTOUX.

In 1905 the results were as follows: Touring category—motorcycles—1st, Ruamps (Griffon), 27m. 9½s.; 2nd, Lamberjack (Griffon). Cars—1st, Rivierre (Cottureau); 1st, Giry (Svelt); 1st, Didier (La Buire); 1st, Mottard (La Buire). Speed category—1st, Lamberjack (Griffon), 25m. 48½s. Motorcycles—1st, De la Touloubre (Darracq). Light carriages—1st, Cagno (Fiat); 2nd, Rougier (de Dietrich).

At the meeting of Sept. 15 and 16, 1906, the following were the results. Tricars—1st, Bucquet, 1h. 8s.; 2nd, Bonneville (S. A. F.), 1h. 10m. 56s. Chassis of less than 4000 francs—1st, Fournier (Alcyon), 1h. 19m. 53.3-s. Chassis of less than 9000 francs—1st, Belleville (12-hp. Brouhot), 59m. 8.1-s.; 2nd, Comanos (Cottureau), 1h. 2m. 45.3-s. The record belongs to Rivierre (Cottureau), 59m. 6s. Tourists, chassis of from 9000

Competitions, Foreign (Continued)

to 14,000 francs—1st, Ladougue (Motobloc), 32m. 25s.; 2nd, Gasté (Radia), 35m. 59s.; 3rd, Aubert (Mieusset), 40m. 52s.; 4th, Jomain (Le Buire), 44m. 25s.; 5th, Rouget (Mieusset), 44m. 58s.; 6th, Larcheveque (La Buire), 45m. 51s.; 7th, Picherel (Darracq), 56m. 13s.; 8th, Simon (Mors), 1h. 2m. 4s.; 9th, Cote (Pilain), 1h. 3m. 12s. Motorcycles—1st, Giuppone, 26m. 58s. (record beaten); 2nd, Champoiseau (Alcyon), 30m. 63-5s.; 3rd, Cissac, 33m. 12 1-5s.; 4th, Escoffier (Magnat-Debon 1-3 litre), 35m. 46 1-5s.; 5th, Camoin (Alcyon-Buchet), 52m. 28 3-5s.; 6th, Sinde (Bruneau 1-3 litre), 1h. 4m. 52 2-5s. The second day the following were the results: Chassis of from 14,000 to 20,000 francs—1st, Mottard (La Buire), 25m. 52 2-5s. (record beaten by 7 minutes); 2nd, Fabre (Berliet), 26m. 38 2-5s.; 3rd, Bec (Martin), 35m. 53 2-5s. Chassis of more than 20,000 francs—1st, Taddeoli (Rochet-Schneider) 25m. 15s.; 2nd, Garcet (Bayard), 25m. 48 3-5s. Speed, motorcycles—1st, Camoin (Alcyon-Buchet), 1h. 23-5s. Cars—1st, Col lomb (Rochet-Schneider), 24m. 40s.

In 1907 the contest was run on Sept. 14 and 15, the first day being given over to motorcycles and touring cars. The distance from Bedoin, where the start was made, to the summit is 21.6 kilos., and the rise averages 9 per cent., the steepest part being near the top where it reaches 13 per cent. Following is the first day's summary: Speed class, motorcycles under 50 kilos.—1st, Griffon (Gauthier), 34m. 103-5s.; 2nd, Motosacoche (Jacquemod), 38m. 13-5s.; 3rd, Motosacoche (Bastiani). Touring classes—Class I.—Voiturettes, 1-cyl. 120 mm. bore, 2-cyl. 90 mm. bore, 4-cyl. 70 mm. bore; weight, 500 kilos—1st, Sizaire et Naudin (Sizaire) 43m. 27 3-5s.; 2nd, Sizaire et Naudin (Naudin). Class Ia.—Voiturettes, 1-cyl. 121-140 mm. bore—1st, Peugeot (Giuppone), 48m. Class II.—2-cyl. cars, 91-120 mm. bore, 4-cyl. cars, 71-80 mm. bore—1st, La Buire (Lachannay), 46m. 38 2-5s.; 2nd, Vermorel (Vermorel), 48m. 29 2-5s.; 3rd, Roy (Roy); 4th, Motobloc (Desgeorge); 5th, Lutece (Gachet). Class III.—4-cyl. cars, 81-90 mm. bore—1st, Brouhot (Belleville), 35m. 30 1-5s.; 2nd, Werner J. Herveu, 47m.; 3rd, Gregoire (Renounce). Class IV.—4 cyl. cars, 71-102 mm. bore—1st, Brouhot (Souchal), 31m. 58s.; 2nd, La Buire (Mottard), 31m. 58s.; 3rd, Cottin-Desgouttes (Aubert).

Following is the second day's summary: Speed class—Grand Prix cars—1st, Lorraine-Dietrich (Rougier), 19m. 30 2-5s.; 2nd, Brasier (Bablot), 19m.

Competitions, Foreign (Continued)

59 2-5s. Touring classes—Class V.—24-30-hp., 4-cyl. 103-116 mm. bore, weight, 1,100 kilos.—1st, Brouhot (Feuillet), 28m. 43-5s.; 2nd, La Buire (Kist), 28m. 11s.; 3rd, Brasier (Rivierre), 28m. 50s. Class VI.—30-40-hp., 4-cyl. 117-125 bore, weight, 1,150 kilos.—1st, Cottin et Desgouttes (Marze), 25m. 16 4-5s.; 2nd, Darracq (Metargy), 27m. 3s.; 3rd, Pilain (Chalandon), 27m. 32s.; 4th, Cottin et Desgouttes (Deydier), 28m. 18s. Class VIa.—30-40-hp. 123-129 bore—1st, Mors, (Hamelle), 28m. 22s.; 2nd, Roland-Pilain, (Pilain), 42m. 26s. Class VII.—40-60-hp. 123-140 bore, weight, 1,250 kilos.—1st, Radia (Gaste), 25m. 44 1-5s.; 2nd, La Buire (Mottard), 33m. 8s. Class VIII.—40-60-hp. 6-cyl.—1st, Rossel (Jenne), 24m. 54 4-5s.; 2nd, Rossel (Sahler), 27m. 23s.; 3rd, Aquila Italiana (Pichat).

PARIS-MARSEILLES-PARIS.—1896.

Held Oct. 1 and the days following in successive stages, viz: Out: Auxerre, Dijon, Lyons, Arignon, Marseilles. In: Arignon, Lyons, Dijon, Sens, Paris. Of the 30 competitors who started from Versailles only 28 left Auxerre, 16 Dijon, and 14 Lyon. These fourteen reached Paris in the following order: 1st, Panhard, 67h. 42m. 58s.; 2nd, Panhard, 68h. 11m. 5s.; 3rd, de Dion, 71h. 1m. 5s.; 4th, Panhard, 71h. 23m. 22s.; 5th, Michelin, 73h. 20m. 12s.; 6th, Peugeot, 75h. 26m.; 7th, Delahaye, 75h. 29m. 48s.; 8th, Peugeot, 81h. 23m. 51s.; 9th, de Dion, 83h. 43m. 16s.; 10th, Delahaye, 84h. 27m. 5s.; 11th, Maison Parisienne, 102h. 41m. 37s.; 12th, Maison Parisienne, 108h. 39m.; 13th, Landry and Beyvoux, 119h. 44m. 21s.; 14th, Michelin, 141h. 10m. 47s.

PARIS-DIEPPE—1897.

Organized by "Figaro" under the patronage of the Automobile Club of France, was held July 24, 1897. Distance, 170 k. Following were the results: Motorcycles—1st, Jamin (Bollée), 4h. 13m. 33s.; 2nd, Pellier (Bollée), 4h. 33m. 55s.; 3rd, Bertrand (de Dion), 4h. 48m. 12s. Cars (2-seat)—1st, Gilles-Hourgier (Panhard), 4h. 36m.; 2nd, Charon (Panhard), 4h. 38m. 31s.; 3rd, Prevost (Panhard), 4h. 48m. 12s. Cars (4-seat)—1st, de Dion (de Dion), 4h. 19m. 34s.; 2nd, Giraud (Panhard), 4h. 19m. 34s.; 3rd, Archdeacon (Delahaye), 5h. 41m. 15s. Cars (6-seat)—1st, D. Courtois (Delahaye), 5h. 58m. 13s.; 2nd, Doriot (Peugeot), 6h. 26m. 53s.

Competitions, Foreign (Continued) PARIS-THOUVILLE (170 km.).

Race organized by "Le Journal" under the patronage of the A. C. F. and run Aug. 14, 1897. Results: Cars—1st Jamin (Bollée voiturette), 3h. 48m. 56s. 2nd, Gilles-Hourgieres (Panhard-Levasor); 3rd, Lemaitre (Peugeot); 4th, A. de Dion (de Dion-Bouton).

PARIS-AMSTERDAM-PARIS.—1898.

This contest was divided into two classes, a speed and a touring. The touring class started from Paris July 5, and completed its itinerary in 10 stages. The speed contestants started July 7, and followed an itinerary that took in ten stages. In the speed class, out of the 43 contestants who started, 37 reached Chateau d'Ardenne and placed themselves under the orders of the starter the next day for the second stage. The following are the number that arrived at each stage. Paris-Chateau d'Ardenne, 7 out of 43 started; Chateau d'Ardenne-Nymègue, 33 out of 37; Nymègue-Amsterdam, 31 out of 33; Amsterdam-Liege, 29 out of 33; Liege-Verdun, 26 out of 29; Verdun-Paris, 23 out of 26. The arrival really took place at Montgeron, the authorities having forbidden the race in the department of the Seine. Following are the results: 1st, Charron, 33h. 4m. 34s.; 2nd, Girardot, 33h. 25m. 18s.; 3rd, Gandry, 34h. 8m. 58s.; 4th, de Knyff, 34h. 58m. 50s.; 5th, Loysel, 35h. 19m. 9s.; 6th, Adam, 35h. 45m. 57s.; 7th, Doriot, 36h. 20m. 47s.; 8th, Kraeutler, 38h. 26m. 55s.; 9th, Levegh, 38h. 41m. 2s.; 10th, Antony, 39h. 30m. 14s.; 11th, Chesnay, 43h. 58m. 40s.; 12th, Hourgieres, 46h. 50m. 19s.; 13th, Heath, 48h. 58m. 26s.; 14th, Dr. Pascal, 52h. 30m. 58s.; 15th, Vedrine, 57h. 27m. 5s.

PARIS-OSTEND—1898.

Organized by the Committee of the Exposition of the Kursaal of Ostende, and run August 31 in two stages, viz., Paris-Saint-Pol (186 km.) and Saint-Pol-Ostende (140 km.). Results: Cars—1st, Girardot and Levegh, dead-heat, in 6h. 11m.; 3rd, Lemaitre, in 6h. 22m.; 4th, Charron, in 6h. 39m.; 5th, Jenatzy, in 6h. 40m. Voiturettes—1st, Renault Brothers; 3rd, Renault Brothers. Motorcycles—1st, Barras, in 6h. 6m.; 2nd, Teste, in 6h. 10m.; 3rd, Corre, in 6h. 30m.; 4th, Bardin, in 7h. 28m.; 5th, Merville, in 7h. 23m.; 6th, Oury, in 7h. 20m.

Competitions, Foreign (Continued) PARIS-BORDEAUX—1899.

Held May 24. Organized by the Automobile Club of France. Distance, 565 k. There were 74 entries, of which 41 were motorcycles and 33 cars. Results: Cars—1st, Charron, in 11h. 43m. 29s.; 2nd, R. de Knyff, in 11h. 51m. 26s.; 3rd, Girardot, in 12h. 32m. 35s.; 4th, Archambault, in 12h. 37m. 45s.; 5th, Hourgieres, in 13h. 3m. 44s.; 6th, Antony, in 13h. 17m. 43s. Motorcycles—1st, Bardin, in 13h. 22m. 42s.; 2nd, Teste, in 13h. 20m. 30s.; 3rd, De Méaulne, in 13h. 44m. 35s.; 4th, Vasseur, in 14h. 56m. 35s.

In 1901, a second test, also organized by the Automobile Club of France, took place. The start was made on May 29. Following are the results: Cars—Fournier (Mors), 6h. 11m. 44 3-5s.; 2nd, Farman (Panhard), in 6h. 41m. 14-5s.; 3rd, Voigt (Panhard), 7h. 16m. 11 2-5s.; 4th, Pinson (Panhard), 7h. 46m. 51 4-5s. Light Cars—1st, Giraud (Panhard), 8h. 9m. 48 4-5s.; 2nd, Baras (Darracq), 8h. 42m. 52 2-5s.; 3rd, Edmond (Darracq), 10h. 25m. 4s. Voiturettes—1st, L. Renault (Renault), 9h. 32m. 27s.; 2nd, M. Renault (Renault), 9h. 40m. 14s.; 3rd, Oury (Renault), 9h. 46m. 50 1-4s. Motorcycles—1st, Teste (de Dion tricycle), 8h. 13-5m.; 2nd, Osmont (de Dion), 8h. 3m.; 3rd, Bardeaux (de Dion), 8h. 54m. 63-5s.

PARIS-BOULOGNE-SUR-MER—1899.

Held Sept. 17. Distance, 230 k. The start took place at Saint-Germain-en-Laye. Results: Cars—1st, Girardot, in 4h. 17m. 44s.; 2nd, Levegh, in 4h. 19m. 20s.; 3rd, Broc, in 4h. 32m. 50s.; 4th, Rolls, in 6h. 11m. 30s. Voiturettes—1st, Leuliette, in 7h. 9m. 4s.; 2nd, Lefebvre, in 7h. 33m. 15s. Motorcycles—1st, Baras, in 5h. 22m. 17s.; 2nd, Demester, in 6h. 13m. 20s.; 3rd, Osmontmeu, in 6h. 4m.; 4th, Lea Lemoine, in 6h. 24m. 40s.

PARIS-TOULOUSE-PARIS—1900.

Organized on the occasion of the Exposition of 1900 and run in three stages, beginning July 25, as follows: 1, Paris-Toulouse; 2, Toulouse-Limoges; 3, Limoges to Paris. The first stage was won by Levegh (Mors), in 13h. 13m. 25s.; the second by Voigt, in 5h. 43m. 49s.; the third by Pinson, in 6h. 44m. 18s.

The result of the entire course (1,348.75 km.) was as follows: Cars—1st, Levegh, in 20h. 50m. 9s.; 2nd, Pinson, 22h. 11m. 1s.; 3rd, Voigt, in 22h. 11m. 51s.; 4th, Giraud, in 22h. 55m. 32s.; 5th, Antony, in 26h. 46m. 27s.; 6th, Turckheim, in 37h. 35m. 36s.; 7th, Ravel, in 41h. 29m. Voi-

Competitions, Foreign (Continued)

turettes—1st, Renault, in 34h. 33m. 38s.; 2nd, Schrader and Oury, in 45h. 49m. 35s.; 3rd, Grus, in 57h. 25m. 43s. Motorcycles—1st, Teste, in 23h. 54m. 15s.; 2nd, Collignon, in 27h. 28m. 32s.; 3rd, Bardin, in 28h. 26s.; 4th, Gasté, in 30h. 32m. 30s.; 5th, Gleize, in 36h. 19m. 14s.

PARIS-BERLIN—1901.

Organized by the Automobile Club of France and run in three stages on June 27, 28 and 29, through Aachen and Hanover into Berlin, 1,200 k. Of 155 vehicles which started from Paris only 78 arrived at Aachen, 25 at Hanover and the same number reached Berlin before the control closed at 10 P. M. The roads were very dusty and the speed, averaging from 37 to 47 miles per hour for the whole race, accounted for the many mishaps which occurred. The race was won by Henri Fournier in the same 35-hp. Mors with which he won the Paris-Bordeaux race one month previously. The winning drivers and cars were as follows: 1st, Fournier (Mors), in 15h. 32m. 6s.; average per hour 71.1 k.; 2nd, Girardot (Panhard), in 16h. 38m. 38s.; 3rd, R. de Knyff (Panhard), in 15h. 40m. 24s.; 4th, Brasier (Mors), in 17h. 14m. 35s.; 5th, H. Farman (Panhard), 17h. 46m. 6s.; 6th, Charron (Panhard), in 18h. 20m. 57s. Light Cars—1st, Giraud (Panhard), in 19h. 18m. 14s.; 2nd, Berteaux (Panhard), in 22h. 3m. 9s.; 3rd, Teste (Panhard), in 22h. 3m. 41s. Voiturettes—1st, Louis Renault (Renault Frères), in 18h. 37m. 23s.; 2nd, Grus (Renault Frères), in 22h. 28m. 33s.; 3rd, L. Morin-Corre (Corre), in 29h. 4m. Motorcycles—1st, Osmont (de Dion), in 18h. 50m. 10s.; 2nd, Berteaux, in 20h. 35m. 39s.; 3rd, Cormier, in 21h. 5m. 24s.

PARIS-VIENNA—1902.

Organized jointly by the Automobile Club of France and the Automobile Club of Austria, and run June 26, 27, 28 and 29, in four stages, viz: 1st stage, Paris-Belfort, 415 km.; 2nd stage, Belfort-Bregenz, 327 km.; 3rd stage, Bregenz-Salsbourg; 4th stage, Salsbourg-Vienna. The second stage, which included the passage through Switzerland, was neutralized. Total distance, 1,415 k. The winning cars and drivers were as follows:

1st, H. Farman (Panhard), in 16h. 30 1-5s.; 2nd, Count Zborowski (Mercedes), in 16h. 13m. 29 3-5s.; 3rd, M. Farman (Panhard), in 16h. 19m. 29 2-5s.; 4th, Teste (Panhard), in 17h. 13m. 28 4-5s.; 5th, Pinson (Panhard), in 18h. 41 2-5s.; 6th, P. de Crawhez (Panhard), in 18h. 5m. 20 2-5s.; 7th, Chau-

Competitions, Foreign (Continued)

chard (Panhard), in 18h. 16m. 45 2-5s.; 8th, Edge (Napier), in 19h. 16m. 21 4-5s.; 9th, de Caters (Mors), in 19h. 54m. 58 1-5s.; 10th, G. de Crawhez (Panhard), in 20h. 6m. 36 2-5s. Light Cars—1st, Marcel Renault (Renault Frères), in 15h. 47m. 43s.; 2nd, Edmond (Darracq), in 16h. 10m. 16 1-5s.; 3rd, Barras (Darracq), in 17h. 4m. 52s.; 4th, Hemery (Darracq), in 17h. 23m. 38 3-5s.; 5th, Marcellin (Darracq), in 17h. 38m. 36 1-5s.; 6th, Tart (Clement), in 18h. 26m. 45 3-5s. Voiturettes—1st, Guilanme (Darracq), in 20h. 4m. 33s.; 2nd, Grus (Renault Frères), in 20h. 17m. 54 2-5s.; 3rd, Cormier (Renault Frères), 23h. 22m. 37 2-5s.; 4th, Durand (Corre), in 25h. 47m. 13 2-5s.; 5th, G. Rivierre (Richard), in 26h. 7m. 23 1-5s.

PARIS-MADRID—1903.

Last of the great inter-city races. It was planned to be run in three stages, as follows: First, May 22, from Versailles to Bordeaux (552 km.); second, May 26, from Bordeaux to Victoria (335 km.); third, May 27, from Victoria to Madrid. There were 314 vehicles entered. The race was stopped at the end of the first stage, as, on account of the numerous accidents that had occurred, the French and Spanish governments forbade its continuance. Marcel Renault was killed outright and a number of other fatalities and casualties to both contestants and spectators along the road occurred. They were due to the large number of cars in the race, to the great interest evinced in it and the consequent enormous crowds that gathered along the route through France, the lack of police or military protection and the reckless pace kept up by the participants in the race.

Results at the end of the first stage: Heavy cars—1st, Gabriel (Mors), 5h. 14m. 31 1-5s.; 2nd, Salleron (Mors), 5h. 47m. 14 5-5s.; 3rd, Jarott (de Dietrich), 5h. 52m. 55s.; 4th, Crawhez (Panhard), 5h. 54m. 11 2-5s.; 5th, Warden (Mercedes), 5h. 55m. 30 4-5s.; 6th, Voigt (C. G. V.), 5h. 57m. 49 1-5s. Light Cars—1st, L. Renault (Renault), 5h. 29m. 39 1-5s.; 2nd, Barras (Darracq), 6h. 20 4-5s.; 3rd, Page (Decauville), 6h. 20m. 8 1-5s.; (Darracq), 6h. 56m. 53 1-5s.; Pelisson (de Dion), 7h. 13m. 42 3-5s.; 6th, Thèry (Decauville), 7h. 24m. 16s. Voiturettes—1st, Masson (Clement), 7h. 14m. 45 1-5s.; 2nd, Barillier (Richard), 7h. 40m. 3-5s.; 3rd, Wagner (Darracq), 7h. 48m. 12 2-5s. Motorcycles—1st, Bucquet (Werner), 8h. 56m. 55s.; 2nd, Demester, 9h. 4m. 44 4-5s.; 3rd, Jollivet, 9h. 26m. 54 2-5s.

Competitions, Foreign (Continued) PARIS-BORDEAUX-PARIS (1905).

Held June 11, the distance being 1,200 km. The starting point was Versailles, and out of 40 cars entered, only 20 started. Nine vehicles finished in the following order: 1st, Panhard, in 48h. 47m.; 2nd, Peugeot, in 54m. 35s.; 3rd, Peugeot, in 59m. 48s.; 4th, Peugeot, in 59h. 59s.; 5th, Roger, in 64h. 30m.; 6th, Panhard, in 72h. 14m.; 7th, Panhard, in 78h. 7m.; 8th, Roger, in 82h. 48m.; 9th, Bollée steam omnibus, in 90h. 5m. A cash prize of 10,000 francs, donated by James Gordon Bennett and the Baron De Zuylen was divided among the winners as follows: 1st, 50 per cent.; 2nd, 20 per cent.; 3rd, 10 per cent., and the next four 5 per cent. each.

PYRENEES (CUP).

This test, organized by "La Depeche" of Toulouse and "La Vie au Grand Air," was run from the 20th to 27th of August, 1905. The results were: 1st, Sorel (de Dietrich); 2nd, Belleville (Brouhot); 3rd, Didier (de Dion-Bouton); 4th, Babinet (Berliet); 5th, Richez (Brouhot); 6th, Feuillet (Brouhot); 7th, Marechal (Brouhot); 8th, Coujet (Darracq); 9th, Sambucy (Rochet-Schneider); 10th, Cormier (de Dion-Bouton).

RHONE (COMPETITION OF THE AUTOMOBILE CLUB OF).

This competition, which took place July 14, 15 and 16, 1906, finished by the victory of Montville on a Brasier car. Following are the results of the various tests. Efficiency: Dead heat between Brasier and Pilain, both of whom obtained the maximum number of points, very closely followed by Rochet-Schneider with two cars. Regularity: Brasier and Rochet-Schneider obtained the maximum followed immediately by Pilain. Hill-climb: New dead heat between Brasier and Pilain. General results: 1st, Brasier (Montville), 300 out of 100 points; 2nd, Pilain (Chalands), 292.2 points; 3rd, Rochet-Schneider (Pierre), 270.37 points.

ROCHET-SCHNEIDER (CUP).

This test, which was founded in 1904 by the Automobile Club of the Rhone, was disputed June 4, 1906, upon the circuit of Auvergne, which was to be covered three times. It was won by Perret (Peugeot), who thus renewed his victory of 1905. Following were the results of the test: 1st, A. C. Perret (16-hp. Peugeot); 2nd, Guyaille (20-24-hp. Bayard-Clement); 3rd, Desson (18-hp. Rochet-Schneider); 4th, Bergmann (20-24-hp. Bayard-Clement).

Competitions, Foreign (Continued) SAINT GOTHARD (COMPETITION OF).

August 26, 1906.—Circuit: Lugano-Airolo-Lugano, in the mountainous regions of Saint Gothard. The results were as follows. Four-cylinder Cars: Friedlanzer (Zust), in 9h. 3m.; Soldati (White); Comi (Benz); Salvioni (Rapid); Popp (Diatto-Clement); Morel (Bayard).

SEMMERING HILL (AUSTRIA).

The 1905 contests were held Sept. 17. The hill is 10 k. long with a rise of 8 to 12 per cent. Following are the results: Speed, light motorcycles—1st, Wondrich (Laurin-Klement). Motorcycles—Wetzlia (Puch). Cars—Braun (100-hp. Mercedes), 7m. 50.4-5s.; winning the challenge cup and beating the record. Touring: In each category—1st, Zeitlinger (Peugeot); 1st, Arnold (Mercedes); 1st, Hieronymus (Spitz); 1st, Mueller (Mercedes); 1st, Braun (Mercedes).

In 1906, held Sept. 23, the results were as follows: Light motorcycles—1st, Wezka (Puch), 10m. 13s. Voiturettes—1st, Yerns (Darracq), 8m. 46s. Touring cars—1st Category (Cyl. 1½ litre); 1st, Slevogt (Laurin-Klement), 17m. 26s.; 2nd, Kollatz (Laurin-Klement), 17m. 35.2-5s.; 3rd, Joerns (Darracq), 19m. 16s. 2nd Category (Cyl. 2½ litres)—1st, Benschlag (Opel-Darracq), 15m. 20s.; 2nd, Loeffler (Peugeot), 17m. 26s.; 3rd, Klincka (de Dion), 18m. 10s. 3rd Category (Cyl. 3½ litres)—1st, Julius Milch (Bock and Hollaender), 14m. 23.2-5s.; 2nd, Monson (Darracq), 14m. 44.3-5s. 4th Category (Cyl. 6 litres)—1st, Erle (Benz), 9m. 56s.; 2nd, Hieronymus (Spitz), 10m. 18s. 5th Category (Cyl. 8½ litres)—1st, Deplus (Pipe), 10m. 14.4-5s.; 2nd, Opel (Darracq), 10m. 15s.; 3rd, Seidl (Mercedes), 10m. 44.4-5s. 6th Category (Cyl. more than 8½ litres)—1st, Braun (Mercedes), 8m. 44.4-5s.

TARGA FLORIA (CUP)—1905-1911.

This cup, offered by Chevalier Florio and reserved for motor-cars of 1,000 kilograms at a maximum is to be put up for competition for seven years (1905-1911). After this it will become the property of the house that gains the greatest number of victories in the annual tests. In 1905 22 cars started. The results were as follows: 1st, Raggio (Itala), 4h. 46m. 47.2-5s.; 2nd, Duray (de Dietrich), 4h. 55m. 20s.; 3rd, Lancia (Fiat); 4th, Hemery (Darracq); 5th, Rougier (de Dietrich); 6th, Nazzaro (Fiat); 7th, Fabry (Itala); 8th, Wagner (Darracq).

Competitions, Foreign (Continued)

In 1906 (May 6), only 10 cars started, the results being as follows: 1st, Cagno (Itala), 9h. 32m. 20s.; 2nd, Grazziana (Itala), 10h. 5m. 8s.; 3rd, Bablot (Berliet), 10h. 25m. 5s.; 4th, Rigal (Itala), 10h. 25m. 8s.; 5th, de Caters (Itala), 10h. 38m. 26s.; 6th, Le Blon (Hotchkiss), 12h. 9m. 23s.

In 1907 the race was run on April 21. The cars ran three times over a 92-mile circuit, making a total of 276 miles. There were 45 cars to start and 28 finished in the following order: Nazzaro (Fiat), 8h. 17m. 36s.; Lancia (Fiat), 8h. 29m. 29s.; Fabry (Itala), 8h. 32m. 40s.; Duray (Lorraine-Dietrich), 8h. 39m. 7s.; Cagno (Itala), 8h. 39m. 16s.; Gabriel (Lorraine-Dietrich), 8h. 39m. 46s.; Tamagni (Isotta-Fraschini), 8h. 41m. 45s.; Weillschott (Fiat), 8h. 42m. 52s.; Sorel (Isotta-Fraschini), 8h. 52m.; Garcet (Bayard-Clement), 8h. 53m. 14s.; Minoia (Isotta-Fraschini), 8h. 53m. 19s.; Maggioni (Zust), 9h. 0m. 7s.; Isan (Deluca-Daimler), 9h. 1m. 22s.; Dureste (Gobron), 9h. 10m. 24s.; Erle (Benz), 9h. 11m. 15s.; Gremo (Junior), 9h. 13m. 38s.; Spagmann (Benz), 9h. 15m. 56s.; Buzio (Diatto-Clement), 9h. 20m. 5s.; Gauderman (Bayard-Clement), 9h. 29m. 4s.; Hubertot (Deluca-Daimler), 9h. 32m. 20s.; Collinet (Bayard-Clement), 9h. 38m. 25s.; Gallina (Rapid), 9h. 50m. 10s.; De Bojario (Benz), 9h. 52m. 40s.; Hemery (Deluca-Daimler), 10h. 16m. 20s.; Capuggi (Zust), 10h. 32m. 30s.; Gaste (Radia), 10h. 33m. 25s.; Fare (Gobron), 11h. 17m. 25s.; Pizzagalli (Pilain), 11h. 21m. 53s. The average speed was 53.83 kilometers per hour.

TOUR OF FRANCE—1889.

Organized by Le Matin, under the control of the Automobile Club of France, and held July 16 to 24, in seven stages, viz: 1, Paris-Nancy; 2, Nancy-Aix-les-Bains; 3, Aix-les-Bains-Vichy; 4, Vichy-Perigueux; 5, Perigueux-Nantes; 6, Nantes-Cabourg; 7, Cabourg-Paris. Out of 49 starters 21 vehicles finished, as follows: Cars—1st, R. de

Competitions, Foreign (Continued)

Knyff (Panhard), 44h. 43m. 39½s.; 2nd, Girardot (Panhard), 49h. 37m. 39 2-5s.; 3rd, Chasseloup-Loubat (Panhard), 49h. 44m. 18s.; 4th, Voigt-Pinson (Panhard), 52h. 34m. 17 4-5s.; 5th, Boileau du Castelneau (Bollée); 6th, Heath (Panhard), 58h. 46m. 55s.; 7th, Clement (Panhard), 75h. 45m. 35 3-5s.; 8th, Levegh (Mors), 80h. 14m. 59 2-5s.; 9th, Jenatzy (Mors), 166h. 6m. 3s. Motorcycles—1st, Teste (de Dion-Bouton), 50h. 58m. 9 2-5s.; 2nd, Tart (de Dion-Bouton), 51h. 32m. 37s.; 3rd, G. de Meaulne (de Dion-Bouton), 53h. 38m. 42s.; 4th, Degrais (de Dion-Bouton), 56h. 7m. 5 2-5s.; 5th, Bardin (de Dion-Bouton), 56h. 7m. 5 2-5s.; 6th, Beconais (Aster), 56h. 30m. 34 3-5s.; 7th, Gleize (de Dion-Bouton), 58h. 49m. 14 2-5s.; 8th, Cormier (de Dion-Bouton), 71h. 30m. 35s.; 9th, Rivierre (de Dion-Bouton), 93h. 44m. 44s. Voiturettes—1st, Gabriel (Decauville), 67h. 15m. 35 2-5s.; 2nd, Théry (Decauville), 75h. 43m. 22 4-5s.; 3rd, Aubin-Ulmann (Decauville), 125h. 25m. 4s.

TOURISTS' TROPHY—1905-1906.

This contest, organized by the Automobile Club of Great Britain, was conducted on the Isle of Man in 1905, over a 335 k. (about 208 miles) course. There were 51 entries. Following are the results: 1st, Arrol-Johnston (Napier), 6h. 9m. 14 3-5s.; 2nd, Rolls-Royce (Napier), 6h. 11m. 23s.; 3rd, Vinot-Deguingand (Littlejohn), 6h. 14m. 35 2-5s.; 4th, Arrol-Johnston (Roberts), 6h. 56m. 58 3-5s.; 5th, Rover (Courtis), 6h. 43m. 53 3-5s.; 6th, (Swift), 7h. 1m. 12 2-5s. Only 20 competitors finished the race.

In 1906 the contest was held on Sept. 27. An English car was winner, while France, with three representatives, took second, third and fourth places. The results: 1st, C. S. Rolls (Rolls-Royce), 4h. 6m.; 2nd, Bablot (Berliet), 4h. 32m. 58 1-5s.; 3rd, A. Lee-Guinness (Darracq), 4h. 42m. 48 1-5s.; 4th, G. Dumont (Clement), 4h. 47m. 20s.

Aeronautics

BENNETT CUP BALLOON RACE, 1906.

The first annual balloon contest for the Gordon Bennett Cup started from the Garden of the Tuileries, Paris, Sept. 20, 1906. Sixteen balloons started, and seven of these crossed the channel and landed in England. The cup went to the American representative, the result being as follows: 1st, Lieut. F. P. Lahm (America), landed near Scarborough, 645 km.; 2nd, A. Vonwiller (Italy), landed at New Holland, 575 km.; 3rd, Count de la Vaulx (France), landed at Walsingham, 470 km.

BENNETT CUP BALLOON RACE, 1907.

The second annual balloon contest for the Bennett cup started from St. Louis, Mo., Oct. 21, the event being held in America as a result of Lieut. Lahm's winning of the cup the year previous. Three countries—America, France and Germany—were represented by nine balloons, the cup being won by Germany. The crew of the Pommern sailed east as far as the Atlantic coast, and undoubtedly would have gone farther had it not been for the ocean. Following is the order of finish: 1st, "Pommern" (Germany), Oscar Erbsloch, landed at Asbury Park, N. J., 876

miles; 2nd, "Isle de France" (France), A. La Blanc, Herbertsville, N. J., 874 miles; 3rd, "Dusseldorf" (Germany), Hugo Abercron, Little Creek, Del., 780 miles; 4th, "America" (America), Chas. De F. Chandler, Patuxent, Md., 720 miles; 5th, "Anjou" (France), Rene Gassnier, Armenius Mines, Louisa County, Va., 700 miles; 6th, "Tschudi" (Germany), Paul Meckel, Manassas, Va., 680 miles; 7th, "United States" (America), Major H. B. Hersey, Hamilton, Ont., 650 miles; 8th, "St. Louis" (America), Alan Hawley, Westminster, Md., 632 miles; 9th, "Lotus II." (England), G. Brewer, Sabina, O.

CIRCULAR KILOMETER AIRSHIP RECORD TRIAL.

On Monday, Jan. 13, 1908, at Issy-les-Moulineaux, France, Henry Farman, in his heavier-than-air flying machine accomplished a flight of one kilometer in a closed circuit without touching ground. His performance won for him a prize of \$10,000 offered by M. Deutsch de la Meuthe and M. Ernest Archdeacon, to the inventor of a flying machine who should first accomplish a flight of one circular kilometer. Farman's time was 1m. 28s. and his average elevation was between four and six meters from the ground.

Horse Power and Prices of 1908

Cars and Chassis Produced

In All Countries

(Prices in country where produced given in dollars)

AMERICA		Price of 1908 steam cars.							
NAME OF CAR	HP	10	16	20	20-25	25	30	30-40	40
Clark		5000	....	....	....	....	....
Johnson		2500	....	....
Lane		2000	....	....	3500	....	....
Ross		2800	....	....	3500
Stanley		2500	....	....	....	....	....	....	....
White		2500	....	....	3700	....	....
GREAT BRITAIN		Price of 1908 steam cars.							
Bolsover		1175	....	....	....	....	....	....	....
E. J. Y. R.		2875	....
Fawcett-Fowler		3750	....	....	....	....
Turner-Miesse		2250	3250	....	....	....	3500	....	....

AMERICA	Price of 1908 electric cars (pleasure).				
Babcock	1700	1800	4000	....	....
Baker	1850	2000	2500	3000	4000
Byrider	1800	....	....	....	....
Columbia	1600	4000	....	....	....
Columbus	1650	1700	1950	2200	2550
Detroit	Price on application				
Fritchle	2000	....	....	....	....
Lansden	2250	....	....	....	....
Pope-Waverley	1475	1500	1600	1900	....
Rauch & Lang	1850	2400	3000	4000	....
Studebaker	950	1250	....	....	....
Woods	2100	2700	....	....	....
AMERICA	Price of 1908 electric cars (commercial).				
Baker	Price on application				
General Vehicle	Price on application				
Lansden	2300	3350	....	....	....
Pope-Waverley	1800	....	....	....	....
AUSTRIA	Price of 1908 electric chassis.				
Mercedes	4000	....	....	....	....
GREAT BRITAIN	Price of 1908 electric chassis.				
B. E. C. Electromobile	2375	....	....	....	....

AMERICA	Price of 1 cylinder 1908 commercial cars (gasolene).														
	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
Cadillac	1000														
Gaeth			1500												
Hewitt		1600													
Price of 2 cylinder 1908 commercial cars (gasolene).															
Brush			800												
Continental				1250											
Coppock					2500										
Knox						2800									
Logan	1000														
Meiselbach										2000					
Rapid							1550				2400				
Waltham	650			1425											
Weeks					1500										
Price of 4 cylinder 1908 commercial cars (gasolene).															
Auto Car Equipment Co. Three-Ton Truck													3250		
Chase													3500		
Commerce												3500		5000	
Couple-Gear			4500												
Frayser-Miller						3000									
Hewitt										4500					
Knox												4200			
Logan						1800							3500		
Manhattan														3800	
Mitchell						2000									
Savers & Scovill								2500							
Price of 6 cylinder 1908 commercial cars (gasolene).															
Auto-Car Equipment															6500

Gasolene Cars and Chassis

NAME OF CAR	Price of 1 cylinder 1908 complete cars.								
	4 H. P.	4½ H. P.	5 H. P.	6 H. P.	6½ H. P.	7 H. P.	8 H. P.	9 H. P.	10 H. P.
AMERICA									
Brush	500	....	....	....	....	....
Cadillac	850
Hewitt	1000
Monarch	300	....	....	....	....	....	....
Reo	650	....	....
Success	450	....	....	....	....	....	....	....	....
Waltham	400	....	....	....	....	....	....	....	....
FRANCE									
	Price of 1 cylinder 1908 chassis. * Price with body.								
Alcyon	790	....
Barré	914	....	....	....	....	....
Bozler	790	....	....
Chameroy	540	....	620	....	....	....	....	....
Chenard-Walcker	*900	....	....
Clesse	*620	*810	....
Corre	1040	....	....
Cottureau	750	900	....
Darracq	*760	....	....	....
de Dion-Bouton	1020	....	....
Delage	620	....	740	....	....	830	1020	....
Demeester	*700	....	....
Dorey	700	....	....	*900	....	....
Eclair-Helbé	620	....	780	....	....	900	....	....
Eureka	700	....	....	....	....	....
Fouillaron	790	....	....	950	....	....
Gauloise (La)	730	....	....
Guillemin	990	....
Hanriot	570	....	....
Hurtu	488	....	....	....	....	800	....	....
Lacoste-Battman	*500	....	608	....	....	710	....	....
Le Métais	*900	....	....
Lion-Peugeot	*1000	....	....
Morisse S. E. M.	*460	....	....	....	....	850	....	....
Orel	*590	*660	....	....
Passe-Partout	910	....	....
Peugeot	1000	....
Prima	580	....
Rolling (Dupressoir)	600	....	....	720	....	....
Roussel	*540	....	740	....	....	850	....	....
Sizaire et Naudin	*790	*1070	....
Steel	600	....	....

YEAR BOOK 1908—INTERNATIONAL MOTOR CYCLOPAEDIA

FRANCE		Price of 1 cylinder 1908 Chassis. * Price with body—Continued.								
NAME OF CAR		4 H. P.	4½ H. P.	5 H. P.	6 H. P.	6½ H. P.	7 H. P.	8 H.P.	9 H.P.	10 H.P.
Stimula		*780	....	....
Truffault		570	....	....
Vauselle		780	....	....
Vulpès		*840	....	....	....	*1040	....
GREAT BRITAIN		Price of 1 cylinder 1908 complete cars.								
Clyde		675	....	....	....	....
Horley		1525
Lotis		1125	....	....
Rover		650	....	....	1050	....	....
Starling		750	....	....

AMERICA		Price of 2 cylinder 1908 complete cars.																								
		NAME OF CAR	7	8	8½	8-10	9	9-10	10	10-12	11	12	12-14	12-15	12-18	14	15	16	16-20	18	18-20	20	22	22-24	24	24-28
	Albany	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	600	.....	.....	.....	.....	.....	.....	.....
	Atlas	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1400	.....	.....	.....	.....
	Auburn	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1350	.....
	Aurora	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	775	.....	.....	.....	.....
	Autocar	.....	.....	.....	.....	.....	.....	.....	.....	.....	1200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Bugmobile	.....	.....	.....	.....	.....	.....	.....	.....	.....	750	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Buick	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1250	.....	.....	.....
	Cartcar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1350	.....	.....
	Compound	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Continental	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Cosmopolitan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Duer	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Earl	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Economy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Everybodys	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Fulton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Hatfield
	Holsman
	Jackson
	Jewel
	Kato
	Kiblinger
	Lambert
	Luverne
	Mason
	Maxwell
	
	
	
	
	
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AMERICA—Continued		Price of 2 cylinder 1908 complete cars—Continued.																							
	NAME OF CAR	7	8	8½	8-10	9	9-10	10	10-12	11	12	12-14	12-15	12-18	14	15	16	16-20	18	18-20	20	22	22-24	24	24-28
	Meir	...	...	...	...	...	...	...	...	...	575	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Model	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1250	...
	Morse	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1500	...	...	...	...	...	...	...
	Moline	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1250	...	...	...	...	...	...	...
	Northern	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1600	...
	Oakland	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1400	...	...	...
	Postal	...	...	...	...	...	...	...	...	...	500	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rambler	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1400	...	...	...
	Reeves	...	...	...	...	...	...	750	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Reliable-Dayton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	780	...	...	...	...	...	...	...	...	...
	Reo	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1000	...	...	...	...	...
	Russell	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1600	...	...	...	...	...	...
	Schacht	...	...	...	...	...	...	...	...	...	680	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Single Center Buggy	...	...	...	...	...	...	...	...	...	...	...	675	...	...	...	...	...	...	...	...	...	...	...	...
	Staver	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1000	...	...	...
	Tourist	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1250	...	...
	Victor	...	...	...	...	...	...	...	...	575	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Waltham	...	600	...	...	...	...	...	...	...	...	...	...	...	...	1350	...	...	...	...	...	...	...	...	...
AUSTRIA		Price of 2 cylinder 1908 chassis.																							
	Taurin-Klement	700	820	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
BELGIUM		Price of 2 cylinder 1908 cars.																							
	Metallurgique	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

FRANCE		Price of 2 cylinder 1908 chassis. * Price with body.																							
NAME OF CAR		7	8	8½	9	9-10	10	10-12	11	12	12-14	12-15	12-18	14	15	16	16-20	18	18-20	20	22	22-24	24	24-28	
Alcyon		...	...	...	...	...	1040	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arlès		...	*900	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Barré		...	...	...	...	...	...	...	...	*1312	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bayard-Clément		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bazelaine (de)		960	...	...	...	...	...	...	...	1140	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bozler		...	...	...	...	...	1280	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Brouhot		...	...	...	1300	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Corre		...	...	...	...	...	1280	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cottureau		...	...	...	...	...	...	...	...	1000	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Darraoq		...	*1000	...	...	...	1260	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delage		...	...	...	...	...	1220	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delaugère-Clayette		...	1300	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eureka		...	...	...	...	...	...	...	...	900	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Foullaron		...	...	...	...	...	...	...	...	1380	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Grégoire		*795	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hurtu		...	1000	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jean Bart		...	...	...	...	...	1000	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lacoste et Battman		...	...	...	...	...	1006	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Legros (Péné)		...	716	...	...	...	...	...	...	1220	...	...	...	1400	...	...	...	...	...	...	...	...	...	...
Le Métais		940	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
I ethimonier		1200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Louet		...	...	...	...	...	1100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Obus		500	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Paroula		...	*500	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peugeot		...	...	...	...	...	1460	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Prod'homme		...	...	...	...	...	...	...	...	780	...	...	...	...	...	...	...	...	...	...	...	...	...	...

FRANCE—continued		Price of 2 cylinder 1908 chassis. * Price with body—Continued.																							
NAME OF CAR		7	8	8½	9	9-10	10	10-12	11	12	12-14	12-15	12-18	14	15	16	16-20	18	18-20	20	22	22-24	24	24-28	
Prunel et Dumas		...	...	...	...	...	...	1360	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Renault frères		...	1180	...	...	...	...	1560	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rolling		640	...	...	380	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sautter-Harlé		...	...	...	...	...	...	1460	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tourand		...	...	...	...	...	...	1080	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Unic		...	...	...	...	...	...	*1400	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vulpés		...	...	...	...	...	...	1100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Werner		*720	*920	...	...	...	...	*1160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
GERMANY		Price of 2 cylinder 1908 cars.																							
Adler		...	...	...	...	...	1050	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Autognome		600	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
GREAT BRITAIN		Price of 2 cylinder 1908 chassis. * Price with body.																							
Bentall		...	...	...	...	*1650	...	...	...	*1350	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Clyde		...	...	...	*1000	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hallamshire		...	...	...	...	...	...	...	*1175	...	*1525	...	...	...	...	...	...	...	...	...	...	...	...	...
Horley		...	...	*625	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hornet		...	...	...	*950	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iden		...	...	...	...	...	...	...	...	*1375	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lanchester		...	...	...	...	...	...	...	...	*1750	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Londonia		...	...	...	*1300	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lotis		...	...	...	...	...	...	...	*1375	...	...	...	1550	...	...	...	...	...	...	...	...	...	...	...
N. E. C.		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*2500	...	...	...	...
Northern		...	...	...	...	...	...	1200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phoenix		...	*700	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Premier		...	...	...	...	...	...	...	...	*1000	...	...	...	...	...	...	...	...	...	...	...	...	...	...

GREAT BRITAIN—Cont'd		Price of 2 cylinder 1908 chassis. * Price with body—Continued.																							
NAME OF CAR		7	8	8½	8-10	9	9-10	10	10-12	11	12	12-14	12-15	12-18	14	15	16	16-20	18	18-20	20	22	22-24	24	24-28
Riley		.....	.....	.....	.....	*840	.....	.....	.....	.....	.....	.....	.....	*1235	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sabella		.....	.....	.....	.....	.....	*920	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scout		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*1425	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Siddeley		.....	.....	.....	.....	.....	.....	*1500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Singer		*1075	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Star		.....	.....	.....	.....	*1100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Starling		.....	.....	.....	.....	.....	.....	*1000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Swift		.....	.....	.....	.....	.....	.....	.....	.....	*1125	.....	.....	.....	*1325	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Talbot		.....	.....	.....	.....	.....	.....	*1700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Thames		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*1600	.....	.....	.....	.....	.....	.....	.....	.....	.....
Valveless		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*1975	
Vulcan		.....	.....	.....	.....	.....	.....	*1300	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chambers (Ireland)		.....	.....	.....	.....	.....	.....	*1160	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Albion (Scotland)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	*2200	.....	.....	.....	.....	.....	.....	.....	.....
ITALY		Price of 2 cylinder 1908 chassis.																							
Otav		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rapid		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
AMERICA		Price of 3 cylinder 1908 complete cars.												Price of 3 cylinder 1908 chassis.											
NAME OF CAR		8-11	12-14	24	34	FRANCE								Price of 3 cylinder 1908 chassis.								Price of 3 cylinder 1908 complete cars.			
Atlas		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Elmore		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
														GREAT BRITAIN								Price of 3 cylinder 1908 complete cars.			
														Clyde								..... 1250			

		Price of 4 cylinder 1908 complete cars, 8-15 h. p. to 26 h. p.																									
AMERICA	NAME OF CAR	8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	26
	American Mors	.....	.....	.....	.....	.....	.....	.....	3500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Berliet	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6000	.....	.....	.....	.....	.....
	Buick	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	850	.....	.....	.....	.....	.....	.....	.....	.....	.....	2000	.....
	Cadillac	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2000	.....
	Cameron	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	850	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Dragon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Earl	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Ford	.....	.....	.....	.....	.....	.....	.....	.....	.....	600	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Frayer-Miller	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Great Smith	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Hay-Berg	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Hol-Tan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Knox	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Locomobile	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Logan	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Marion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Maryland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Maxwell	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Mitchell	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Moline	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Mora	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Napier	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Overland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Payne-Modern	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Premier	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Selden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

AMERICA—Continued		Price of 4 cylinder 1908 complete cars, 8-15 h. p. to 26 h. p.—Continued.																									
NAME OF CAR		8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	26
Senator		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stevens-Duryea		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stoddard-Dayton		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Thomas (Town car)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U. S. Runabout		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waltham		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wolfe		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
York-Pullman		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
AUSTRIA		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p.																									
Laurin-Klement		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
BELGIUM		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body.																									
Belgica		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
F. N. Herstal		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Germain		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Metalurgique		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miesse		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Minerva		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nagant-Hobson		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
FRANCE		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p.																									
Alcyon		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ampère		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arès		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Baselaise de		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barré		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

FRANCE—Continued		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body—Continued.																											
NAME OF CAR		8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	26		
Bayard-Clément		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Béatrix		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Berliet		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Bollée (Léon)		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Brasier		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Brouhot		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Burlat		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Charron		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Chenard-Walcker		1500	1740	1740	1740	1960	1960	1960	1960	2100	2100	2100	2100	2100	2100	2200	2200	2640	2640	2640	2640	2640	2640	2640	2640	2640	2640		
Clément-Gladiator		1620	1700	1700	1700	2000	2000	2000	2000	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400		
Cleese		990	990	990	990	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080		
Cornilleau-Sainte-Beuve		2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300		
Corre		1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600		
Cottareau		1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700		
Cottin-Desquottes		2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100		
Darracq		1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780	1780		
Decauville		1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960		
De Dion Bouton		1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640	1640		
Delage		1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460		
Delaugère-Clayette		1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Delaunay-Belleville		2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400		
Demeester		1160	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200		
Duhanot		1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300		
Eclair (l') Heibé		1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200		

FRANCE—Continued	Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p.—Continued.																									
	8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	28
Eudelin	1900	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Foullaron
Frangar
Gauloise (La)
G. E. M.
Gillet-Forest
Gobron-Brillé
Grégoire
Guillemin
Henriot
Hotchkiss
Hurtu
Jean-Bart
Labor
La Buire
Lacoste-Battman
Lavo (Energie Electro Mécan)
Legros (Réné)
La Métais
Lechimonnier
Lorraine-Dietrich
Louet
Luc Court
Marvel
Miléd-Gallardet

Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body—Continued.

FRANCE—Continued																											
NAME OF CAR		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body—Continued.																									
		8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	26
Moreny		1500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morisse		1350	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mors		1700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Motobloc		1960	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Niclausse	
Orel		*1100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ours	
Panhard-Levassor	
Passé-Partout	
Pax	
Peugeot	
Pilain	
Porthos	
Prima	
Prod'homme	
Prunel-Dumas	
Rebour	
Regina-Dixi	
Renault Frères	
Rex	
Rochet-Schneider	
Rolland-Pilain	
Rolling (Dupres-solr)	

FRANCE—Continued		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p.—Continued.																									
NAME OF CAR		8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	26
Rosell		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2360	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Roy (Georges)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Roy (Pierre)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	910	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sautter-Harlé		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
S. C. A. R.		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
S. F. A.		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steel		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tourand		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unic		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vauselle		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vernorel		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vinot-Degulingand		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Werner		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Westinghouse		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weyer-Richemond		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
GERMANY		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body.																									
Adler		2185	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Horch		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mercedes		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Opel		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Regent		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

GREAT BRITAIN		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body.																									
NAME OF CAR		8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	28
Academy										*2125																	
Alldays						*1625																					
Ariel-Simplex																											
Atalanta																	2750										*2750
Austin																*2325											
Bedminton																	1750										
Bell																											
Belsize																											
Bentall																											
Calthorpe																											
Clyde																											
Courier																											
Deasy																											
Dennis																											
Empress																											
Enfield																											
Gladiator																											
Hallamshire																											
Hillman-Coatalen																											
Horblck																											
Humber																											
Iden																											
Iris																											
James Brown																											
Lanchester																											
Lindsey																											

Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body—Continued.																											
8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	26		
Londonia															1575												
Maudslayi																								2875			
Nameless					1480																						
Napier													2750														
Northern														1825													
Osterfield														2250													
Owen															1750												
Pick		825																									
Premier										2000																	
Pullcar					2375																						
Rothwell						1750								1875							2875						
Rover														2250													
Roydale														2500											2750		
Scout								1975						2500													
Shamrock														2500													
Siddeley						1900								2875													
Simms-Walbeck																											
Singer																											
Speedwell																											
Star																											
Straker-Squire																											
Sunbeam																											
Swift																											
Talbot																											
Thames																											
Thorncroft																											

GREAT BRITAIN—Cont'd		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body—Continued.																									
NAME OF CAR		8-15	10	10-15	12	12-16	14	14-16	14-18	14-20	15	15-20	16	16-20	16-25	18	20	20-22	20-24	20-25	20-30	22	24	24-28	25	25-30	26
Vauxhall		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vulcan		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weigel		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Aster		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Withers		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chambers (Ireland)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alblon (Scotland)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Argyll (Scotland)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Drummond (Scotland)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Arrol-Johnston (Scotland)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
HOLLAND		Price of 4 cylinder 1908 complete cars, 8-15 h. p. to 26 h. p.																									
Spyker		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ITALY		Price of 4 cylinder 1908 chassis, 8-15 h. p. to 26 h. p. * Price with body.																									
Blanchi		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fiat		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florentia		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hisa		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Isotta-Fraschini		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Junior		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marchand		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Otav		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Palania		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rapid		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scat		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[illegible]

Price of 4 cylinder 1908 complete cars, 26-32 h. p. to 70-80 h. p.																											
26-32	28	28-35	30	30-35	30-40	32	35	35-40	38	38-45	40	40-45	40-50	40-80	45	45-50	46	48	50	50-55	50-60	60	70-80				
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AMERICA—Continued		Price of 4 cylinder 1908 complete cars, 26-32 h. p. to 70-80 h. p.—Continued.																								
NAME OF CAR		26-32	28	28-35	28-36	30	30-35	30-40	32	35	36-40	38	39-45	40	40-45	40-50	40-50	45	45-50	46	48	50	50-55	50-60	60	70-80
Franklin		2850																								
Frayer-Miller																							3500			
Frontenac															4000											
Gaeth											3690															
Garford														4000												
Gearless																							3250			3500
Gilde																5000										
Great Arrow						4000									3000											
Grout						3500																				
Halladay																										
Haynes												3000														
Heine-Velox						2500													3000							3750
Imperial																										
Iroquois						2500																				
Jackson																										
Jenkins																										
Jewel																										
Kisselkar																2000										
Kli						2000																				
Knox						2700																				
Lambert																										
Locomobile																										
Lorraine																										
Lorier																										
Marmon																										
Matheson																										

AMERICA—Continued	Price of 4 cylinder 1908 complete cars, 26-32 h. p. to 70-80 h. p.—Continued.																						
	NAME OF CAR	26-32	28	28-35	30	30-35	32	35	35-40	38	38-45	40	40-45	40-50	40-80	45	45-50	48	50	50-55	50-60	60	70-80
Maxwell	
Mitchell	
Model	
Moline	
Monarch	
Moon	
National	
Northern	
Oldsmobile	
Packard	
Peerless	
Pennsylvania	
Perfection	
Pierce-Racine	
Pope-Hartford	
Pope-Toledo	
Premier	
Pullman	
Pungs-Finch	
Rainier	
Rambler	
Royal Tourist	
Selden	
Shawmut	
Shoemaker	
Simplex	

[illegible]

FRANCE	Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p.																								
	26-32	28	26-35	28-30	30	30-35	30-40	32	35	35-40	38	38-45	40	40-45	40-50	40-50	45	45-50	46	48	50	50-55	50-60	60	70-80
Ariès	3600	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bayard-Clément	3300	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3900	.....	.....	5600
Béatrix	4600	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Berliet
Bollée (Léon)
Brasier	3400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brouhot	3000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Call Bordenal	3500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charron	3800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chenard-Walcker	2500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clément-Gladiator
Corre	3200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cottin-Desquottes
Decauville	3400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
De Dion Bouton	3100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Delaugère-Clayette
Delaunay-Belleville
Gillet-Forest
Gobron-Brillat
Guillemin
Henriot
Hotchkiss
La Buire
Lethimonnier
Lorraine-Dietrich
Louet

FRANCE—Continued		Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p.—Continued.																								
NAME OF CAR		26-32	28	28-35	28-30	30	30-35	30-40	32	35	35-40	38	38-45	40	40-45	40-50	40-50	45	45-50	46	48	50	50-55	50-60	60	70-80
Luc Court		.....	.....	.....	.....	.....	.....	.....	.....	3300	.....	.....	.....	.....	4400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Milde-Gallardet		.....	.....	.....	.....	.....	.....	.....	.....	4400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mors		.....	3400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4000	.....	.....	.....	.....	.....	.....	5000	.....	.....	.....	.....
Motobloc		.....	.....	.....	.....	.....	.....	.....	.....	3100	.....	.....	.....	.....	3800	.....	.....	.....	.....	.....	.....	.....	.....	.....	5600	.....
Niclausse		.....	.....	.....	.....	.....	.....	.....	.....	.....	5200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panhard-Levassor		.....	.....	.....	.....	.....	.....	.....	.....	.....	3800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5000	.....	.....	.....	.....
Peugeot		.....	3700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pilain		.....	3600	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Prod'homme		.....	.....	.....	.....	.....	.....	.....	.....	.....	2300	.....	.....	.....	3000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rebour		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3600	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Regina-Dixi		.....	3300	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Renault freres		.....	.....	.....	.....	.....	.....	.....	.....	.....	4200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rex		.....	.....	.....	.....	.....	.....	.....	.....	2500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3000	.....	.....	.....	.....
Rochet-Schneider		.....	.....	.....	.....	.....	.....	.....	.....	3700	.....	.....	.....	.....	4800	.....	.....	.....	.....	.....	.....	.....	.....	.....	6000	.....
Rolland-Pilain		.....	.....	.....	.....	.....	.....	.....	.....	.....	3200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rossel		.....	3200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Roy (Georges)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tourand		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3500	.....	.....	3900	.....
Vinot-Deguingand		.....	.....	.....	.....	.....	.....	.....	.....	3000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Werner		.....	.....	.....	.....	.....	.....	.....	.....	.....	4200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weyer-Richmond		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
GERMANY		Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p. * Price with body.																								
Adler		.....	3625	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bens		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5300	.....	.....	.....	.....	.....	5600	.....	.....	6200	.....
Horch		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

GERMANY—Continued		Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p.—Continued.																						
	NAME OF CAR	26-32	28	28-35	28-50	30	30-35	30-40	32	35	35-40	38	38-45	40	40-45	45-50	46	48	50	50-55	50-60	60	70-80	
	Mercedes	.....	.....	.....	.....	4000	.....	.....	.....	.....	4200	.....	.....	.....	.....	4700	.....	.....	.....	.....	.....	5400	6000
	Opel	.....	.....	.....	.....	.....	.....	.....	.....	.....	3625	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Saurer	.....	.....	.....	.....	4000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5000	.....	.....	.....
GREAT BRITAIN		Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p. * Price with body.																						
	Ariel-Simplex	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Armstrong-Whitworth	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Atalanta	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Austin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Bell	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Belsize	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Daimler	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Daimler-Mercedes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Dennis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Humber	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Londonia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Napier	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	N. E. C.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Orleans	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Owen	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Pilgrim	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Siddeley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Speedwell	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Sunbeam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Talbot	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Thornycroft	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

GREAT BRITAIN—Cont'd		Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p. * Price with body—Continued.																								
NAME OF CAR		28-32	28	28-35	28-50	30	30-35	30-40	32	35	35-40	38	38-45	40	40-45	40-50	40-80	45	45-50	46	48	50	50-55	50-60	60	70-80
West Aster		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Withers		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Albion (Scotland)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Arrol-Johnston (Scotland)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
HOLLAND		Price of 4 cylinder 1908 complete cars, 26-32 h. p. to 70-80 h. p.																								
Spyker		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
ITALY		Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p. * Price with body																								
Blanchi		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fiat		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florentia		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Isotta-Fraschini		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Junior		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marchand		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rapid		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spa		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Züst		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
SPAIN		Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p.																								
Hispano-Suiza		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
SWITZERLAND		Price of 4 cylinder 1908 chassis, 26-32 h. p. to 70-80 h. p. * Price with body.																								
Martini		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Piccard		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

AMERICA	Price of 6 cylinder 1908 complete cars, 15-18 h. p. to 40-60 h. p.													
	15-18	18-24	20	20-24	20-30	25	25-30	26	28-32	30	30-35	30-40	32-35	35
NAME OF CAR														
American Mors	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Belden	....	....	....	....	....	....	....	....	....	....	....	....	....	4250
Comet	....	....	....	....	....	....	....	....	....	5000	....	....	....	....
C. V. I.	....	....	....	....	....	....	....	....	....	....	....	....	....	4000
Ford	....	....	....	....	....	....	....	....	....	....	....	....	....	2800
Marion	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pierce Great Arrow	....	....	....	....	....	....	....	....	....	....	....	....	....	5500
York-Fullman	....	....	....	....	....	....	....	....	....	2750	....	....	....	....
BELGIUM	Price of 6 cylinder 1908 chassis, 15-18 h. p. to 40-60 h. p. *Price with body.													
Miesse	....	....	....	....	....	....	....	....	....	....	....	....	....	3475
Minerva	....	....	....	....	....	....	....	....	....	....	....	....	....	*4800
FRANCE	Price of 6 cylinder 1908 chassis, 15-18 h. p. to 40-60 h. p.													
Artès	2800	....	....	....	....	....	....	....	....	....	....	....	....	3800
Béatrix	....	....	3900	....	....	....	....	....	....	....	....	....	....	....
Berliet	....	....	....	....	....	....	....	....	....	....	....	....	....	4000
Bollée (Léon)	....	....	....	....	....	....	....	....	4500	....	....	....	....	....
Brasier	....	....	....	....	....	....	....	....	3800	....	....	....	....	....
Cottin-Desgouttes	....	....	....	....	....	....	....	....	5000	....	....	....	....	....
Darracq	....	....	....	....	....	....	....	....	....	....	....	....	....	3280
Delaunay-Belleville	2700	....	....	....	....	....	....	....	....	....	....	....	....	4800
Gladiator	....	....	....	....	....	....	....	....	3700	....	....	....	....	....
Hotchkiss	....	....	....	....	....	....	....	....	....	....	....	....	4400	....
La Buire	....	....	3600	....	....	....	....	....	4000	....	....	....	....	5000
Lorraine-Diétrich	3000	....	....	....	....	....	....	....	....	....	....	....	....	....
Rex	2100	....	....	....	....	....	....	....	....	....	....	....	....	....

FRANCE—Continued		Price of 6 cylinder 1908 chassis, 15-18 h. p. to 40-60 h. p.—Continued.																	
NAME OF CAR		15-18	18-24	20	20-24	20-30	25	25-30	28	28-32	30	30-35	30-40	32-35	35	35-45	40	40-50	40-60
Rochet-Schneider		....	....	....	....	....	....	....	....	4800	....	....	....	....	....	....	....	....	....
Rosell		....	....	....	....	....	....	....	....	4200	....	....	....	....	....	....	4600	....	....
S. C. A. R.		....	....	....	....	....	....	....	....	....	....	....	....	....	4000	....	....	....	....
Sixtyl-Bréguet		....	....	....	....	....	....	....	....	3800	....	....	....	....	....	....	....	....	....
Weyher et Richemond		....	....	....	3300	....	....	....	....	....	....	....	....	....	....	....	....	....	....
GREAT BRITAIN		Price of 6 cylinder 1908 chassis, 15-18 h. p. to 40-60 h. p. *Price with body.																	
Ariel-Simplex		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	*4975
Belsize		....	....	....	....	....	....	....	....	....	*2975	....	....	....	....	....	....	....	....
Brooke		....	....	....	....	....	....	*2950	....	....	....	....	....	....	....	....	*2250	....	....
Courier		....	....	....	....	....	*2125	....	....	....	....	....	....	....	....	....	....	....	....
Empress		....	....	....	*2700	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hillman-Coatalen		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	*3500	....	....
Horlick		*3000	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Humber		....	....	....	....	....	....	....	....	....	*2250	....	....	....	....	....	....	....	....
Iris		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4375	....	....
J. and B. Vertx		....	....	....	....	....	....	....	....	....	*2250	....	....	....	....	....	....	....	....
Lanchester		....	....	....	....	....	....	*3500	....	....	....	....	....	....	....	....	....	....	....
Londonia		....	....	....	....	....	....	....	....	....	*2250	....	....	....	....	....	....	....	....
M. M. C.		....	....	....	....	....	....	....	....	....	....	....	....	....	....	*2575	....	....	....
Napier		....	....	....	....	....	....	....	....	....	*2375	....	....	....	....	....	*4475	....	....
Orleans		....	....	....	....	....	....	....	....	....	....	....	....	....	*4875	....	....	....	....
Osterfield		....	....	....	....	....	....	....	....	....	*2750	....	....	....	....	....	....	....	....
Owen		....	....	....	....	....	....	....	....	....	....	....	....	....	*2375	....	....	....	....
Rolls-Royce		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	*5485	....
Scout		....	....	....	....	....	....	....	....	....	*2250	....	....	....	....	....	....	....	....

GREAT BRITAIN—Continued		Price of 6 cylinder 1908 chassis, 15-18 h. p. to 40-60 h. p. * Price with body—Continued.																	
NAME OF CAR		15-18	18-24	20	20-24	20-30	25	25-30	28	28-32	30	30-35	30-40	35	35-45	40	40-50	40-60	
Simms-Welbeck		....	....	....	....	....	....	....	....	....	....	*3850	....	....	....	....	....	....
Speedwell		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	*3875	....
Standard		....	....	*2350	....	....	....	....	....	....	....	....	....	....	....	*2625	....	....
Star		....	....	....	....	....	....	....	....	....	*3000	....	....	....	....	....	....	....
Vulcan		....	....	....	....	....	....	....	....	....	....	....	....	....	....	2504	....	....
Wasp		....	....	....	....	....	*2500	....	....	....	....	....	....	....	....	....	....	....
ITALY		Price of 6 cylinder 1908 chassis, 15-18 h. p. to 40-60 h. p.																	
NAME OF CAR		15-18	18-24	20	20-24	20-30	25	25-30	28	28-32	30	30-35	30-40	32-35	35	35-45	40	40-50	40-60
Fiat		4000
Florentia		3400	4250
Isotta Fraschini		3000
San Giorgio		3400	4000
Spa		3600
SPAIN		Price of 6 cylinder 1908 chassis, 15-18 h. p. to 40-60 h. p.																	
Hispana-Suiza		3500

AMERICA		Price of 6 cylinder 1908 complete cars, 42 h. p. to 90 h. p.																
	NAME OF CAR	42	42-50	45	45-50	45-55	48	50	50-55	50-60	54-60	60	60-70	60-75	70	75	80	90
	Acme	....	....	4500	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	Apperson	....	....	....	....	....	....	....	5000	....	....	....	....	....	....	....	....	....
	Austin	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6000
	Berliet	....	....	....	....	....	....	....	....	....	....	7500	....	....	....	....	....	....
	Colt	....	....	1750	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	Continental	....	....	....	....	....	....	3750	....	....	....	....	....	....	....	....	....	....
	Franklin	4000	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	Gearless	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4000	....	....
	Glide	....	....	....	....	....	....	....	....	4000	....	....	....	....	....	....	....	....
	Lozier	....	....	....	....	....	....	6000	....	....	....	....	....	....	....	....	....	....
	Mora	....	3600	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	Napier	....	....	....	....	....	....	....	....	....	....	6500	....	....	....	....	....	....
	Oldsmobile	....	....	....	....	....	....	....	....	....	....	4200	....	....	....	....	....	....
	Peerless	....	....	....	....	....	....	....	....	....	....	6000	....	....	....	....	....	....
	Pierce Great Arrow	....	....	....	....	....	....	....	....	....	....	6500	....	....	....	....	....	....
	Premier	....	....	....	....	3750	....	....	....	....	....	....	....	....	....	....	....	....
	Speedwell	....	....	....	....	....	....	....	....	....	....	4250	....	....	....	....	....	....
	Stearns	....	....	6250	....	....	....	....	....	....	....	....	....	....	....	....	....	....
	Stevens-Duryea	....	....	....	....	....	....	6000	....	....	....	....	....	....	....	....	....	....
	Stillson	....	....	....	....	....	....	....	....	4500	....	....	....	....	....	....	....	....
	Stoddard-Dayton	....	....	....	....	....	....	....	....	4500	....	....	....	....	....	....	....	....
	Thomas	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6000	....	....
	Welch	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6000	....	....
	Winton	....	....	....	....	....	4500	....	....	....	....	....	....	....	....	....	....	....

FRANCE		Price of 6 cylinder 1908 chassis, 42 h. p. to 90 h. p.												4800												
Berliet		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bollée (Léon)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brasier		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gladiator		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gobron-Brillié		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lorraine-Diétrich		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mors		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panhard-Levassor		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peugeot		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Renault frères		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rex		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rochet-Schneider		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rossel		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Roy (Georges)		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sixcyl-Bréguet		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vinot-Deguingand		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
		Price of 6 cylinder 1908 chassis, 42 h. p. to 90 h. p. * Price with body.																								
GERMANY		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Horch		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mercedes		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
		Price of 6 cylinder 1908 chassis, 42 h. p. to 90 h. p. * Price with body.																								
GREAT BRITAIN		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Atalanta		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ariel-Simplex		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

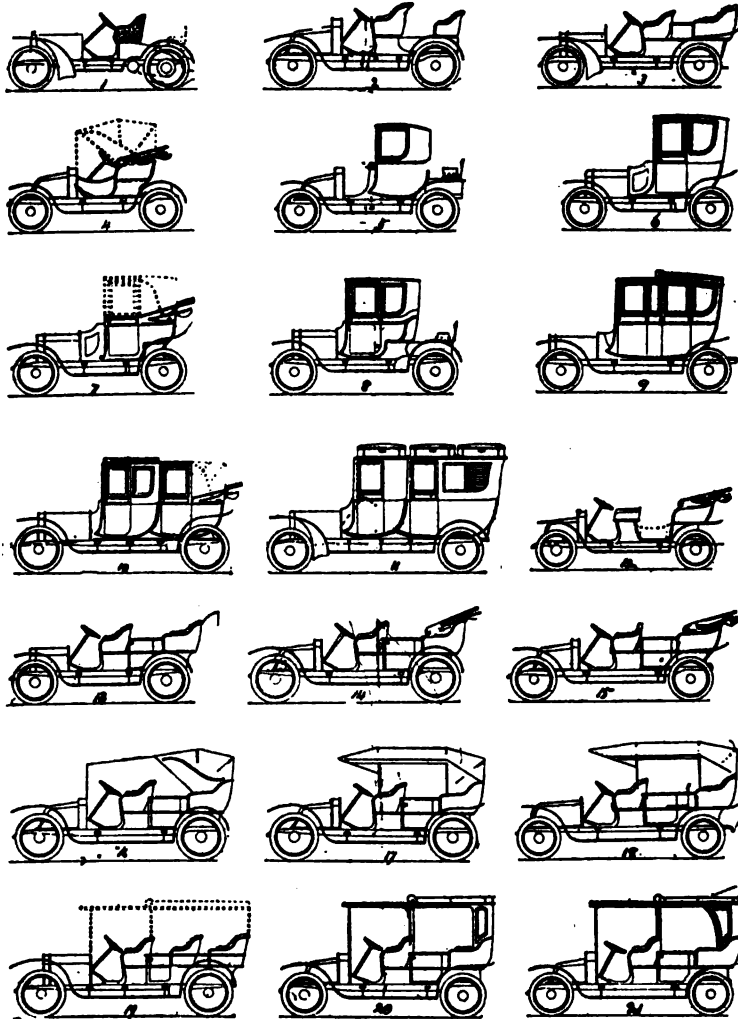
GREAT BRITAIN—Continued		Price of 6 cylinder 1908 chassis, 42 h. p. to 90 h. p. * Price with body—Continued.																
NAME OF CAR		42	42-50	45	45-50	45-55	48	50	50-55	50-60	54-60	60	60-70	60-75	70	75	80	90
Austin		....	....	....	....	....	....	....	....	....	....	*4625	....	....	....	....	....	....
Beldize		....	....	....	....	....	....	....	....	....	....	5000	....	....	....	....	....	....
Daimler-Mercedes		....	....	....	....	....	....	....	....	*4750	....	....	....	....	....	....	....	....
Gladiator		....	....	....	....	....	....	....	....	....	....	*4435	....	....	....	....	....	....
J. and B. Vertex		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lanchester		....	....	....	....	....	....	*4750	....	....	....	....	....	....	....	....	....	....
Napier		....	....	....	....	....	....	....	....	....	....	*5750	....	....	....	....	*8250	....
Owen		....	....	....	....	....	....	*2975	....	....	....	....	....	....	....	....	....	....
Sheffield-Simplex		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Siddeley		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Thames		....	....	....	....	....	....	*4375	....	....	....	*5250	....	....	....	....	5850	....
Thornycroft		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wasp		....	....	....	....	....	....	....	....	....	....	4250	....	....	....	....	....	....
Welgel		....	....	....	....	....	....	....	....	....	....	5500	....	....	....	....	....	....
ITALY		Price of 6 cylinder 1908 chassis, 42 h. p. to 90 h. p.																
Fiat		....	....	....	....	....	....	....	....	....	....	....	5000	....	....	....	....	....
San Giorgio		....	....	....	4800	....	....	....	....	....	....	....	....	....	....	....	....	....
Spa		....	....	....	....	....	....	....	....	....	....	....	5200	....	....	....	....	....
SPAIN		Price of 6 cylinder 1908 chassis, 42 h. p. to 90 h. p.																
Hispania-Suiza		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5000	....

AMERICA		Price of 8 cylinder 1908 complete cars.					
NAME OF CAR	H. P.	15-1	20-30	24-60	28-32	35	40
Cartercar		2250	3500	....	....	....
FRANCE		Price of 8 cylinder 1908 chassis.					
Antoinette		3000	....	....	4400	....	....
Burlat		3000	....	....
GREAT BRITAIN		Price of 8 cylinder 1908 complete cars.					
Iden		2975	....
Osterfield		4600

Types of Automobile Bodies

In the accompanying text and plates will be found nearly every type of automobile body now used. Body construction has changed materially during the past few years, and now the styles in common use not only embrace practically all those employed in carriage con-

every point to ensure extreme lightness being considered. A small extra seat for mechanic's use is shown at the back; this is of such a nature that it can be completely collapsed and made to retire into the rear back box or tool and tire carrying space.



struction, but many others that have been evolved to meet the needs of automobile users. The numbers used in the text correspond with those on the plates.

1. This is a two-seater or racing type, suitable for testing purposes, or is preferred for general use by many motorists who desire to keep their cars exclusively for their own use, and not to entertain their friends. It is built very lightly and is so constructed that the panels of the seats are made with a wire mesh,

2. This sketch represents a more elaborate and graceful design with the same ends in view; the rear seat in this case is more of a permanent fixture, inasmuch as it does not fold into the locker.

3. An ordinary tonneau with back entrance, or it can be arranged so that the front seat should swing or revolve to allow of ingress to the car.

4. Here is a small Victoria type body to seat two; fitted with a folding hood, either leather or canvas covered, with a glass screen to the front, arranged so that the top of the hood should meet the

Automobile Bodies (Continued)

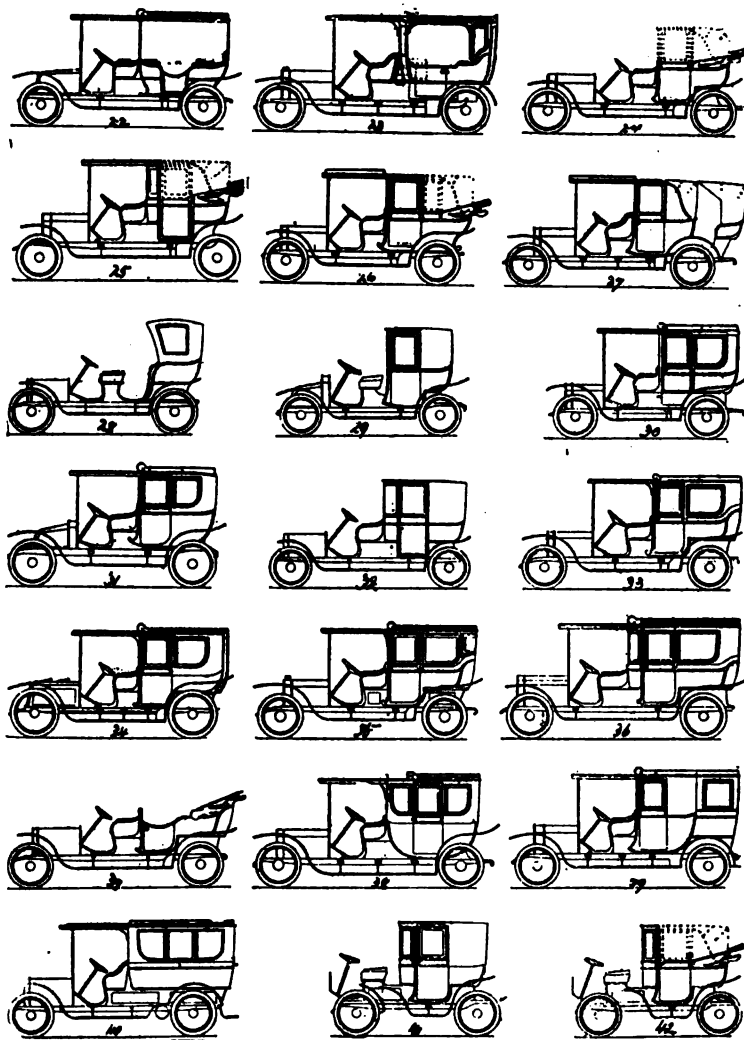
screen. This is a type very much in favor among country doctors, providing as it does, a carriage seat and high class in appearance, yet light on tires, and not necessitating a large horse-power and gasoline consumption, thus keeping the cost of upkeep within the limits of the daily use of a country medico.

5. Is an enclosed coupé, which allows for being driven from the inside, and is

Automobile Bodies (Continued)

8. Is a completely enclosed coupé, which allows of driving from inside.

9. Here is a novel design of a double coupé, with the front completely enclosed. The lines of this are carried out in the style of an old posting coach, which is a design that lends itself to a very graceful appearance, taking away the rigidity of straight lines, which, in a covered body on a similar car, tend to



fitted with an extra seat for mechanic's or personal use. This also is a type very much in favor by doctors.

6. Represents a more elaborate design with the same end in view. It will be seen that the steering wheel and lubricator are entirely cased in; no particular object is achieved here except that of novelty in design and appearance.

7. Represents a single landaulet with the front cased in in the same manner.

destroy the harmonious appearance of the whole.

10. Is a variation on these lines, the rear part being made in landaulet style.

11. This embodies the same idea, the rear of the carriage being expressly designed for long touring purposes in sunny climates.

12. This is a small park or town type, being practically a Victoria. The usual objection to a Victoria type body, name-

Automobile Bodies (Continued)

ly, that the occupants of the back of the car suffer from an extreme draught blowing in behind the driving seats, has been overcome by the substitution of wind doors as indicated by the dotted lines.

13. Here is a graceful phaeton with side-entrance, otherwise similar design to No. 3.

14. This shows the ever popular Roi des Belges, fitted with a hood to the rear. This type is again shown in No. 16, with the rear hood up, and an extension blind or curtain is carried from the front of the rear hood to the top of the glass screen in front of the driver. This is a very convenient method of protecting the front seat, but has a strong objection against it in regard to appearance.

15. This is a Victoria type of side-entrance body.

17. Indicates the Roi des Belges type phaeton fitted with a useful double extension hood.

18. Is an extended type of the same body made to seat two extra persons, a folding or collapsing arm chair being placed forward of the rear seats.

19. Is a type that may, be aptly described as a "triple phaeton," seating seven persons including the driver; the extra inside seats in this case are not of a collapsible or folding form, but are built in as part of the original construction of the body. To obtain this effect a very long chassis is necessary, and the side entrance door has to be limited in size. On the other hand, a very comfortable seating space is arrived at for the extra passengers.

20. Here is a handsome phaeton of Roi des Belges design, fitted with a canopy. This canopy has a large panel at the rear, brought round the elbow, practically converting the car into a semi-limousine; in fact, this type of body is frequently described in this manner.

21. Is a variation of the same, the rear panel being of cab shape.

22. Is a type that is very rare, and not likely to be in very great demand; in fact, probably this design was created to the special requirements or pattern of one particular customer. It will be seen that the occupants of the rear or end part of the car are able to vis-a-vis in the same style as a landau. This again requires good length of chassis.

23. Is a limousine with removable sides. This type of body allows great range of possibility in regard to the manner of usage, combining as it does a canopied car, a semi-limousine and a full limousine. It should be very carefully constructed in order to obviate rattling,

Automobile Bodies (Continued)

owing to the numerous movable parts involved.

24. Is a single landaulet of a standard type, made to entirely fold down to enable the car to be used as a closed town carriage or a country vehicle.

25. Is a double landaulet the front of which is fixed, extra seats being arranged in the space between the driver's seat and the side door.

26. Illustrates a limousine landaulet. This design of carriage came into vogue about three years ago, since when it has gained ever increasing popularity among motorists, especially in this country, its advantage being that it enables a large and commodious carriage to be built in the limousine style, and yet can be easily equipped and converted to a completely open carriage.

27. Shows a single landaulet with an arrangement at the back for seating a servant.

28. Is a cab type, carried out on the familiar lines of a London hansom.

29. Shows a smart coupé, a type of carriage which, while not greatly used for motorcar work, yet has many advantages, particularly lending itself to a smart and neat appearance; in fact, it is from this type of body that the limousine has been evolved; the limousine being practically nothing more or less than a large coupé.

30, 31, 32, 33, 34, 35 and 36. These are variations of the limousine. This vehicle is coming more and more into daily use among motorists, especially on the Continent. It is one that lends itself admirably to luxurious equipment and fitting, while the occupants are well protected from the weather. It is true that it is always closed, but if made with large windows, which in their turn are made to open, almost the same advantages are gained as with a canopied car, with the advantage of greater comfort and equipment.

32. Is a cab type made to seat four.

37. Is a further variation of the phaeton.

38. Represents a "Berline"—a very unusual type of body, it being carried out on the lines of a stage coach.

39. Shows an enclosed coupé with an extra continuation to back for luggage and servants, very suitable for long touring where the owner of the car wishes to carry a retinue or personal attendants conveniently.

40. Gives a large station or estate omnibus.

41 and 42. Are respectively coupé and landaulet types for electric vehicles, being purely town carriages.

THEORETICAL MOTOR HORSEPOWER

Horsepower Delivered to the Wheels

(French Formula)

Number of Cylinders	Bore (mm)	Total piston surface (sq. cm.)	Horsepower	H. P. deliv- ered to wheels	Number of cylinders	Bore (mm)	Total piston surface (sq. cm.)	Horsepower	H. P. deliv- ered to wheels.
1	85	56.74	5.6	3.5	4	85	226.96	22.6	14.2
	90	63.61	6.5	4.0		90	254.44	25.9	16.3
	95	70.88	7.4	4.6		95	283.52	29.5	18.5
	100	78.54	8.3	5.2		100	314.16	33.4	21.0
	105	86.58	9.4	5.9		105	346.32	37.6	23.6
	110	95.03	10.5	6.6		110	380.12	42.0	26.4
2	115	103.87	11.7	7.3	115	415.44	46.7	29.3	
	120	113.09	12.9	8.1		120	452.36	51.8	32.5
	85	113.48	11.3	7.1		125	490.87	57.1	35.9
	90	127.22	12.9	8.1		130	530.92	62.7	39.4
	95	141.76	14.7	9.2		135	572.54	68.7	43.1
	100	157.08	16.7	10.5		140	615.75	75.0	47.1
3	105	173.16	18.7	11.8	145	660.52	81.5	51.2	
	110	190.06	21.0	13.2		150	706.86	88.5	55.6
	115	207.74	23.3	14.6		155	754.76	95.7	60.1
	120	226.19	25.9	16.2		160	804.24	103.3	64.9
	85	170.22	16.9	10.6		165	855.28	111.2	69.9
	90	190.85	19.4	12.2		170	907.92	119.5	75.0
4	95	212.64	22.1	13.9	175	962.12	128.1	80.4	
	100	235.62	25.0	15.7		180	1017.88	137.6	86.0
	105	259.77	28.4	17.7		185	1075.20	146.3	91.9
	110	285.09	31.5	19.8		190	1134.12	156.0	99.0
	115	311.60	35.0	22.0		195	1194.60	166.1	104.3
	120	339.29	38.8	24.4		200	1256.64	176.5	110.8

H. P. Delivered to Wheels Required to Propel an Open Car of a Given Weight at a Given Speed on a Level Road

Kilometers per hour	Miles per hour	WEIGHT OF CAR WITH PASSENGERS										Absorbed power by air resistance for every cubic meter surface
		600 Kilos.	800 Kilos.	1000 Kilos.	1200 Kilos.	1400 Kilos.	1600 Kilos.	1800 Kilos.	2000 Kilos.	2200 Kilos.	2400 Kilos.	
		1322.76 pounds	1763.7 pounds	2204.6 pounds	2645.5 pounds	3086.4 pounds	3527.3 pounds	3968.2 pounds	4409.2 pounds	4850 pounds	5291 pounds	
25	1.55	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.
30	1.86	2.0	2.5	3.0	3.6	4.1	4.6	5.1	5.6	6.1	6.6	0.3
35	2.17	2.6	3.2	3.8	4.4	5.1	5.8	6.3	7.0	7.7	8.4	0.5
40	2.48	3.3	4.0	4.7	5.3	6.1	6.8	7.6	8.3	9.0	9.7	0.8
45	2.79	4.0	4.8	5.6	6.4	7.2	8.0	8.9	9.9	10.7	11.5	1.2
50	3.1	4.6	5.6	6.6	7.6	8.5	9.4	10.4	11.5	12.5	13.5	1.8
55	34.	5.4	6.7	8.0	9.1	10.2	11.3	12.4	14.5	15.8	17.1	2.5
60	37.26	6.9	8.1	9.3	10.4	11.7	12.9	14.0	15.3	16.5	17.7	3.3
65	40.36	8.3	9.6	10.9	12.2	13.5	14.8	16.2	17.5	18.8	20.1	4.3
70	43.47		11.1	12.5	14.0	15.3	16.9	18.2	19.8	21.2	22.6	5.3
75	46.57		13.2	14.7	16.2	17.7	19.2	20.7	22.3	23.8	25.3	6.8
80	49.68		15.1	16.7	18.3	20.0	21.7	23.4	25.0	26.6	28.2	8.3
85	52.78		17.4	19.1	20.9	22.6	24.3	26.0	27.9	29.6	31.3	10.2
90	55.89		20.0	21.8	23.6	25.1	27.3	29.1	31.0	32.8	34.6	12.2
95	59.		22.7	24.6	26.6	28.5	30.5	32.4	34.5	36.4	38.3	14.6
100	62.10		25.4	27.5	29.6	31.7	33.8	35.8	38.0	40.1	42.2	17.0
105	65.20		27.8	31.0	33.2	35.3	37.5	39.8	42.0	44.2	46.4	19.8
110	68.31			34.8	37.0	39.3	41.6	43.8	46.4	48.7	51.0	23.0
115	71.41			38.8	41.3	43.6	45.9	48.3	50.9	53.3	55.7	26.5
120	74.52			43.0	45.6	48.1	50.6	53.2	55.9	58.5	61.1	30.3
125	77.62			47.8	50.4	53.0	55.7	58.2	60.0	62.4	64.8	34.5
130	80.73			53.0	55.7	58.4	61.1	63.9	66.7	69.4	71.1	39.0
135	83.83			58.4	61.2	64.2	66.9	69.8	72.7	75.6	77.5	44.0
140	86.94			64.1	67.0	69.9	72.8	75.8	79.0	81.9	84.8	49.3
				70.0	73.0	76.0	79.0	82.0	85.5	88.2	91.5	54.7

**H. P. Delivered to Wheels Required to Propel an Open Car of a Given Weight
at a Given Speed on a 5 Per Cent. Incline.**

Kilometers per hour	Miles per hour	WEIGHT OF CAR WITH PASSENGERS										Absorbed power by air resistance for every cubic meter surface
		600 Kilos. 1322.76 pounds	800 Kilos. 1763.7 pounds	1000 Kilos. 2204.6 pounds	1200 Kilos. 2645.5 pounds	1400 Kilos. 3086.4 pounds	1600 Kilos. 3527.3 pounds	1800 Kilos. 3968.2 pounds	2000 Kilos. 4409.1 pounds	2200 Kilos. 4850 pounds	2400 Kilos. 5291 pounds	
		H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	
10	6.2	1.8	2.4	3.0	3.7	4.3	4.8	5.4	6.0	6.6	7.2	
15	9.3	2.8	3.7	4.6	5.4	6.3	7.3	8.1	9.0	9.9	10.8	
20	12.42	3.8	5.0	6.2	7.4	8.5	9.7	10.9	12.1	13.3	14.5	
25	15.5	4.6	6.1	7.6	9.0	10.5	12.0	13.3	15.0	16.5	18.0	
30	18.6	5.8	7.6	9.4	11.1	12.9	14.7	16.5	18.3	20.1	21.9	0.3
35	21.7	7.0	9.0	11.1	13.2	15.2	17.3	19.3	21.4	23.5	25.5	0.5
40	24.8	8.5	10.8	13.1	15.4	17.7	20.0	22.3	24.8	27.1	29.4	0.8
45	27.9	9.8	12.4	15.0	17.7	20.3	23.0	25.6	28.2	30.8	33.4	1.2
50	31.	11.5	14.4	17.3	20.2	23.2	26.0	29.0	32.0	34.9	37.8	1.5
55	34.	13.0	16.3	19.5	22.8	26.0	29.2	32.5	35.7	38.9	42.2	3.3
60	37.26	14.9	18.5	22.1	25.7	29.2	32.7	36.2	39.8	43.3	46.8	4.3
65	40.36	17.2	21.0	24.8	28.6	32.5	36.3	40.1	43.8	47.6	51.4	5.3
70	43.47	19.4	23.5	27.6	31.8	35.8	39.8	44.0	48.1	52.2	56.3	6.8
75	46.57	22.0	26.3	30.6	35.0	39.3	43.6	48.0	52.6	56.9	61.2	8.3
80	49.68	25.7	30.3	34.9	38.6	43.3	48.0	52.6	57.4	62.0	66.6	10.2
85	52.78	27.8	32.7	37.6	42.5	47.6	52.4	57.5	62.5	67.4	72.3	12.2
90	55.89	30.5	35.8	41.1	46.3	51.6	57.0	62.3	67.5	72.8	78.1	14.6
95	59.	33.8	39.4	45.1	50.7	56.3	61.8	67.5	73.3	78.9	84.5	17.0
100	62.10	37.7	43.6	49.5	55.4	61.3	67.0	73.0	79.0	85.0	91.0	19.8

**H. P. Delivered to Wheels Required to Propel an Open Car of a Given Weight
at a Given Speed on a 10 Per Cent. Incline**

Kilometers per hour	Miles per hour	WEIGHT OF CAR WITH PASSENGERS										Absorbed power by air resistance for every cubic meter surface
		600 Kilos. 1322.76 pounds	800 Kilos. 1763.7 pounds	1000 Kilos. 2204.6 pounds	1200 Kilos. 2645.5 pounds	1400 Kilos. 3086.4 pounds	1600 Kilos. 3527.3 pounds	1800 Kilos. 3968.2 pounds	2000 Kilos. 4409.1 pounds	2200 Kilos. 4850 pounds	2400 Kilos. 5291 pounds	
		H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	
5	3.1	1.6	2.1	2.6	2.8	3.4	3.8	4.3	4.8	5.3	5.6	"
10	6.2	2.8	3.8	4.8	5.8	6.9	7.8	8.7	9.7	10.7	11.7	"
15	9.3	4.5	5.9	7.3	8.7	10.2	11.6	13.0	14.4	15.8	17.2	"
20	12.42	6.0	7.9	9.8	11.6	13.5	15.4	17.4	19.3	21.2	23.1	"
25	15.5	7.5	9.9	12.3	14.7	17.0	19.4	21.7	24.2	26.6	29.0	0.3
30	18.6	9.4	12.2	15.0	17.8	20.6	23.5	26.3	29.3	32.1	34.9	0.5
35	21.7	11.0	14.3	17.6	20.8	24.2	27.4	30.8	34.2	37.5	40.8	0.8
40	24.8	12.8	16.6	20.4	24.1	27.9	31.8	35.6	39.4	43.2	47.0	1.2
45	27.9	14.6	18.9	23.2	27.4	31.8	36.0	40.3	44.7	49.0	53.2	1.8
50	31.	16.8	21.6	26.4	31.2	36.0	40.8	45.6	50.3	55.1	59.9	2.5
55	34.	19.2	24.4	29.6	34.7	40.0	45.3	55.4	55.8	61.0	66.2	3.3
60	37.26	21.6	27.3	33.0	38.7	44.4	50.2	56.0	61.7	67.4	73.1	4.3
65	40.36	24.1	30.3	36.5	42.7	48.8	55.1	61.4	67.6	73.6	80.0	5.3
70	43.47	27.0	33.7	40.4	47.2	53.8	60.6	67.2	74.0	80.7	87.4	6.8
75	46.57	30.0	37.2	44.4	51.6	58.7	66.0	73.1	80.2	87.4		8.3
80	49.68	33.0	40.8	48.6	56.4	64.1	71.9	79.6	87.4			10.2
85	52.78	36.2	44.6	53.0	61.4	70.0	78.4	86.8				12.2
90	55.89	40.8	49.3	57.8	66.3	75.0	83.4					14.6
95	59.	44.4	53.5	62.6	71.7	80.8						17.0
100	62.10	48.3	58.0	67.7	77.4							19.8

Club List

Adirondack Automobile Club.—E. C. Rogers, Sec., Sandy Hill, N. Y., U. S. A.

Aero Club of America.—12 E. 42nd St., N. Y. City, U. S. A. Augustus Post, Sec.

Aero Club de Belgique.—(Belgian Aero Club). Brussels, Belgium.

Aero Club of France.—84 rue du Faubourg-Saint-Honore, Paris, France. George Besancon, Sec. Gen.

Aero Club of Philadelphia.—E. A. Auster, Sec., 713 Chestnut St., Philadelphia, Pa., U. S. A.

Aero Club Suisse.—(Aero Club of Switzerland). Zurich, Switzerland.

Aero Club of the United Kingdom.—110 Picadilly, London, England. E. O. Pope, Sec.

Aeronautic Club of France.—58 rue Jean-Jacques Rousseau, Paris, France. Roger Aubry and M. Riberyre, secretaries.

Akron Automobile Club.—Akron, O., U. S. A. Dr. F. W. Work, Sec.

Alameda County Automobile Club.—F. F. Weston, Sec. 1392 Webster St. Oakland, Cal., U. S. A.

Alameda Island Automobile Club.—Alameda, Cal., U. S. A.

Albany Automobile Club.—C. D. Hakes, Sec., 61 Lancaster St., Albany, N. Y., U. S. A.

Ashland Automobile Club.—301 Second St., E., (Knight Hotel), Ashland, Wis., U. S. A. B. Maytor Hoppenyan, Sec. and Treas.

Atlantic City Automobile Club.—R. M. Johnston, Sec. Atlantic City, N. J., U. S. A.

Augsburger Verein fur Luftschiffahrt.—(Augsburg Aero Club). Augsburg, Germany.

Augusta Automobile Club.—137 8th St., Augusta, Ga., U. S. A. D. F. Jack, Sec. and Treas.

Aurora Automobile Club.—W. I. Ferris, Pres. Aurora, Ill., U. S. A.

Austin Automobile Club.—E. C. Westwood, Sec. Austin, Ill., U. S. A.

Automobile Association of Center Co.—Robert F. Hunter, Sec. Bellefonte, Pa., U. S. A.

Automobile Club of Hudson Co.—Harry T. Pond, Sec. 46 Bentley Ave., Jersey City, N. J., U. S. A.

Automobile Club of Algeria.—23 Blvd. Carnot. Algeria, Algiers.

Automobile Club of Alsace-Lorraine.—Ohmach-strasse, Strasbourg (Alsace-Lorraine), Germany.

Automobile Club of America.—249 W. 54th St., New York City, U. S. A. S. M. Butler, Sec.

Automobile Club Ardennais.—Ardenes, Bazeilles, France.

Automobile Club of the Aube.—6 rue de la Tour-Boileau, Troyes, France.

Automobile Club of Auburn.—Dr. G. W. Whitney, Sec. 149 Genesee St., Auburn, N. Y., U. S. A.

Automobile Club of Austria.—10 Koe-ruthnerring, Vienna, Austria.

Automobile Club of Auvergne.—18 Place de Jaude, Clermont-Ferrand, France.

Automobile Club of Barcelona.—rue de Rosselon, Barcelona, Spain.

Automobile Club of Baltimore City.—Jas. S. Reese, Sec., Baltimore, Md., U. S. A.

Automobile Club Bearnais.—17 rue de la Prefecture, Pan, France.

Automobile Club of Belfort.—Belfort, France.

Automobile Club of Belgium.—5 Place Royale, Brussels, Belgium. Villegas de Saint-Pierre, Sec. Gen.

Automobile Club Biterrois.—Beziers, France.

Automobile Club of Blair Co.—R. H. Fay, Sec., P. O. Box 455, Altoona, Pa., U. S. A.

Automobile Club Bordelais.—2 Place de la Comedie, Bordeaux, France.

Automobile Club of Bourguignon.—8 Place Darcy, Dijon, France.

Automobile Club Brestois.—18 rue de Siam, Brest, France.

Automobile Club of Bridgeport.—F. T. Staples, Sec., Bridgeport, Conn., U. S. A.

Automobile Club of Buffalo.—D. H. Lewis, Sec., 760 Main St., Buffalo, N. Y., U. S. A.

Automobile Club of California.—F. W. McNear, Sec., 415 Montgomery St., San Francisco, Cal., U. S. A.

Automobile Club of Cannes.—1 Blvd. Jean-Hibert, Cannes, France.

Automobile Club of Central Pennsylvania.—F. R. Slifer, Sec., Milton, Pa., U. S. A.

Automobile Club of the Centre.—24 rue Notre-Dame, Bourges, France.

Automobile Club of Cincinnati.—Dr. L. S. Colter, Sec., 3410 Clifton Ave., Cincinnati, O., U. S. A.

Automobile Club of Circleville.—Circleville, O., U. S. A.

Automobile Club of Columbia County.—Dr. C. W. Snyder, Sec., Hudson, N. Y., U. S. A.

Automobile Club Dauphinois.—6 Place de la Halle, Grenoble, France.

Club List (Continued)

- Automobile Club of Davenport.**—A. H. Ruebsam, Sec., Davenport, Ia., U. S. A.
- Automobile Club of Dayton.**—Geo. Andrews, Sec., Dayton, O., U. S. A.
- Automobile Club of Delaware County.**—Dr. H. H. Stoeber, Sec., Chester, Pa., U. S. A.
- Automobile Club of Denmark.**—8 Ostersagade, Copenhagen, Denmark.
- Automobile Club of Detroit.**—Garvin Denby, Sec., Pasadena Apartments, Detroit, Mich., U. S. A.
- Automobile Club of Dordogne.**—8 Place du Quatre Septembre, Périgueux, France.
- Automobile Club of El Reno.**—W. P. De Varney, Sec., El Reno, Okla., U. S. A.
- Automobile Club of Ferrare.**—2 Via Teatini, Ferrare, Italy.
- Automobile Club of Florence.**—Via del Prato, Italy.
- Automobile Club of Forezien.**—Saint-Etienne, France.
- Automobile Club of France.**—Alfred de Rollepote and Louis Dumontpallier, Secretaries Gen.
- Automobile Club of the Gard.**—1 Blvd. Amiral-Courbet, Nîmes, France.
- Automobile Club of Genoa.**—18 Spianata Acquasola, Genoa, Italy.
- Automobile Club of Germantown.**—Mark B. Reeves, Sec., 141 Phil-Ellena St., Germantown, Pa., U. S. A.
- Automobile Club of Hartford.**—G. K. Dustin, Sec., Hartford, Conn., U. S. A.
- Automobile Club of Herault.**—2 rue Moguelone, Montpellier, France.
- Automobile Club Hongrois.**—Palais Torley, 16 Sandorfehez-utca, Budapest, Hungary.
- Automobile Club of Illinois.**—407 Monadnock Bldg., Chicago, Ill., U. S. A. M. Matthews, Sec.
- Automobile Club of Indiana.**—G. E. Varney, Sec. and Treas., Indianapolis, Ind., U. S. A.
- Automobile Club of Italy.**—5 Via Plana, Turin, Italy.
- Automobile Club of Jurassien.**—Maison Devaux, Rochettes, Lons-le-Saunier, France.
- Automobile Club of Kansas City.**—W. P. M. Stevens, Sec., 502 American Bank Bldg., Kansas City, Mo., U. S. A.
- Automobile Club Lorrain.**—12 Place Stanislas, Nancy, France.
- Automobile & Bicycle Club of Lyons.**—2 Palais Grillet, Lyons, France.
- Automobile Club of Macon.**—Charles H. Payson, Sec., Macon, Mo., U. S. A.
- Automobile Club of Maine.**—Howard Winslow, Sec., Portland, Me., U. S. A.

Club List (Continued)

- Automobile Club of Marlborough.**—J. F. J. Otterson, Sec., Marlborough, Mass., U. S. A.
- Automobile Club of Maryland.**—E. A. Dolle, Sec., 12 W. Mount Royal Ave., Baltimore, Md., U. S. A.
- Automobile Club of the Marne.**—Reims, France.
- Automobile Club of Mattoon, Ill.**—George X. Chuse, Sec., Mattoon, Ill., U. S. A.
- Automobile Club of Marseilles.**—52 rue Paradis, Marseilles, France.
- Automobile Club of the Meuse.**—Verdun, France.
- Automobile Club of Milan.**—Piazzale Stazione Nord, Milan, Italy.
- Automobile Club of Minneapolis.**—Sewall D. Andrews, Sec., 309 New York Life Bldg., Minneapolis, Minn., U. S. A.
- Automobile Club of Moscow.**—Blvd. Novinski, Moscow, Russia. J. Treffersfeld, Sec. Gen.
- Automobile Club of Neerlandais.**—Nassauplain, Hague, Holland. G. Venema, Sec. Gen.
- Automobile Club of New Britain.**—W. L. Hatch, Sec., New Britain, Conn., U. S. A.
- Automobile Club of Newburgh.**—George S. Weller, Sec., Newburgh, N. Y., U. S. A.
- Automobile Club of New Jersey.**—G. Franklin Bailey, Sec., Tribune Bldg., New York City, U. S. A.
- Automobile Club of New Orleans.**—Sam Stone, Jr., Sec., 818 Common St., New Orleans, La., U. S. A.
- Automobile Club of Nice.**—Nice, France.
- Automobile Club Normand.**—4 bis, Blvd. d'Orleans, Rouen, France.
- Automobile Club of the North of France.**—4 rue de la Gare, Roubaix, France.
- Automobile Club of Ogden.**—A. V. Withee, Sec., Ogden, Utah, U. S. A.
- Automobile Club of the Oise.**—Compeigne, France.
- Automobile Club of Oneida.**—John Maxwell, Sec., Oneida, N. Y., U. S. A.
- Automobile Club of Oranie.**—3 Blvd. Seguin, Oran, France.
- Automobile Club of Owatonna.**—Dr. A. B. Stewart, Sec., Owatonna, Minn., U. S. A.
- Automobile Club of Philadelphia.**—S. Boyer Davis, Sec., 1325 Land Title Bldg., Philadelphia, Pa., U. S. A.
- Automobile Club of Picardy and Aisne.**—58 rue des Trois Cailloux, Amiens, France.

Club List (Continued)

Automobile Club of Pittsburgh.—Paul C. Wolff, Sec., Baum and Beatty Sts., Pittsburgh, Pa., U. S. A.

Automobile Club Poitevin.—32 rue Carnot, Poitiers, France.

Automobile Club of Red Wing.—Walter B. Sheldon, Sec., Red Wing, Minn., U. S. A.

Automobile Club Rochelais.—La Rochelle, France.

Automobile Club of Rockford.—H. W. Dickerman, Sec., Rockford, Ill., U. S. A.

Automobile Club of the Rhone.—8 rue Boissac, Lyons, France.

Automobile Club of Roman.—Grand Hotel du Boulevard, Blvd. Elisabeth, Bucharest, Roumania. J. Camarashesco, Sec. Gen.

Automobile Club of Russia.—15 Spelernaia, St. Petersburg, Russia, P. Boechel, Sec. Gen.

Automobile Club of St. Joseph.—H. D. Todd, Sec., St. Joseph, Mo., U. S. A.

Automobile Club of St. Cloud.—J. C. Cotton, Sec., St. Cloud, Minn., U. S. A.

Automobile Club of St. Louis.—S. D. Capen, Sec., 901 Security Bldg., St. Louis, Mo., U. S. A.

Automobile Club of St. Paul.—H. S. Johnson, Sec., 911 Pioneer Press Bldg., St. Paul, Minn., U. S. A.

Automobile Club of Salon.—Place de la Grippe, Salon, France.

Automobile Club of San Jose.—B. D. Merchant, Sec., San Jose, Cal., U. S. A.

Automobile Club of the Sarthe.—7 Blvd., Rene-Levasseur, Le Mans, France.

Automobile Club of Schenectady.—A. F. Knight, Sec., Schenectady, N. Y., U. S. A.

Automobile Club of the Seine-et-Oise.—1 Ave. de St. Cloud, Versailles, France.

Automobile Club of Sheboygan.—A. C. Prescott, Sec., Sheboygan, Wis., U. S. A.

Automobile Club of Southern California.—Chas. B. Hopper, Sec., 402 Laughlin Bldg., Los Angeles, Cal., U. S. A.

Automobile Club of Spain.—(Real Automobile Club de Espana), 70 Alcala, Madrid, Spain.

Automobile Club of Springfield.—F. P. Strout, Sec., care Armour & Co., Springfield, Mass., U. S. A.

Automobile Club of Stamford.—Dr. Dean Foster, Sec., Stamford, Conn., U. S. A.

Automobile Club of Syracuse.—Forman Wilkinson, Sec., 701 S. A. & K. Bldg., Syracuse, N. Y., U. S. A.

Automobile Club Toulousain.—6 rue Darquier, Toulouse, France.

Club List (Continued)

Automobile Club of Touraine.—27 rue Victor-Hugo, Tours, France.

Automobile Club of Trenton.—Edward S. Wood, Sec., Trenton, N. J., U. S. A.

Automobile Club of Troy.—Dr. Archibald Buchanan, Sec., Troy, N. Y., U. S. A.

Automobile Club of Turin.—5 Via Plana, Turin, Italy.

Automobile Club of Utica.—Robert M. Hunt, Sec., 4 Lansing St., Utica, N. Y., U. S. A.

Automobile Club of the Var.—Draguignan, France.

Automobile Club Vauclusien.—Café Tailleux, Place de l'Horloge, Avignon, France.

Automobile Club of Venetien.—5 Via San Pietro, Padua, Italy.

Automobile Club of Vermont.—W. D. Woolson, Sec. and Treas., Springfield, Vt., U. S. A.

Automobile Club Vosgien.—16 rue Jean D'Arc, Epinal, France.

Automobile Club of Wayne County.—Walker Land, Sec., Richmond, Ind., U. S. A.

Automobile Club of Washington.—Le Roy Mark, Sec., 1302 G St., N. W., Washington, D. C., U. S. A.

Automobile Club of Wilkesburg.—Dr. W. C. Cook, Sec., 415 Center St., Wilkesburg, Pa., U. S. A.

Automobile Club of Winona.—Theodore Wold, Sec., Winona, Minn., U. S. A.

Baltimore County Motor Club.—Allen Schwartz, Sec., Baltimore, Md., U. S. A.

Bangor Automobile Club.—A. Fred Seem, Sec., 104 Market St., Bangor, Pa., U. S. A.

Bay State Automobile Association.—J. Fortescue, Sec., 282 Dartmouth St., Boston, Mass., U. S. A.

Beaver Valley Motor Club.—Paul H. Baldwin, Sec., Rochester, Pa., U. S. A.

Beloit Automobile Club.—Harry M. Vale, Sec., Beloit, Wis., U. S. A.

Bethlehem Automobile Club.—Wm. E. Martin, Sec. and Treas., Bethlehem, Pa., U. S. A.

Berkeley Automobile Club.—Berkeley Cal., U. S. A.

Binghamton Automobile Club.—S. M. Frechie, Sec., Binghamton, N. Y., U. S. A.

Bloomington Automobile Club.—Henry Thobro, Sec., Gresham Bldg., Bloomington, Ill., U. S. A.

Bloomsburg Automobile Club.—C. W. Funston, Sec., Bloomsburg, Pa., U. S. A.

Club List (Continued)

Brockton Automobile Club.—Edward S. Bryant, Sec., 68 Main St., Brockton, Mass., U. S. A.

Bronxville Automobile Club.—Harry Burt, Sec., Bronxville, N. Y., U. S. A.

Bronx Automobile Club.—J. Stuart Blackton, Sec., 310 Mott Ave., New York City, U. S. A.

California Women's Motor Club.—Clay St., San Francisco, Cal., U. S. A.

Canon City Automobile Club, The.—Dr. Otis Orendorff, Sec., Canon City, Colo., U. S. A.

Cape May Automobile Club.—J. Hiscock, Sec., 1438 S. Penn Sq., Philadelphia, Pa., U. S. A.

Cass County Automobile Club.—Fred M. Taft, Sec., Logansport, Ind., U. S. A.

Cattaraugus County Automobile Club.—George Forbes, Sec., Olean, N. Y., U. S. A.

Cedar Rapids Automobile Club.—George Henderson, Sec., Cedar Rapids, Iowa, U. S. A.

Chenango County Automobile Club.—B. W. Stover, Sec., Norwich, N. Y., U. S. A.

Chicago Automobile Club.—N. H. Van Sicklen, Sec., 17 Plymouth Pl., Chicago, Ill., U. S. A.

Chicago Motor Club.—G. G. Greenburg, Sec., 200 S. Clinton St., Chicago, Ill., U. S. A.

Chicago Tire Club.—G. E. Shugart, Sec., 81 Michigan Ave., Chicago, Ill., U. S. A.

Chicago Women's Motor Club.—Mrs. N. J. Boardman, Sec., Chicago, Ill., U. S. A.

Cleveland Automobile Club.—Charles J. Forbes, Jr., Sec., Cleveland, O., U. S. A.

Cohoes Automobile Club.—E. R. Clifton, Sec., Cohoes, N. Y., U. S. A.

Colorado Automobile Club.—214 Colburn Bldg., Denver, Colo., U. S. A. W. H. Bergtold, Sec.

Council Bluffs Automobile Club.—T. S. Farnsworth, Sec. and Treas., Council Bluffs, Ia., U. S. A.

Corry Motor Club.—W. Edward Marsh, Sec., Corry, Pa., U. S. A.

Cumberland Valley Automobile Association.—Mechanicsburg, Cumberland County, Pa., U. S. A. Dr. Kuhns, Vice-Pres.

Dallas Automobile Club.—Eugene Corley, Sec., 315 Commerce St., Dallas, Tex., U. S. A.

Decatur Automobile Club.—Tom W. Pitner, Sec., Decatur, Ill., U. S. A.

Duluth Automobile Club.—W. W. Walker, Sec., Duluth, Minn., U. S. A.

Club List (Continued)

Elmira Automobile Club.—F. H. Richardson, Pres., Elmira, N. Y., U. S. A.

Elyria Automobile Club.—H. N. Andres, Sec. Elyria, O., U. S. A.

Erie Motor Club.—W. O. Davis, Sec., Erie, Pa., U. S. A.

Florida Automobile Association.—Dr. F. P. Hoover, Sec., Stockton-Budd Building, Jacksonville, Fla., U. S. A.

Florida East Coast Automobile Association.—T. E. Fitzgerald, Sec., Daytona, Fla., U. S. A.

Geneva Automobile Club.—C. W. Fairfax, Sec., Geneva, N. Y., U. S. A.

Glide Automobile Club.—R. A. Whitney, Sec., Peoria, Ill., U. S. A.

Grand Rapids Automobile Club.—Dr. D. Emmet Welch, Sec., Wonderly Bldg., Grand Rapids, Mich., U. S. A.

Hagerstown Automobile Club.—Charles M. Danzer, Sec. Hagerstown, Md., U. S. A.

Hamilton Automobile Club.—S. O. Greening, Pres., Hamilton, Canada.

Herkimer Automobile Club.—William I. Taber, Sec., Herkimer, N. Y., U. S. A.

Houston Automobile Club.—S. E. Bering, Sec., Houston, Tex., U. S. A.

Hudson Valley Automobile Club.—Otis W. Sherman, Sec., Poughkeepsie, N. Y., U. S. A.

Indiana Automobile Club.—R. A. Brown, Sec., Indianapolis, Ind., U. S. A.

Iowa Automobile Club.—W. B. McNutt, Sec., Des Moines, Ia., U. S. A.

Janesville Automobile Club.—Frank H. Blodgett, Sec., Janesville, Wis., U. S. A.

Jacksonville Automobile & Motor Boat Club.—Herbert B. Race, Sec., Jacksonville, Fla., U. S. A.

Kankakee Automobile Club.—C. H. Cobb, Sec., Kankakee, Ill.

Topeka Automobile Club.—R. D. Montgomery, Sec., Topeka, Kan., U. S. A.

Louisville Automobile Club.—G. W. Hubley, Sec., Louisville, Ky., U. S. A.

Ladies' Quaker City Motor Club.—Philadelphia, Pa., U. S. A.

Lakeside Inn Track Association.—E. C. Hickman, Sec., San Diego, Cal., U. S. A.

Lancaster Automobile Club.—Jacob D. Rider, Sec., 20 N. Queen St., Lancaster, Pa., U. S. A.

Lima Automobile Club.—F. T. Cuthbert, Sec., Lima, O., U. S. A.

Long Beach Country Club.—Raymond F. Ayers, Sec., Temple Court Bldg., New York City, U. S. A.

Long Island Automobile Club.—Russel A. Field, Sec., care Brooklyn Eagle, Brooklyn, N. Y., U. S. A.

Club List (Continued)

- Longmont Automobile Club, The.**—H. L. Large, Sec., Longmont, Colo., U. S. A.
- Los Angeles Automobile Club.**—Charles F. Gates, Sec., Los Angeles, Cal., U. S. A.
- Louisville Automobile Club.**—Chas. Chrest, Sec., Louisville, Ky., U. S. A.
- Lycoming County Automobile Club.**—F. Grant Sweet, Sec., Williamsport, Pa., U. S. A.
- Macon Automobile Club.**—H. J. Lamar, Jr., Sec., Macon, Ga., U. S. A.
- Malden Automobile Club.**—H. K. Frost, Sec., Malden, Mass., U. S. A.
- Mankato Automobile Club.**—Charles M. Masters, Sec., Mankato, Minn., U. S. A.
- Martinsburg Automobile Club.**—X. Poole, Sec., Martinsburg, W. Va., U. S. A.
- Mason City Automobile Club.**—Mason City, Ia., U. S. A. W. H. Hathorn, Sec.
- Massachusetts Automobile Club.**—F. L. D. Rust, Sec., Boston, Mass., U. S. A.
- McHenry County Automobile Club.**—E. C. Jewett, Sec., Woodstock, Ill., U. S. A.
- Mercer County Automobile Club.**—W. F. Sadler, Jr., Sec., Trenton, N. J., U. S. A.
- Milwaukee Automobile Club.**—James T. Drought, Sec., Milwaukee, Wis., U. S. A.
- Monmouth Automobile Club.**—Geo. W. Pittenger, Sec., Asbury Park, N. J., U. S. A.
- Motor Club of Wildwood.**—John N. Reeve, Sec., Wildwood, N. J., U. S. A.
- Motor Car Racing Association.**—Jas. G. B. Davy, Sec., 20 St. Paul St., Baltimore, Md., U. S. A.
- Motor Club of Harrisburg.**—J. Sidney Sible, Sec., Harrisburg, Pa., U. S. A.
- Movignante Klub, The.**—Philadelphia, Pa., U. S. A.
- National Capitol Automobile Club.**—E. M. Sutherland, Sec., 819 14th St., N. W., Washington, D. C., U. S. A.
- Neighborhood Touring Club.**—H. P. Maxim, Sec., 55 Prospect Ave., Hartford, Conn., U. S. A.
- New Bedford Automobile Club.**—Eli Watson, Sec., New Bedford, Mass., U. S. A.
- Granite State Automobile Club.**—Albert L. Clough, Sec., Manchester, N. H., U. S. A.
- New Hampshire Automobile Club.**—Charles G. Sheldon, Sec., Exeter, N. H., U. S. A.

Club List (Continued)

- New Jersey Automobile and Motor Club.**—H. A. Bonnell, Sec., 1034 Broad St., Newark, N. J., U. S. A.
- North Jersey Automobile Club.**—Robert Beattie, Jr., Sec., Paterson, N. J., U. S. A.
- New York Automobile Club.**—I. E. Roskam, Sec., 110 W. 34th St., New York City, U. S. A.
- New York Timer's Club.**—P. O. Box 1453, New York City, U. S. A.
- Oceana County Automobile Club.**—Jas. B. McCullum, Sec., Hart, Mich., U. S. A.
- Ohio Valley Automobile Club.**—R. H. Mahlke, Sec., Wheeling, W. Va., U. S. A.
- Oneida Automobile Club.**—H. C. Stone, Sec., Oneida, N. Y., U. S. A.
- Oshkosh Automobile Club.**—F. E. Waite, Sec., Oshkosh, Wis., U. S. A.
- Oswego Automobile Club.**—N. L. Bates, Sec., Oswego, N. Y., U. S. A.
- Pasadena Automobile Club.**—Robert H. Gaylord, Sec., Pasadena, Cal., U. S. A.
- Portage Automobile Club.**—Edward T. Wright, Sec., Portage, Wis., U. S. A.
- Quaker City Motor Club.**—H. C. Harbach, Sec., Majestic Hotel, Philadelphia, Pa., U. S. A.
- Richmond County Automobile Club.**—J. J. Worrell, Sec., New Brighton, Staten Island, N. Y., U. S. A.
- Riding, Driving and Automobile Club.**—Montclair, N. J., U. S. A.
- Riding and Driving Club.**—Baltimore, Md., U. S. A.
- Rochester Automobile Club.**—B. Van Tuyle, Sec., 25 Plymouth Ave., Rochester, N. Y., U. S. A.
- Rockford Automobile Club.**—H. W. Dickerson, Sec., Rockford, Ill., U. S. A.
- Royal Automobile Club, The.**—119 Piccadilly, London, W., England. The Duke of Sutherland, K. G., Pres.
- Rutland Automobile Club.**—Charles A. Matthews, Sec., Rutland, Vt., U. S. A.
- Sacramento Automobile Club.**—H. G. May, Sec., Sacramento, Cal., U. S. A.
- San Antonio Automobile Club.**—C. J. Overman, Sec., 218 W. Commerce St., San Antonio, Tex., U. S. A.
- Scranton Automobile Club.**—J. H. Brooks, Sec., Scranton, Pa., U. S. A.
- Seabrook Automobile Club.**—Col. C. W. Rugers, Pres., Seabrook, Tex., U. S. A.
- Seattle Automobile Association.**—M. Mason, Sec., Seattle, Wash., U. S. A.
- Sedalia Automobile Club.**—M. T. Slane, Sec., 303 Ohio St., Sedalia, Mo., U. S. A.

Club List (Continued)

South Bend Automobile Club.—Horace E. Kiser, Sec., South Bend, Ind., U. S. A.

Southern Automobile & Cycle Club.—Charles Procasky, Sec. and Treas., Belleville, Ill., U. S. A.

Springfield Automobile Club.—G. E. Mentel, Sec., Springfield, O., U. S. A.

Springfield Automobile Club.—R. N. Baker, Sec., Springfield, Ill., U. S. A.

Knoxville Automobile Club.—Henry Howard, Sec., Knoxville, Tenn., U. S. A.

Terre-Haute Automobile Club.—John S. Cox, Sec., Terre-Haute, Ind., U. S. A.

Tidewater Automobile Club.—Frederick Lewis, Sec., 510 Atlantic Trust Bldg., Norfolk, Va., U. S. A.

Toronto Automobile Club.—P. E. Doolittle, Pres., Toronto, Ont., Canada.

Union County Automobile Association.—W. H. P. Veysey, Sec., Plainfield, N. J., U. S. A.

Vandergrift Automobile Club.—E. L. Hoofring, Sec., 172 Franklin Ave., Vandergrift, Pa., U. S. A.

Watertown Automobile Club.—L. G. DeCant, Pres., Watertown, N. Y.; U. S. A.

Club List (Continued)

Wachusett Automobile Club.—L. H. Greenwood, Sec., Gardner, Mass., U. S. A.

Weld County Automobile Club, The.—Frank I. Ewing, Sec., Greeley, Colo., U. S. A.

Westchester Motor Club.—A. B. Barkman, Sec., Tarrytown, N. Y., U. S. A.

Martinsburg Automobile Club.—X. Poole, Sec., Martinsburg, W. Va., U. S. A.

Whitewater Automobile Club.—T. M. Blackman, Sec., Whitewater, Wis., U. S. A.

Wilkesbarre Automobile Club.—Dr. E. C. Wagner, Sec., 125 S. Washington St., Wilkesbarre, Pa., U. S. A.

Wichita Automobile Club.—Scott Wynne, Sec., Wichita, Kan., U. S. A.

Milwaukee Automobile Club.—James T. Drought, Sec., Milwaukee, Wis., U. S. A.

Worcester Automobile Club.—F. E. Frost, Sec., 44 Front St., Worcester, Mass., U. S. A.

Youngstown Automobile Club.—Geo. L. Fordyce, Sec., Youngstown, O., U. S. A.

Yale University Automobile Club.—G. H. Townsend, Sec., New Haven, Conn., U. S. A.

Long Island Automobile Club Membership

(Received too late to be placed in Club Section)

Abrahams, Lawrence; Adams, Louis R.; Ackerson, P. T.; Adrience, Benjamin; Aeby, A. E.; Aitken, Arthur E.; Allen, Lew H.; Allen, Z. Nelson; Allen, Isaac L.; Alderman, Allen C.; Alvarez, Manuel; Alvord, Dean; Andrews, Herbert G.; Ansbacker, Louis A.; Appleton, Herbert; Arnold, C. G.; Arnold, Wm.; Asbury, Clement B.; Ashforth, Edward.

Bachman, Godfrey H.; Bailey, John; Bailey, Hon. Joseph; Bainbridge, Henry C.; Bainbridge, Richard W.; Bancker, Andrew O.; Bancker, Edward H.; Bاندell, F. D.; Barnes, G. H.; Barnum, E. H.; Bayha, Edwin; Beard, William; Beecher, William C.; Bedford, F. H.; Berry, Dr. E. M.; Berry, F. D.; Beguelin, H. R.; Beitter, E.; Bell, Hon. James D.; Bellows, Dr. Chas. M.; Bennett, Elbert A.; Bergen, DeWitt; Bergen, E. J.; Bickford, L. M.; Blaisdell, W. F.; Blanchard, A. W.; Bohack, Henry C.; Bossett, John; Bourne, F. G.; Bradt, George S.; Brinker, Edward B.; Bristol, James Edward; Britton, George P.; Bristow, Dr. A. F.; Brower, Edward S.; Brower, Alex R.; Brown, Norman A.; Bulkley, Washington; Bulkley, Harrie; Bunnell, K. Eugene; Burns, Samuel H.; Butler, Dr. W. E.; Butler, Thomas.

Campbell, Dr. W. F.; Cannon, George C.; Carlson, Conrad; Carlson, Chas. A.; Carman, Chas. W.; Carrie, F. G.; Carter, O. Everett; Cartlidge, J.; Case, Mrs. C. S.; Cheseborough, Albert; Cheseborough, Thomas F.; Childs, W. H.; Childs, J. W.; Childs, G. W.; Chruster, P. C.; Church, James C.; Clark, J. A.; Clark, Dr. Raymond; Clarke, Audley; Class, W. G. F.; Clay, George E.; Cluff, Charles C.; Cochran, Dr. H. L.; Colby, Thomas E.; Colson, W. C.; Cook, Dr. Frank W.; Cooper, Frank; Copland, George W.; Courtney, Wm. C.; Cropsey, G. W.; Cunningham, P. J.; Curtis, Miss F.; Curtis, N. W.

Dale, Chalmers; Damron, W. C.; Day, A. M.; Day, Edmund; De Bevoise, Augustus N.; De Bevoise, W. W.; De Fere, Paul E.; Delatour, Dr. H. Beeckman; De Mund, Dr. John E.; De Mott, J. W.; Deringer, Henry; Disbrow, J. Pell; Ditmas, Chas. A.; Dodge, Philip T.; Dunham, H. N.; Dykes, Joseph.

Edwards, Chas. Jerome; Elliott, Clinton; Elliott, Gilbert; Emanuel, Jr., J. H.; Engeman, Wm. A.; Eustace, John C.; Evans, Frank L.; Evans, F. H.

Fairchild, J. P.; Fairfax, H. W.; Field, Russell A.; Fink, August D.; Finn, Ed-

gar N.; Fiske, Dr. Edwin H.; Fitall, John C.; Fitzimons, Geo.; Foale, H. James; Freeman, W. Winans; Friedmann, H. G.; Frink, J. K.; Frith, Francis E.; Fuller, A. L.

Galbraith, C. C.; Galt, C. H.; Gibb, Arthur; Gillispie, Earl A.; Godfrey, E. S.; Grace, James J.; Grahls, Dr. F. L.; Grant, F. L.; Greene, Edward S.; Greene, Max R.; Guild, Chas. H.

Holliday, Read; Haight, George F.; Harrington, D. F.; Hart, Charles F.; Hatch, Frederic H.; Hawley, Edward E.; Hawkins, Glenwood; Hayward, William T.; Healy, Henry W.; Healy, Raymond; Hegeman, Jr., J. R.; Heimann, F. W.; Herdrix, Clifford R.; Herrmann, Charles; Herman, John; Hervey, C. S.; Hitchings, Benjamin G.; Higgins, Chas. M.; Hill, John M.; Hodenpyl, Anton G.; Holton, Gene C.; Hopkins, L. A.; Hopkins, Waldron; Howe, Dr. A. C.; Howell, Roy G.; Hoye, Stephen M.; Hughes, Dr. Peter; Humphreys, C. H.; Humpstone, Dr. O. P.; Hunt, Louis T.; Hunter, Dr. V. L.; Hunter, S. E.; Hulse, W. E.; Husted, Miss Katherine M.; Hyatt, H. O.

Ingalls, Charles H.; Irwin, Louis H.; Ivie, Alvin E.

Jaack, Hector C.; James, John F.; Jahn, F. G.; Jantzer, Theodore; Jewell, E. H.; Jewett, Dr. Charles; Jones, Arthur C.; Jordan, Jr., Edward B.

Kaiser, George M.; Keller, J.; Kelsey, R. G.; Kent, Horace L.; Kenyon, Clarence A.; King, Dr. S. T.; Kirkam, I. C.; Kissam, W. Allen; Kistler, Milton S.; Knight, Thomas G.; Kohart, F. C.; Kouwenhoven, Wm. H.; Kryn, Henry.

Lachicotte, Walter B.; Lampe, Frederick; Lamphear, E. M.; Lannin, Jos. J.; Latimer, G. Byron; Leahy, D. F.; Lefferts, Dwight C.; Lefferts, Leffert; Lemmerman, F. G.; Light, Charles; Lindridge, Dr. E. F.; Lineberger, P. N.; Linkletter, George O.; Litchfield, Cleveland; Little, Dr. Frank; Little, Dr. George; Logan, W. J.; Loomis, Guy; Lusher, Walter R.; Lynes, D. W.

McCorkle, Dr. J. A.; McCormac, Edward J.; McCutcheon, H. G.; McDonald, Albert; McKeefrey, John; Mackay, Alfred; Maddock, Sidney; Magaw, Robert; Marlborough, M. F.; Martin, H. C.; McLaughlin, D. M.; Martin, Walter C.; Martin, D. D.; Martin, Homer G.; Marshall, W. W.; Mason, H. Edgar; May, John; Melvin, W. W.; Melvin, Edwin; Mendell, Wilson R.; Mendes, Frank E.

Long Island A. C. (Continued)

Meserole, George H.; Mesier, Rev. H.; Metz, Hon. Herman A.; Meyer, Cord A.; Milhan, O. H. A.; Miller, Charles A.; Moore, W. F.; Morris, W. Cullen; Morse, Theodore; Mosher, Burr Burton; Moss, Dr. L. Howard; Moulton, Arthur; Munger, W. B.; Murphy, A. J.; Murphy, Alexander D.; Musson, George T.

Napier, Thomas; Nelson, C. N.; Neyland, H. A.; Nicholson, George; Nollman, Walter P.; Norwood, H. M.

Oeland, I. R.

Page, C. H.; Palmer, H. U.; Palmer, Jr., Lowell M.; Palmer, H. W.; Pardee, Dwight W.; Pardington, A. R.; Pardee, Roy E.; Parker, Dr. C. B.; Parker, Dr. DeWitt L.; Parker, Dr. Virgil F.; Patterson, George; Paulsen, Henry; Peck, C. C.; Peet, A. J.; Pell, H. H.; Peirson, Edward E.; Perrine, Russell J.; Philips, F. W.; Pidgeon, Edward; Pierson, Walter G.; Pierson, Harry; Pigot, J. N.; Pinover, J. R.; Pinney, D. C.; Powers, George A.; Pratt, Herbert L.; Pratt, George D.; Pray, Charles F.; Preston, W.; Preston, W. H.; Price, Walter D.; Price, Dr. H. R.; Prior, J. E.; Pulis, C. H.

Randolph, G. B. F.; Raymond, H. H.; Raymond, A. B.; Reeder, Louis P.; Redman, W. H.; Reid, Willard P.; Reuter, Albert; Richardson, Wm. Payson; Riley, E. G. B.; Ris, Lester I.; Robbins, Jeremiah; Robinson, George N.; Rogers, Mrs. Julia F.; Ropes, Chapman; Ross, S. B.; Rourke, Joseph D.; Rouss, P. W.; Russell, Dr. P.

St. John, Robert P.; Salmon, Hamilton H.; Schaap, A. K.; Schimpf, William; Scudder, W. S.; Seal, Harry E.; Seaman, A. W.; Seaman, Eliz. Cochrane; See, Alonzo B.; Seward, Percival H.; Sharp, L. B.; Sharpe, Dr. F. M.; Shel-

Long Island A. C. (Continued)

don, Alexander J.; Shepard, Levi D.; Sheppard, Dr. J. E.; Sherwood, R. E.; Schomaker, J. W.; Sicard, Charles Louis; Simpson, James S.; Sleigh, A. H.; Smart, I. H.; Smith, Albert E.; Smith, Chas. Randolph; Smith, Dr. A. H.; Smith, Edward P.; Smith, Louis H.; Snow, Henry Sanger; Snyder, Harry F.; Southworth, A. G.; Spiero, M.; Spitzer, Oliver; Spott, Edward; Sproule, P. N.; Steers, Alfred E.; Stenson, Samuel; Stephens, Benjamin F.; Stephenson, F. B.; Stephenson, Jr., George G.; Stine, John R.; Stratton, Gilbert M.; Stratton, Jr., Edward; Strong, E. R.; Stryker, William H.; Sutton, J. W.; Suydam, Barnare; Swentzel, Rev. Henry C.; Swett, Samuel; Sykes, Walter F.

Tegethoff, C. C.; Thatford, G. S.; Thompson, Frederic; Tiffany, C. H.; Tinker, Giles K.; Tollner, Jr., Hugo; Tomlins, Jr., W. M.; Travis, Hon. Eugene M.; Trommer, George F.

Underwood, John T.

Valentine, David H.; Vanderbilt, Jr., Wm. K.; Vandeveer, J. H.; Van Buskirk, C. R.; Vendig, J. H.; Vogel, William H.; Voorhies, E. W.; Voorhees, Dr. John A.; Vose, C.

Waldron, W. C.; Waring, W. L.; Warner, W. J.; Warnke, Frederick; Watson, Jesse; Webb, F. G.; Webster, W. L.; Weck, Edward; Weed, William S.; Weiss, Louis T.; Weir, Levi C.; Werner, Charles; Whalen, Robert T.; White, E. L.; Whitley, Frederick Nelson; Wichert, Joseph H.; Wilcox, A. Neil; Wilkey, Joseph; Williamson, Chas. R.; Williams, Harry P.; Willis, E. J.; Willets, Edwin C.; Wilmarth, Alfred; Winthrop, Henry Rogers; Winslow, Arthur S.; Wintringham, W. T.; Wolfe, M. J.; Woodhull, Gilbert B.; Worthen, H. B.; Wyckoff, F. L.

Zabriskie, H. L.; Zimmerman, John C.

Classified Trade Directory

ABSORBERS—SHOCK

Acme Spring Check Co.—1717 Broadway, New York City.
Amy's Patent.—3 rue du Pas-de-la-Mule, Paris, France.
Baldwin Chain & Mfg. Co.—194 Chandler St., Worcester, Mass.
Bernard et Patoureaux.—71 bvd. Beaumarchais, Paris, France.
Comstock Shock Absorber Co., The.—1661 Broadway, New York City.
Continental, Société Anonyme.—116 ave Malakoff, Paris, France.
Diezmann Shock Absorber Co.—1311 Hudson St., Hoboken, N. J.
Dutrieux-Lamelin.—Le Quesnoy, Nord, France.
F. R. V. Auto Parts Co.—116 Nassau St., New York City.
Gabriel Horn Mfg. Co.—934 Hamilton Ave., N. E., Cleveland, O.
Gould Derby Mfg. Co.—109 N. Broad St., Trenton, N. J.
Graham & Goodman.—51-55 W. 93rd St., New York City.
Hartford Suspension Co.—67 Vestry St., New York City.
Hercules Auto Specialty Mfg. Co.—115 Dearborn St., Chicago, Ill., and 936 Denver Ave., Los Angeles, Cal.
Herz & Co.—203-205 Laffayette St., New York City.
Hotchkiss Mfg. Co., The.—1262 Michigan Ave., Chicago, Ill.
Indianapolis Bolster Spring Co.—326 W. Georgia St., Indianapolis, Ind.
Kilgore Mfg. Co.—Old Town, Maine.
Knohaert.—Frelinghien, Nord, France.
Lesfils de Peugeot freres.—Valentigney, Doubs, France.
Maison Talbot.—156 ave. Malakoff, Paris, France.
Minion, René.—53 rue de Villiers, Neuilly sur-Seine, France.
Oil Tempering Spring Co.—Chicopee Falls, Mass.
Panhard et Levasser, Société.—19 ave d'Ivry, Paris, France.
Ruckert Compound Shock Absorber Co.—66 Leonard St., New York City.
Sager Co., J. H.—Rochester, N. Y.
Sans, J. B.—10 rue de l'Oasis, Puteaux, France.
Shippey, Geo. E.—Pittsfield, Mass.

ABSORBERS—SHOCK (Continued)

Société Anonyme d'Inventions Automobiles.—41 rue St. Ferdinand, Paris, France.
Société Westinghouse.—45 rue de l'Arcade, Paris, France.
Spiral Spring & Auto Co.—1709 Broadway, New York City.
Stolp Guaranteed Shock Absorber.—20-22 Fletcher St., Brooklyn, N. Y.
Supplementary Spiral Spring Co.—4528-4530 Delmar Ave., St. Louis, Mo.
Triple Action Spring Co.—1254 Michigan Ave., Chicago, Ill.
Vestal Shock Absorber Co.—Baum and Whitfield Sts., E. E., Pittsburg, Pa.
Victor Shock Absorber Co.—1937 Broadway, New York City.
Vigneaux, C.—5 rue Bacon, Paris, France.
Weeber Mfg. Works, C. F.—170-172 Central Ave., Albany, N. Y.
Willyoung Appliance Co.—Ludlow Station, Yonkers, N. Y.

ACID—SULPHURIC

Kalbfleisch Co, Franklin H.—Broadway and Sixteenth St., New York City.

ALCOHOL—DENATURED

Gray & Co., Wm. S.—76 William St., New York City.
United States Industrial Alcohol Co.—100 William St., New York City.
Webb & Son, James A.—50-52 Stone St., New York City.

ALUMINUM

Aluminum Co. of America.—Niagara Falls, N. Y.
Aluminum Co. of America.—Pittsburg, Pa.
Aluminum Foundry Co.—Manitowoc, Wis.
Bridgeport Deoxidized Bronze & Metal Co.—Bridgeport, Conn.
Buckeye Iron & Brass Works.—324 E. 3rd St., Dayton, O.
Buffalo Aluminum Co.—442 Ellicott Sq., Buffalo, N. Y.
Clum & Atkinson.—575 Lyell Ave., Rochester, N. Y.
Electric Smelting & Aluminum Co.—Lockport, N. Y.
Enterprise Foundry Co.—Detroit, Mich.
Ferree, E. H.—Market St., Lockport, N. Y.

ALUMINUM (Continued) . . .

- Keystone Brass Foundry Co.**—188 Berks St., Philadelphia, Pa.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
New Jersey Aluminum Co.—19th and Springfield Aves., Newark, N. J.
Oberdofer Brass Co., M. L.—804 E. Water St., Syracuse, N. Y.
United States Aluminum Castings Co.—Hamilton and Vandalia Aves., Cincinnati, Ohio.
United States Aluminum Co.—Pittsburg, Pa.
United States Bronze Co.—149 Columbus St., Cleveland, O.

ALUMINUM CASTINGS, see CASTINGS, ALUMINUM, BRASS, BRONZE AND COPPER

AMMETERS

- American Coil Co., Inc.**—Cor. Wall and Cocasset Sts., Foxboro, Mass.
American Electrical Novelty & Mfg. Co.—308 Hudson St., New York City.
Atwater Kent Mfg. Works.—50 N. 6th St., Philadelphia, Pa.
Auto Specialty Co.—6 E. Madison St., Chicago, Ill.
Connecticut Telephone & Electric Co., Inc.—70 Britannia St., Meriden, Conn.
Eastern Carbon Works.—West Bergen, Jersey City, N. J.
Eldredge Electric Mfg. Co.—7 Post Office Square, Springfield, Mass.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
General Electric Co.—Schnectady, N. Y.
Keystone Electrical Instrument Co.—9th St. and Montgomery Ave., Philadelphia, Pa.
Knoblock-Heideman Mfg. Co.—South Bend, Ind.
Monarch Instrument Co.—Cleveland, O.
More Power Co.—619 Gorham St., Lowell, Mass.
Never-Miss Spark Plug Co.—321-323 Michigan Ave., East Lansing, Mich.
Norton Electrical Instrument Co.—Manchester, Conn.
Pignolet, Louis M.—78 Cortlandt St., New York City.
Pocket Meter Co.—Bluffton, Ohio.
Queen & Co., Inc.—8th and Arch Sts., Philadelphia, Pa.
Robert Instrument Co.—49 Shelby St., Detroit, Mich.
S. E. I. Co.—Syracuse, N. Y.
Stackpole Battery Co.—St. Mary's, Pa.
Stanley Electric Mfg. Co.—Pittsfield, Mass.
Sterling Mfg. Co.—416 American Trust Bldg., Cleveland, O.
Talmont Electrical Engineering Co.—88-90 Centre St., New York City.

AMMETERS (Continued)

- Wagner Electrical Mfg. Co.**—St. Louis, Mo.
Western Electric Co.—259 S. Clinton St., Chicago, Ill.
Westinghouse Electric & Mfg. Co.—Pittsburg, Pa.
Weston Electrical Instrument Co.—Newark N. J.
Whitney Electrical Instrument Co.—Concord, N. H.
Williams, E. Q.—533 S. Clinton St., Syracuse, N. Y.

ANNUNCIATORS

- Chicago Battery Co.**—Michigan Ave. & 14th St., Chicago, Ill.
Cowles & Co., C.—New Haven, Conn.
Electric Signs & Signals Co.—177 E. 87th St., New York City.
Joseph & Co., W. R.—499 Clinton St., Buffalo, N. Y.
Jones Speedometer Co.—Broadway, at 76th St., New York City.
Saxon Lamp Co.—526-532 W. 28th St., New York City

APRONS—STORM

- Automobile Equipment Co.**—264 Jefferson Ave., Detroit, Mich.
Auto Top Co.—209 E. Columbia St., Fort Wayne, Ind.
Detroit Motor Car Supply Co.—1250 Jefferson Ave., Detroit, Mich.
Eneas, A. G.—50 Congress St., Boston, Mass.
Gilbert Mfg. Co., The.—New Haven, Conn.
Kroh Mfg. Co., C. Z.—Toledo, O.
Motor Top Co. of New York.—216 W. 50th St., New York City.
Nathan Novelty Mfg. Co.—88 Reade St., New York City.
National India Rubber Co.—Bristol, R. I.
Perfection Storm Shield Co.—Clyde, O.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
Safe Storm Shield Co.—Fremont, O.
Vehicle Apron & Hood Co.—Columbus, O.
Vehicle Top & Supply Co.—900 Cass St., St. Louis, Mo.
Warner Pole & Top Co.—1655 Central Ave., Cincinnati, O.
Wiley & Son Co., Wm. H.—Hartford, Conn.
Wood & Son, Frederick R.—219 W. 19th St., New York City.

ASBESTOS

- Asbestos Mfg. Co.**—Philadelphia, Pa.
Carey Mfg. Co., R. M.—Lockland, O.
Gilmour Mfg. Co., R. M.—105 John St., New York City.

ASBESTOS (Continued)

- Goodwin & Kintz Co.**—20 Ramley St., Winsted, Conn.
Johns-Manville Co., H. W.—100 William St., New York City.
Keasby & Mattison Co.—Ambler, Pa.
Keasbey Co., Robert A.—141 Ellicott St., Buffalo, N. Y.
New Jersey Asbestos Co.—Camden, N. J.
New York Asbestos Mfg. Co.—123 Cortland St., New York City.
Penfield & Co., A. B.—7 Terrace St., Buffalo, N. Y.
Watson Co., H. F.—Erie, Pa.

AUTOMOBILE AGENTS AND DEALERS

- Abbot's Garage.**—Fort Worth, Texas. (Buick); garage.
Abbott, W. H.—Hudson, Michigan. (Jackson.)
Aberdeen Auto Co.—Aberdeen, So. Dakota. (Cadillac.)
Acme Auto Co.—310 Liberty St., Troy, N. Y. (Mora.)
Acme Automobile Co.—3944-46 Olive St., St. Louis, Mo. (Reo.)
Acme Garage Co., Inc.—13th St. and Tacoma Ave., Tacoma, Wash. (Buick, Cadillac, Knox.) Garage.
Active Auto Co.—605 Van Ness Ave., San Francisco, Cal. (Mora, Commerce, Detroit.)
Adams & Engs.—1712 Michigan Ave., Chicago, Ill. (Earl, Frayer Miller.)
Adams & Hart.—47 N. Division St., Grand Rapids, Mich. (Indian, Franklin, Elmore, Peerless.)
Adams Automobile Co.—Winona, Minn. (Cadillac.)
Adams, Henry J.—Tiffin St., Fostoria, N. Y. (Reo.)
Adamson, Prescott.—N. W. cor. Broad and Spring Garden St., Philadelphia, Penn. (Columbia); repairing.
Adams, S. L.—Joplin, Mo. (Cadillac.)
Adams, W. J.—Hanover, Pa. (Maxwell.)
Adirondack Auto Co.—Lake Placid, N. Y. (Cadillac, Thomas, Indian.)
Adland Motor Co.—900-902 Madison St., Chicago, 1 (Lambert.)
Aerocar Co.—70 roadway, Cincinnati, Ohio, Reo.)
As Lumber & Mercantile
 Aguascalientes, Mex. (Buick,
 -Cochabamba, Bolivia.
 er, F. W.—Fredericksburg, Tex.
 atham.)
 .. Automobile Garage.—Cor. Main
 Cedar Sts., Akron, O. (Franklin,
 ton.)

- Albany Garage Co.**—28 Howard St., Albany, N. Y., and Troy, N. Y. (Peerless, Matheson, Isotta, Stevens-Duryea); garage; repairing; supplies.
Albany Hdwe & Specialty Co.—Albany, Wis. (Waltham.)
Albaugh Bros., Dover & Co.—Marshall Blv'd and 21st St., Chicago, Ill. (Sterling Star.)
Albercrombie, C. R.—Kansas City, Missouri. (Monarch.)
Alberta Motor Co.—Medicine Hat, Alta., Canada. (Maxwell.)
Albertson, C. C.—540 Washington St., Camden, New Jersey. (Autocar.)
Albright Auto Co.—Crawfordsville, Ind. (National.)
Albuquerque Cycle & Arms Co.—115 Gold St., Albuquerque, New Mexico. (Winton, Waltham.)
Alderman & Son, D. W.—Alcoln, S. C. (Cadillac.)
Aldrich & Burbank.—St. Johnsbury, Vt. (Stanley.)
Allegheny Auto Co.—711 Jackson St., Allegheny, Pa., and Pittsburg, Pa. (Rapid, Glide, Austin.)
Allen, Alex.—Chestnut Hill, Pennsylvania. (Cadillac.)
Allen, Asten & Co.—Greenwich Ave., Greenwich, Conn. (Locomobile, Reo.)
Allen Co., I. M.—116 South Portland St., Brooklyn, N. Y. (Stevens-Duryea.)
Allen, J. A.—372 Smith St., Providence, R. I. (Northern.)
Allen-Kingston Motor Car Co.—3 W. 44th St., New York City. (Allen-Kingston.)
Allen Motor Co.—42 Preble St., Portland, Maine. (Cameron, Monarch.)
Allen, Will, Dr.—Billings, Montana. (Wayne.)
Alley & Gardner.—Tahoka, Tex. (Buick.)
Alliance Motor Car Co.—Court St., Alliance, O. (Jackson.)
Alling & Fields.—331 Lyon St., Dunkirk, New York. (Maxwell.)
Altland, M. J.—Alpena, Mich. (Cadillac, Northern.)
Altoona Motor Car Co.—718 Green Ave., Altoona, Pa. (Rambler, Reo, Ford, Jackson.)
Amarillo Auto Co.—Wichita, Kan. (Maxwell.)
Ambrose, Dr. O. A.—6125 Bartmer Ave., St. Louis, Mo. (Moline.)
American Automobile Co.—Minneapolis, Minn. (Stoddard-Dayton.)
American Automobile Co.—Houston, Tex. (American.)
American Automobile Co.—S. 2nd and St. Helens Ave., Tacoma, Wash. (Reo, Stoddard-Dayton.)
American Automobile Co.—Cedar Rapids, Iowa. (American.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

American Automobile Co.—St. Clair and Ontario St., Cleveland, O. (Maxwell, Aerocar.)
American Automobile Co.—5928 Baum St., Pittsburg, Pa. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
American Auto Garage.—933 No. 7 St., Philadelphia, Pa. (American.)
American Auto Machine Co.—1927 First Ave., Seattle, Wash. (Mitchell.)
American Garage Co.—5123 Delmar Ave., St. Louis, Mo. (Dragon.)
American Locomotive Automobile Co.—Broadway and 62d St., New York City. (Berliet.)
American Motor & Cycle Co.—Battle Creek, Mich. (Buick, Franklin.)
Amidon, L. H.—Wheaton, Minn. (Waltham.)
Amos Pierce Auto Co.—109 State St., Syracuse, N. Y. (Stevens-Duryea, Peerless); repairing.
Anders & Van Heck.—Stevens Point, Wis. (Rambler.)
Anderson Auto Co.—41 Downer Pl., Aurora, Ill. (Rambler, White); garage; repairing; supplies.
Anderson Automobile Co.—Woonsocket, R. I. (Cadillac, Maxwell.)
Anderson Bros.—117 Front St., Marietta, O. (Buick.)
Anderson, F. W.—467 Madison Ave., Albany, N. Y. (Indian.)
Anderson, W. F.—7th and Harrison St., San Francisco, Cal. (Reliance.)
Andress, H. M.—635 W. Broad St., Elyria, O. (Queen.)
Andrews & Fite.—Georgetown, O. (Jewel.)
Andrews, Chas. A.—Winchendon, Mass. (Reo, Jackson, American Mercedes.)
Andrews, Dr. W. W.—Phillipsburg, Pa. (Cadillac.)
Andrews, Rolland B.—Leominster, Mass. (Rambler.)
Angrove Bros.—88-90 Princess St., Kingston, Ont., Canada. (Russell, Oldsmobile.)
Anniston Hdwe. Co.—1118 Noble St., Anniston, Alabama. (Buick.)
Anthony, Chas. S.—112 E. 9th St., Los Angeles, Cal. (Federal.)
Anthony, R. S.—Fresno, Cal. (Jewel.)
Apgar, M. H.—Summit, N. J. (Maxwell.)
Appleby & Dill.—Spotwood, N. Y. (Maxwell.)
Archer & Co.—1597 Broadway, New York City (Hotchkiss.)
Argus Import Co.—17 E. 34th St., New York City. (Argus.)
Arkansas Automobile Co.—Little Rock, Ark. (Cadillac, Oldsmobile.)
Arlington Motor Car Co.—5969 Center Ave., Pittsburg, Pa. (Jackson, Acme.)

Armory Garage.—Franklin St., Lynn, Mass. (Jackson.)
Armstrong, Calvin R.—Lock Haven, Pa. (Buick, Cadillac, Franklin, Pope-Toledo.)
Army Cycle Mfg. Co.—130-32 Meeting St., Charleston, S. C. (Cadillac, Buick); garage; repairing.
Arnold, T. N.—Haverhill, Mass. (Premier.)
Arthur & Flessel.—Huntington, New York. (Waltham, Peerless.)
Artzbarger, W. H.—Milroy Ave., Allegheny, Pa. (Model.)
Arverne Automobile Garage.—Arverne, N. Y. (Glide.)
Asay, J. E.—Rock Island, Ill. (Jewel.)
Asher, W. J.—Main St., Willimantic, Ct. (Rambler.)
Asheville Cycle & Auto Co.—15 Lexington Ave., Asheville, N. C. (Cadillac, Knox); garage, repairing.
Ashland Auto Garage.—87 Ashland Blvd., Chicago, Ill. (Auburn.)
Ashley, W. G.—Olympia, Washington. (Indian.)
Ashwell, Robt.—45 Vine St., Hartford, Conn. (Franklin.)
Aster Co.—1610 Broadway, New York City. (Aster.)
Aston, T. R.—Bridgeport, Conn. (Wayne.)
Atkins & Ellwood.—Elkhart, Indiana. (American Simplex.)
Atkinson Auto & Garage Co.—Ashley Bldg. Lockport, N. Y. (Maxwell.)
Atkinson, J. E.—Springfield, Mo. (Cadillac.)
Atlanta Phonograph Co.—Atlanta, Ga. (Waltham.)
Atlantic Auto Co. & Machine Wks.—N. Carolina Ave., Atlantic City, N. J. (Premier, Delaunay-Belleville, Mitchell.)
Atlantic Motor Car Co.—1776 Broadway, New York City. (Stoddard-Dayton; repairing.)
Atlas Automobile Co.—College and Ellsworth Ave., Pittsburg, Pa. (Maxwell, Premier, Chadwick.)
Attleboro Automobile Co.—74 Union St., Attleboro, Mass. (Stanley, Stearns, Autocar, Stevens-Duryea, Pierce-Arrow.)
Atwood, A.—Plymouth, Mass. (Waltham.)
Atwood Automobile Co.—2 St., Toledo, O. (Franklin, El Pope-Hartford, Pope-Waverly)
Auburn Auto Co.—1312 Staun Washington, D. C. (Auburn.)
Auburn Automobile Co.—60 Water Auburn, N. Y. (Franklin, Pope-Hartford, Royal, Northern, Peerless); age; repairing; supplies.
Auger, Frank N.—Bloomington : Streator, Ill. (Ford.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Auld, W. C.—Green Valley, Illinois. (Holsman.)
Aurora Automobile Co.—Aurora, Neb. (Mitchell.)
Austin Agency, Inc.—Motor Mart, Park Sq., Boston, Mass. (Austin.)
Austin Automobile Co.—484 Broad St., Newark, N. J. (Ford.)
Austin, R. S.—El Paso, Tex. (Thomas Flyer.)
Auto & Motor Boat Co.—1205 Capitol Ave., Houston, Texas. (Cameron.)
Auto & Motor Co.—Park Ave. and Bid-
 dle St., Baltimore, Md. (Mitchell,
 Rambler, Queen.)
Auto Agency & Supply Co.—San An-
 tonio, Tex. (Waltham.)
Auto Arcade Co.—164 W. 46th St., New
 York City. (Second-hand cars.)
Autocar Co.—249 No. Broad St., Phil-
 adelphia, Pa. (Autocar.)
Autocar Sales Co.—Broadway and 80th
 St., New York City. (Autocar.)
Auto Co. of California.—387 Golden Gate
 Ave., San Francisco, Cal. (Knox
 trucks.)
Auto Cycle Equipment Co.—Michigan
 City, Ind. (Jackson.)
Auto Electric Co.—41 County St., At-
 tleboro, Mass. (Ford.)
Auto Exchange.—501 Broadway, Mil-
 waukee, Wis. (Jackson.)
Auto Garage.—Pomona, Cal. (Rambler.)
Auto Garage Co.—Meyersdale, Pa.
 (Maxwell.)
Auto Garage & Repair Co.—198 Ellison
 St., Paterson, N. J. (Manhattan.)
Auto Import Co.—90 Stanley St., Mon-
 treal, Canada. (Humber.)
Auto Import Co.—1786 Broadway, New
 York City (Rochet-Schneider); re-
 pairing.
Auto Livery.—1313 Irving St., Philadel-
 phia, Pa. (Elmore.)
Auto Livery & Express Co.—S. 10th and
 Tacoma Ave., Tacoma, Washington.
 Maxwell, Johnson.)
Auto Livery Co.—Golden Gate and Van
 Ness Aves., San Francisco, Califor-
 nia. (Peerless, Matheson.)
Auto Mch. & Repair Shop.—176 East
 Main St., Wilkes-Barre, Pa. (Winton.)
Auto Machine Works.—Corona, Cal.
 (Ford); garage; repairing.)
Machine Wks. & Garage.—413 So.
 St., Leavenworth, Kan. (Ford.)
Maintenance Co.—1141 S. Broad
 Philadelphia, Pa. (Riviera.)
Mobile & Supply Co.—24 Temper-
 ance St., Toronto, Canada. (Stoddard-
 ton, Pierce-Arrow, Franklin, Royal,
 Pope-Hartford.)
Mobile & Supply Corp.—67-9
 Broadway, New Haven, Conn. (Buick,
 comobile.)

Automobile & Garage Co.—Paducah,
 Ky. (Queen, Reo.)
Automobile & Machinery Co.—221 2d
 St., Macon, Ga. (Buick, Pope-Waver-
 ley, Autocar, Oldsmobile, Pope-To-
 ledo.)
Automobile Co. of Hamilton, Ltd.—
 York and Queen St., Hamilton, Can-
 ada. (Ford, Russell.)
Automobile Co.—112 Tulane Ave., New
 Orleans, La. (Locomobile, Winton.)
Automobile Co.—195 Paterson St., Pat-
 erson, N. J. (Winton, Waltham.)
Automobile Exchange, The.—Salt Lake
 City, Utah. (Jackson.)
Automobile Exchange & Storage Co.—
 133-139 W. 38th St., New York City.
 (2nd hand cars.) Garage; repairing.
Automobile Exchange.—Corner Ave. D
 and 20th St., Birmingham, Ala. (Ford,
 Pope-Waverley, National, Baker.)
Automobile Garage & Repair Co.—
 Painesville, O. (Winton.)
Automobile Maintenance Co.—1239 Ful-
 ton St., Broadway, New York City.
 (Dolson; 2nd-hand cars.)
Automobile Renting Co.—St. Louis, Mo.
 (Atlas.)
Automobile Repair Co.—Kossuth St.,
 Bridgeport, Conn. (Knox.)
Automobile Sales Corp. of New York.—
 1665 Broadway, New York City.
 (American Mercedes.)
Automobile Stor. & Trading Co.—97
 Central Ave., Albany, N. Y. (Colum-
 bus, Oldsmobile.)
Automobile Transit Co.—Milwaukee,
 Wis. (Gale.)
Auto Motor Car Co.—804-8 Sycamore
 St., Cincinnati, O. (Berliet, Rainier,
 Welch, Stoddard-Dayton, Baker, Rapid,
 Couple-gear); repairing; garage.
Auto Motor Co.—Baltimore, Maryland.
 (Maxwell.)
Auto Outing & Transit Co.—Baltimore,
 Maryland. (Buick.)
Auto Repair Co.—559 7th Ave., Pitts-
 burg, Pa. (Corbin, Haynes.)
Auto Selling & Repair Co.—304 North-
 Western Bldg., Minneapolis, Minn.
 (Dragon.)
Auto Seiling and Supply Co.—15 4th St.,
 New Bedford, Mass. (Maxwell.)
Auto Shop Co.—731 Vincent Ave.,
 Cleveland, O. (Thomas Flyer,
 Thomas Detroit, Franklin); repairing;
 garage.
Auto Shop.—448 Broadway, Paterson,
 N. J. (Columbia, Stevens-Duryea,
 White.)
Auto Storage & Trading Co.—Albany,
 N. Y. (Thomas Flyer.)
Auto Supply & Storage Co.—1416 Mad-
 ison Ave., Baltimore, Md. (National,
 Lambert, Holsman, Logan, Jewel,
 Studebaker electric.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Auto Transit & Repair Co.—East 5th St., Canton, O. (Jackson.)
Auto Transit & Repair Co.—Milwaukee, Wis. (Jackson.)
Auto Vehicle & Supply Co.—1841 Market St., San Francisco, Cal. (Rapid.)
Auto Vehicle Co.—540 Golden Gate Ave., San Francisco, Cal. (Tourist.)
Auto Vehicle Co.—10th and Main Sts., Los Angeles, Cal. (Atlas trucks, Tourist.)
Avery, F. E.—1199 Franklin Ave., Columbus, O. (Packard, Franklin, Winton); repairing.
Avis & Son, G. F.—Hudson, Michigan. (Buick.)

B.

Babb, W. D.—820 Cass St., La Crosse, Wis. (Pope-Hartford.)
Babcock & Son.—Watertown, S. Dak. (Ford.)
Babcock, Dr. Myron L.—Julesburg, Colo. (Waltham.)
Babcock Electric Carriage Co.—1591 Broadway, New York City. (Babcock.)
Babcock Hdwe. Co., A. L.—Billings, Mont. (Dragon.)
Babcock, J. P.—Boonville, N. Y. (Waltham.)
Babcock, W. L.—Elk River, Minn. (Buick.)
Bachelor, C. A.—Angola, Ind. (Buick.)
Baer, Roy R.—310 1st Ave., Sterling, Ill. (Cartercar.)
Bagnall Auto Co.—4152 Olive St., St. Louis, Mo. (Cadillac.)
Baige & Co., Wm.—Bloomfield, Neb. (Holsman.)
Bailey Co.—Cleveland, O. (Oldsmobile.)
Bailey, Fred F.—Schroon Lake, N. Y. (Waltham.)
Bailey, George.—421 Clinton St., Milwaukee, Wis. (Lambert.)
Bain, Walter & Manley.—Oakland, Cal. (Glide.)
Baird & Swan.—Norwich, Conn. (Cadillac, Oldsmobile, Pope-Toledo, Pope-Hartford, Pope-Waverly.)
Baisley, F. H.—10 Crane St., Danbury, Conn. (Cameron.)
Baker & Co., F. A.—1080 Bedford Ave., Brooklyn, N. Y. (Indian.)
Baker & Co., F. A.—37 Warren St., New York City. (Indian.)
Baker, C. R.—10 W. Main St., Salem, O. (Ford, Queen, Marsh motorcycles.)
Baker & Co., M. M.—Peoria, Ill. (Glide, Maxwell.)
Baker, F. H.—Dowagiac, Mich. (Haynes.)

Baker Motor Vehicle Co.—1791 Broadway, New York City. (Baker.)
Bakersfield Garage.—19th and G Sts., Bakersfield, Cal. (Royal.)
Baldner Motor Vehicle Co.—Xenia, O. (Mitchell.)
Baldwin, Bros. Co.—Rochester, Pa. (Pope-Hartford.)
Baldwin, L. F. M.—Providence, R. I. (Stanley.)
Bales, Frank.—Kansas City, Mo. (Cadillac.)
Ball, H. H.—93 Broadway, Paterson, N. J. (Orient Buckboard.)
Ball, J. V.—Loyalton, Cal. (Waltham.)
Ballou & Wright.—86 6th St., Portland, Ore. (Indian.)
Baltimore Motor Carriage Co.—305 N. Howard St., Baltimore, Md. (Winton.)
Banfil, W. H.—78 Portland St., Boston, Mass. (Jewel.)
Bangor Auto Garage & Motor Co.—2nd and Market Sts., Bangor, Pa. (Rambler.)
Banker Bros. Co.—Baum and Beatty Sts., Pittsburg, Pa. (Pierce Arrow, Autocar, Cadillac, Stevens-Duryea.)
Banker, C. A.—36 St. and Grand Blvd., Chicago, Ill. (Logan.)
Banta, A. J.—1354 Michigan Ave., Chicago, Ill. (Locomobile.)
Barbour, Plumb & Co.—2119 3d Ave., Birmingham, Ala. (Mitchell.)
Barclay Automobile Co.—246 3d Ave., Minneapolis, Minn. (Autocar, Thomas Flyer, Stanley.)
Barco, Geo. L. W.—Palm Beach, Fla. (Rambler); repairing.
Barden Electric & Mach. Co.—109 Main St. Houston, Tex. (Rambler, Reo, Mitchell, Frayer-Miller.)
Barger, W. H.—32 Edward St., Buffalo, N. Y. (Waltham.)
Barger, W. H.—226 S. Lafayette St., South Bend, Ind. (Cadillac, Waltham.)
Barker & Hitch.—Girard, Kan. (Northern.)
Barker, E. L.—Tiverton, R. I. (Maxwell.)
Barlow Hdwe. Co.—Corry, Pa. (Winton.)
Barnes Bros.—Blue Earth, Minn. (Buick.)
Barnes, E. K.—Rockford, Illinois. (Pope Waverly.)
Barnes, Hector.—Fargo, N. Dak. (Buick.)
Barnicle, Robt.—528 North Vandeventer Ave., St. Louis, Mo. (Waltham.)
Barnett & Levy.—1049 3d St., Louisville, Ky. (Haynes.)
Barnett, Jackson & Co.—236 W. 54th St., New York City. (Dorris.)
Barnstable Motor Car Co.—West Barnstable, Mass. (Atlas.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Barrett, W. G.—Katonah, N. Y. (Maxwell.)

Barringer Co., Ormond L.—20 W. Trade St., Charlotte, No. Carolina. (Franklin, Autocar, Cadillac, Baker, Pope Waverley, White.)

Barron & Co., A. K.—Gardner, Mass. (Northern.)

Barry Co., J. M.—343 Tremont St., Boston, Mass. (Second Hand cars.)

Barlett & Frasier.—106 N. Jefferson St., Huntington, Ind. (Buick.)

Bartlett, Geo. A.—Willimantic, Conn. (Columbia.)

Bartlett, O. L.—Mound City, Ill (Northern.)

Barton & Day.—So. Union St., Cambridge, N. Y. (Cameron.)

Barton, Geo. E.—409 1st Ave., Spokane, Wash. (Monarch, Reo.)

Barwise, R. M.—170th St. and Jerome Ave., New York City. (Chalfant.)

Bassford, B. E.—Tonopah, Nev. (Maxwell.)

Bass, Theo.—Farmington, Ill. (Reo, Premier.)

Bates, Geo. A.—Englewood, N. J. (Cadillac.)

Bates-Odenbrett Auto Co.—503 Broadway, Milwaukee, Wis. (Buick, Winton.)

Bates-Tannahill Co.—Greenville, S. C. (Buick, Cadillac, Franklin, Oldsmobile.)

Bath Automobile & Gas Engine Co.—Corner Broad and Commercial Sts., Bath, Me., (Winton, Franklin, Cadillac); garage; repairs; supplies.

Baughner, J. L.—Staunton, Va. (Rambler); garage; repairing.

Bawden, John H., Jr.—Freehold, N. J. (Rambler.)

Baxter, T. S.—317 Hastings St., Vancouver, Canada. (Haynes.)

Bay City Auto Co.—1016 Saginaw St., Bay City, Mich. (Cadillac.)

Bayliss, Jos. E.—1218 Michigan Ave., Chicago, Ill. (Elmore.)

Bay State Auto Co.—112 Norway St., Boston, Mass. (Queen, Bay State.)

Bazille Auto Co.—15 E. 9th St., St. Paul, Minn. (Autocar, Baker, Buick, Stevens-Duryea.)

Beacham & Son — — Fleet St., Portsmouth, N. H. (Stevens-Duryea.)

Beck, L. J.—Market Sts., I. Y. (Cadillac.)

Beck, M. J.—Sabinsville, Pa. (Buick.)

Beck, M. J.—Paw Paw, Ill. (Maxwell.)

Becker, A. B.—Lebanon, Pa. (Pope-Toledo.)

Beckman, Frank.—Lampassas, Texas. (Maxwell.)

Beck, J. P.—196 James Ave., Saginaw, Mich. (Maxwell, Rambler, Ford.)

Beck Livery & Auto Garage.—719 N. Illinois St., Indianapolis, Indiana. (Pope Toledo.)

Beck, M. J.—New Haven, Conn. (Lambert.)

Becroft, L. H.—Ogden, Utah. (Reo.)

Beebe, O. N.—Essex, Conn. (Cadillac, Winton, Locomobile.)

Beecher, J. S.—21 E. Church St., Newark, O. (Cadillac.)

Beelby Supply Co.—39 Fountain St., Grand Rapids, Mich. (Model.)

Beelman, Chas. S.—400 W. State St., Fremont, O. (Oldsmobile.)

Behrens & Bushwell.—Ivorytown, Conn. (Cadillac, Winton, Stevens-Duryea.)

Bell, A. W.—Stamford, Conn. (Jackson.)

Bell, Chas. L.—824 Oak St., Columbus, O. (Waltham.)

Bell, John W.—12th St. and Pacific Ave., Tacoma, Wash. (Columbia.)

Bellefield Motor Co.—4518 Henry St., Pittsburg, Pa. (De Luxe, Pennsylvania, Queen.)

Bellevue Automobile Station.—Hammononton, N. J. (Cadillac.)

Bellevue-Stratford Garage.—Philadelphia, Pa. (Colt Runabout.)

Benedict, J. H.—No. Lewisberg, Ohio. (Waltham.)

Benefield Bros.—Columbus, Ind. (Queen.)

Bennett & Wood.—Sydney, Australia. (Monarch.)

Bennett, A. C.—24 No. 8th St., Minneapolis, Minn. (Winton.)

Bennett, E., Jr.—1203 S. Main St., Los Angeles, Cal. (Wayne, Crawford.)

Bennett, C. S.—Clarion, Iowa. (Holman.)

Bennett, E. J. Auto Co.—Gauyama, Porto Rico. (Wayne.)

Benson, B. F.—1311 Keystone Bldg., Pittsburg, Pa. (Rainier, American Mercedes.)

Bentel, Geo. R.—607 Laughlin Bldg., Los Angeles, Cal. (American Mercedes.)

Benth, John P.—111 No. William St., Moberly, Mo. (Cadillac.)

Benz, W. G.—246-50 3d Ave., Minneapolis, Minn. (Rapid, Gale, Moline, Jackson.)

Bergdoll Motor Car Co.—323 N. Broad St., Philadelphia, Pa. (Welch.)

Berger Automobile Co.—2025 Farnum St., Omaha, Neb. (Wayne, Auburn.)

Bergstrom, C. H.—Neenah, Wis. (Rambler, Ford.)

Berkeley Auto Co.—Berkeley, Cal. (American.)

Berks Auto & Garage Co.—Cherry above 5th St., Reading, Pa. (Jackson, Maxwell.)

Berlin Auto Garage.—Berlin, N. H. (Cameron.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Berry Foundry Co.—St. Joseph, Mo. (Reo.)
Berwin Automobile Co.—128 N. 8th St., Allentown, Pa. (Elmore, Locomobile, Oldsmobile.)
Bettes, O. H.—590 San Jacinto St., Dallas, Tex. (Mitchell.)
Biayas, B. H.—Cumberland, Maryland. (Maxwell.) Garage.
Biddle, W. A.—Richmond, O. (Maxwell.)
Biever, L. N.—56 Elizabeth St., Derby, Conn. (Maxwell.)
Big 4 Auto Co.—110 E. 9th St., Los Angeles, Cal. (Marmon, Monarch, Model.)
Billings, Frank.—Worcester, Mass. (Knox.)
Billington Motor Car Co.—605-9 W. 7th St., Los Angeles, Cal. (Knox.)
Bill, John T.—10th and Main Sts., Los Angeles, Cal. (Stoddard-Dayton.) Supplies.
Bilz, Chas.—1432 Court Place, Denver, Colo. (Packard, Franklin, Buick.)
Binghamton Motor Car Co.—172 State St., Binghamton, N. Y. (Pierce Arrow, Pope-Toledo, Pope-Hartford, Buick, Columbus, Knox); garage.
Binns, Andy.—207 Grand Ave., Oklahoma City, Okla. (Pope Toledo.)
Birdsong & Potchernick.—San Antonio, Tex. (Maxwell.)
Bird, Sykes Co.—1470 Michigan Ave., Chicago, Ill. (Corbin.)
Birmingham Garage.—121 So. 20th St., Birmingham, Ala. (Maxwell, Stoddard-Dayton.)
Bishop, McCormick & Bishop.—Halsey St., nr Bedford Ave., Brooklyn, New York. (Dragon, Ford.)
Bishop, W. H.—Athens, Georgia. (Logan, Maxwell.)
Bissett, F. H.—529 S. 2d St., Minneapolis, Minn. (Indian.)
Bjornley, Eliot.—Kalispell, Mont. (Waltham.)
Black Auto Co., Sid.—630 Walnut St., Cincinnati, Ohio. (Buick, Franklin, Lozier); garage; repairing; renting; supplies.
Black, S. C.—222 No. Church St., West Chester, Pa. (Rambler.)
Blair, C. M.—Billings, Mont. (White.)
Blaisdell Bros.—Rockford, Illinois. (Cadillac.)
Blaisdell Mch. Wks.—6th St. and C. R. R. of N. J., Vineland, N. J. (Pope-Toledo.)
Blaisdell, Walter F.—58 Palmetto St., Brooklyn, N. Y. (Walter.)
Blair, Wiley.—Wichita Falls, Texas. (Buick, Waltham.)
Blake Co., E. P.—21 Hawkins St., Boston, Mass. (Jackson, Logan.)

Blake, G. W.—Colorado Springs, Colo. (Merkel.)
Blake, K. M.—400 Newbury St., Boston, Mass. (Locomobile.)
Blanchard, E. H.—Waterbury, Conn. (Pope-Hartford.)
Blenner, B. A.—1602 W. Broad St., Richmond, Va. (Pierce-Arrow, White, Winton, Dragon.)
Blessing, J. W.—Risingsun, Ohio. (Cartercar.)
Blewett, B. W.—Denton, Tex. (Waltham.)
Block Bros.—9 Water St., Mobile, Ala. (Rambler.)
Blodgett, V. E., & Co.—Santa Ana, Cal. (Holsman.)
Blomberg & Co., Frank C.—34 Madison St., Memphis, Tenn. (Buick, White, Baker.)
Blomstrom Motor Co.—Detroit, Michigan. (Queen.)
Bloom, A. J.—Hamburg, N. J. (Waltham.)
Bloomsburg Auto Co.—East & 3rd Sts., Bloomsburg, Pa. (Franklin.)
Blue Grass Auto Co.—Lexington, Ky. (Stoddard-Dayton.)
Blue Ribbon Garage.—291 Fairfield Ave., Bridgeport, Conn. (Columbia, Winton, Cadillac, Franklin, Lozier); garage; repairing; supplies.
Boda & Co., Robert F.—22 E. Rich St., Columbus, O. (National, Mitchell); garage; repairing.
Bohnet, Geo. J.—114 S. Franklin St., Saginaw, Mich. (Reo.)
Boland & Bros., F. E.—Grand and Oliver Sts., Rahway, N. J. (National.)
Boland Motor Co., F. E.—239 Halsey St., Newark, N. J. (National.)
Bolton Automobile Co.—Mt. Royal Ave. and Dolphin St., Baltimore, Md. (Ford, Reo, Premier); garage; repairing.
Bond Bros. Co.—Motor Mart, Boston, Mass. (Iroquois, Deere.)
Bond, R. B.—Jessups, Md. (Cadillac.)
Bonney Motor Car Co.—1112 Locust St., Kansas City, Mo. (Jewel, Wayne.)
Borderwisch & Glancy Auto Co.—12 N. Jeff St., Dayton, O. (Ford, Queen.)
Boston Automobile Exchange.—177 Berkeley St., Boston, Mass. (Jackson, Monarch, Logan.)
Boston Motor Co.—91 Church St., Boston, Mass. (Acme, Pungs, Fin.)
Boswell & Co.—25 N. Frank Wilkes-Barre, Pa. (Jackson.)
Botterill, Tom.—1643 California Denver, Colo. (Pierce Arrow.)
Botterill, Tom.—62 W. 3d St., South Lake City, Utah. (Babcock, Pi Arrow.)
Boulevard Garage Co.—Superior Boulevard, Cleveland, O. (Queen.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Bousfield, C. J.—Bay City, Michigan. (Packard.)
Bowe & Son, A.—231 W. Main St., Meriden, Conn. (Reo, Premier.)
Bower Auto Co.—2120 N. Nevada Ave., Colorado Springs, Colo. (Cadillac.)
Bowman & Barrett Auto Co.—Minneapolis, Minn. (Monarch.)
Boyman Automobile Co., Sidney B.—225-231 W. 49th St., New York City. (Apperson, Clement-Bayard); garage, repairing.
Bown, C. E.—309 W. Federal St., Youngstown, O. (Ford.)
Boyd Automobile Co.—415 Mass. Ave., Indianapolis, Ind. (Buick, Waltham, Stevens-Duryea.)
Boyer Motor Car Co.—468 Golden Gate Ave., San Francisco, Cal. (Royal, Franklin.)
Boyles, Geo.—425 E. Main St., Kalamazoo, Mich. (Ford.)
Braasct, Wm.—Sheboygan, Wis. (Waltham.)
Bradford Co.—711 Market St., Wilmington, Del. (Reo.)
Bradley, S. L.—809 N. Main St., Princeton, Ill. (Knox, Oldsmobile); garage; repairing.
Bradley Co., David.—Fond du Lac, Wis. (Rambler.)
Brady Auto Co., J. H.—234 Jefferson Ave., Detroit, Mich. (Peerless, Pope-Hartford.)
Braley, A. H.—400 South Spring St., Los Angeles, Cal. (Stearns.)
Braley, E. B. R.—Pasadena, Cal. (Maxwell, Pope-Waverley.)
Branch, H. P.—St. Cloud, Minn. (Buick.)
Brandagee Automobile Co.—625 State St., Bridgeport, Conn. (Stevens-Duryea.)
Brandenburg & Co.—103 Reade St., New York City, and 85 Lake St., Chicago, Ill. (Thor motorcycle.)
Branstetter Motor Co.—1337 Michigan Ave., Chicago, Ill. (Dragon, Ford.)
Braschi, H. J.—Mexico City, Mexico. (Rainier.)
Bravo, Oscar F.—Mayaguez, Porto Rico. (Oldsmobile.)
Brazier Auto Works.—38th and Market St., Philadelphia, Pa. (Marmon); repairing; garage.
ster & Co.—47th St. and Broadway, New York City. (Renault.)
ster, J. B., & Co.—7th Ave. and 49th New York City. (Acme.)
port Automobile Co.—388 Fair-
 1 Ave., Bridgeport, Connecticut.
 pe-Hartford, Pope-Toledo, Baker.)
port Cycle Co.—Bridgeport, Con-
 necticut. (Indian.)

Briggs, E. C.—127 East Jefferson St., South Bend, Indiana. (Franklin.)
Bristol Automobile Co.—Naugatuck Rd., Waterbury, Conn. (Thomas Flyer, Thomas Detroit); garage; repairing.
Bristol Motor Car Co.—North Main St., Attleboro, Mass. (Rambler, Cameron.) on.)
British & French Motor Car Co.—Mutual St., Toronto, Canada. (Daimler, Panhard, Argyll, De Dion, Minerva, Swift.)
British Columbia Auto Co.—924 Granville St., Vancouver, British Columbia. (Buick, Pierce, Racine, Ford, Jewel, Russell, Humber, Rover.)
Britton, R. D. & C. O., Co.—115 Allyn St., Hartford, Conn. (Maxwell); repairing.
Britz, J. N.—148 La Salle St., Aurora, Ill. (Model.)
Broad-Oak Garage.—621-7 E. Broad St., Columbus, O. (Rambler.)
Broadway Automobile Co., Inc.—Madison St. and Broadway, Seattle, Wash. (Pierce Arrow, Autocar, Knox, Cadillac, Baker, Packard, Peerless.) Repairing.
Brockton Auto Exchange.—51 Ward St., Brockton, Mass. (Jackson, Rapid.)
Brodie Electric Co.—42 Pleasant St., Manchester, N. H. (Pope-Waverley.)
Bronson, C. J.—42 Kent St., Grand Rapids, Michigan. (Cadillac, Winton.)
Brooklyn Auto & Garage Co.—Brooklyn, Iowa. (Reo, Moline.)
Brooklyn Motor Car Co.—1386 Bedford Ave., Brooklyn, N. Y. (Oldsmobile.)
Brooks, Leslie E.—Pensacola, Fla. (Pope-Hartford.)
Brouse, W. B.—Massena, N. Y. (Rapid.)
Brower, C. E.—Woodford, Maine. (Haynes.)
Brown A. B.—Gloversville, New York. (Waltham.)
Brown & Beck.—1737 Champa St., Denver, Colo. (American, M. & M., motorcycles.)
Brown & Pinney.—Stafford Springs, Conn. (Maxwell.)
Brown & Schmidt.—100 Lee Pl., Paterson, N. J. (Rambler, Maxwell.)
Brown & Scott Co.—Wellsville, N. Y. (Ford, Maxwell.)
Brown & Wright.—St. Johnsbury, Vt. (Maxwell.)
Brown, Bert.—Malone, N. Y. (Maxwell.)
Brown, B. L.—1126 S. Main St., Los Angeles, Cal. (Pope-Waverley.)
Brown Buggy Co.—Waterloo, Iowa. (Jackson.)
Brown, Chas. A.—Woodfield, Ohio. (Jewel.)
Brown, E. T.—Montgomery Center, Vt. ((Waltham.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Browne-Friend Motor Car Co.—228 Wisconsin St., Milwaukee, Wis. (Mitchell.)

Brown, Geo. De Witt.—Howe Ave. and Prospect St., Passaic, N. J. (Cadillac, Maxwell.)

Brown, H. A.—Oneonta, New York. (Waltham, Haynes.)

Brown, H. H.—Southbury, Conn. (Waltham, Cadillac.)

Brown, H. R.—Greenville, Tenn. (Haynes.)

Brown, J. Addison.—Champaign, Ill. (Peerless.)

Brown, J. F.—Cynthania, Ky. (Waltham.)

Brown, J. L.—Bisbee, Ariz. (Reo.)

Brown Motor Co., H. Oscar.—229 N. Broad St., Philadelphia, Pa. (Berliet.)

Brown, Paul A.—Des Moines, Iowa. (Waltham.)

Brown's Automobile Co.—177-9 Princess St., Winnipeg, Canada. (Rambler, Northern.)

Brown, Thompson & Co.—Main St., Hartford, Conn. (Packard, Cadillac, Stevens-Duryea.)

Brown, W. B.—Pittsburg, Pa. (Dragon.)

Brown, W. J.—Wellman, Iowa. (Glide.)

Brownell & Burt.—Wash. St., Taunton, Massachusetts. (Lambert.)

Browning Bros. Co.—Ogden, Utah. (Mitchell); repairing.

Bruce Motor Co., Inc.—100 Cass Ave., Joliet, Ill. (Buick, Knox, Haynes.)

Brugger & Smith.—Fond du Lac, Wisconsin. (Waltham.)

Brunell Auto Co.—38 Exchange St., Worcester, Mass. (Jackson.)

Brunmeyer, L. H.—12 S. La Salle St., Aurora, Ill. (Premier, Reo.)

Brunn's Carriage Manufactory.—1140 Main St., Buffalo, N. Y. (Stevens-Duryea.)

Brush, A. P.—Quinby, Va. (Cadillac.)

Bryson, T. A.—5-9 Perry St., E., Savannah, Ga. (Franklin, Cadillac, Columbia.)

Bubbs, Amos.—Glen Rock, Pa. (Maxwell.)

Buchanan, Wm.—Duluth, Minn. (Buick.)

Buch, Pedro.—2a Riviera de Santa Maria, No. 7, Mexico City, Mexico. (Mitchell.)

Buck Automobile Carriage & Implement Co.—Davenport, Ia. (Locomobile, Peerless, White, Franklin, Royal, Logan, Haynes.)

Buck Bros.—708 Garfield St., Bay City, Mich. (Queen.)

Buckeye Automobile Co.—441 Bank St., Cincinnati, O. (Monarch, Cameron.)

Buckeye Garage.—S. 8th St., nr. Main, Zanesville, O. (Reo, Ford.)

Buckeye Motor Co.—Columbus, Ohio. (Rambler.)

Buckman & Law.—442 State St., New Haven, Conn. (Rambler.)

Bucyrus Cycle & Automobile Co.—Bucyrus, O. (Maxwell, Mitchell, Rambler, Pope-Waverley.)

Buffalo Auto Exchange.—401 Franklin St., Buffalo, N. Y. (Franklin); garage; repairing.

Buffalo Motor Car Co.—437 Pearl St., Buffalo, N. Y. (Autocar, Hotchkiss, Cartercar.) Supplies.

Bugbee, B. D.—Putnam, Conn. (Pope-Hartford.)

Buick Automobile Co.—15th St., & Virginia Ave., Kansas City, Mo. (Buick.)

Buick-Waller Co.—Ottawa & Louis Sts., Grand Rapids, Mich. (Buick, Pope-Toledo.)

Buick Motor Co.—1412 Michigan Ave., Chicago, Ill. (Buick.)

Bulett, W. S.—Cor 53rd St. & Webster St., W. Philadelphia, Pa. (Sayers & Scoville Truck.)

Bulger, W. J.—Oswego, N. Y. (Jewel.)

Bulkley & Co., H. P.—South Norwalk, Conn. (Pope Waverley, Pope-Toledo, Pope Hartford.)

Bulkley Auto Sta.—Southport, Conn. (Corbin); repairing.

Bullock, J. G.—Los Angeles, Cal. (Merkel.)

Bunker, F. W.—North Anson, Maine. (Reo.)

Bunton, Frank L.—318-20 Main St., Canon City, Colo. (Maxwell, Rambler.)

Burdick, John.—485 River St., Troy, N. Y. (National.)

Burford, W. D.—227 Main St., La Crosse, Wis. (Lambert.)

Burgener, H. H.—Canton, O. (Jewel.)

Burlington Machine & Repair Co.—106 Church St., Burlington, Vt. (Stanley.)

Burnett, L. H.—E. Stroudsburg, Pa. (Holsman.)

Burnap & Roser.—Canajoharie, N. Y. (Atlas.)

Burney Bird Auto Co.—319 Wabash Ave., St. Paul, Minn. (Haynes.)

Burney Bird Automobile Co.—Minneapolis, Minn. (Mitchell, Maxwell.)

Burr, E. L. & A. M.—Rockford, Ill. (Waltham.)

Burrington Mot
Holyoke, M^t
Maxwell.)

Burt, H. B.—25 N. Phelp town, O. (Waltham.)

Burwell, A., Jr.—7 W. N. C. ((Rambler.)

Bush Bros.—Cor. Ohio Sidney, O. (Reo.)

Bush, Wm. E.—953 S. Angeles, Cal. (Pierce Arrow, Napier)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Butler Auto Co.**—Hamilton, Canada. (Pope-Toledo.)
Butler Motor Car Co.—Copley St.; garage Harcourt St., Boston, Mass. (Cleveland, Rapid, Pierce-Racine.)
Butler, T. J.—Harrison Ave. & 5th St., Harrison, N. J. (Cadillac.)
Butts, A. M.—246 Main St., Oneonta, N. Y. (Elmore.)
Butts, C. W.—Goddell, Ia. (Holsman.)
Butzer, John S.—Washington Avenue, Ephrata, Pa. (Maxwell, Reo, Rambler.)

C.

- Cadillac Automobile Company of Illinois.** 1312 Michigan Ave., Chicago, Ill. (Cadillac.)
Cadillac Automobile Co.—364 E. Market St., Indianapolis, Ind. (Cadillac.)
Cadillac Company of Dutchess County.—Red Hook, N. Y. (Cadillac.)
Cadillac Motor Car Co.—265 Jefferson Ave., Detroit, Mich. (Cadillac); garage and repairing.
Cahill Automobile Co.—1318 L St., N. W., Washington, D. C. (Waltham.)
Calgary Garage Co.—709 Centre St. Calgary, Alta, Canada. (Rapid, Reo, Oldsmobile, Pope-Waverley.)
California Automobile Co.—1224 Webster St., Oakland, Cal. (Maxwell, Mitchell.)
California Automobile Co.—318 East Market St., Stockton, Cal. (Mitchell.)
California & Nevada Auto Co.—1363 Bush St., San Francisco, Cal. (Stearns.)
Callahan, Atkinson & Co.—1020 Morton St., Baltimore, Md. (Locomobile, Pope-Toledo, Pope-Hartford.)
Callanan & Hogg.—Parkersburg, W. Va. (Cadillac.)
Calvert Zuzi Auto Co.—215 Clinton Ave., Newark, N. J. (Winton.)
Camden Auto Exchange.—58-60 N. 2nd St., Camden, N. J. (Dragon.)
Cameron Auto Co.—369 Commerce St., Dallas, Tex. (Buick, Franklin, Pope-Toledo.)
Cameron Motor Car Co.—923 S. Main St., Los Angeles, Cal. (Cameron.)
Cameron Motor Car Co.—303-305 N. 15th St., Philadelphia, Pa. (Cameron.)
Campbell & Co., C. G.—St. Albans, Vt. (Pope-Hartford.)
Campbell, A. R.—Morrisville, Vt. (Maxwell.)
Campbell Auto Co.—1st & Adams Sts., Marion, Ind. (Cadillac, Winton, Autocar.) Vulcanizing.
Campbell Auto Co.—Des Moines, Ia. Reo, Rambler, Mason); garage; repairing.)
Campbell Bros.—Danville, Ill. (Pope-Toledo.)
Campbell-Corwin Co.—902 Union St., Brooklyn, N. Y. (De Luxe.)
Campbell, England & Markscheffle.—Colorado Springs, Colo. (Peerless, Franklin, Oldsmobile, Columbus.)
Camp, L. W.—Akron, Ohio. (Haynes.)
Canada Cycle & Motor Co.—145 Bay St., Toronto, Canada. (Russell.)
Canada Standard Automobile, Ltd.—124 Bay St., Toronto, Ont., Canada. (Peerless.)
Canadian Automobile Co.—342 Craig St., W., Montreal, Canada. (Oldsmobile, Cadillac.)
Canadian Cycle & Motor Co., Ltd.—Ottawa, Can. (Russell.)
Canfield Auto Stations.—Canaan, Conn. (Knox, Stevens-Duryea, Waltham); garage; repairing.
Cantono Garage.—111 W. 37th St., New York City. (Cantono Electric); garage.
Capen Motor Car Co.—4739 McPherson Ave., St. Louis, Mo. (Locomobile.)
Capital City Auto, Hack & Livery Co.—176 Allyn St. Hartford, Conn. (Mitchell.)
Capital City Automobile Co.—167 Peachtree Ave., Atlanta, Ga. (Buick, Columbia, Cadillac, Franklin.)
Capital City Garage.—Perry St., Montgomery, Ala. (Buick, Waltham.)
Capital Garage.—1719 Capitol St., Cheyenne, Wyo. (Reo, Premier, Gale, Franklin, Buick, Mora, American.)
Capital City Motor Co.—904 Market St., Harrisburg, Pa. (Lambert.)
Capital Machine & Auto Co.—8th St., bet. I & J Sts., Sacramento, Cal. (Ford, Soules.)
Capitol Auto Co.—New York and Massachusetts Aves., Indianapolis, Ind. (Wayne, Reo, Overland.)
Capitol Auto Co.—313 Michigan Ave., Lansing, Mich. (Premier, Reo.)
Capitol Hill Auto Co.—Pine & Broadway, Seattle, Wash. (Mitchell, Rambler); garage; repairing.
Capitol Hill Garage Co.—615 "B" St., S. E., Washington, D. C. (Mitchell, Rambler. Second-hand cars.)
Caplin, G. W.—424 5th St., Minneapolis, Minn. (Royal Tourist.)
Capron, J. H.—Ord, Neb. (Cartercar.)
Carlisle Auto & Supply Co.—13 Main St., Carlisle, Pa. (Winton, Cadillac, Pope-Waverley.)
Carlow Auto Co.—51-59 Weir St., Taunton, Mass. (Winton, Buick); garage; repairing; supplies.
Carlson Auto Garage.—1060 Bedford Ave., Brooklyn, N. Y. (Winton.)
Carlton Garage & Repair Co.—St. Marks and Vanderbilt Ave., Brooklyn, N. Y. (Deere.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Carmichael-Bray Co., Inc.—370 Golden Gate Ave., San Francisco, Cal. (Elmore); garage; repairing.

Carolina Garage Co.—1216 Plain St., Columbia, S. C. (Rambler, Northern.)

Carpenter, Albert.—723 S. Liberty St., Muncie, Ind. (Pope-Waverley.)

Carrington Auto Co.—Carrington, N. Dak. (Dragon.)

Carson & Co., H. E.—Holyoke, Mass. (Knox.)

Carson, Frank C.—Iowa City, Ia. (Knox.)

Cartercar Auto Co.—San Francisco, Cal. (Cartercar.)

Cartercar Co.—249 3rd Ave., Minneapolis, Minn. (Cartercar.)

Cartercar Company.—7 W. 60th St., New York City. (Cartercar.)

Cartercar Co.—1519 Belmont Ave., Philadelphia, Pa. (Cartercar.)

Carter, C. C.—5th St., Redlands, Cal. (Cadillac.)

Carter, Foster.—520 Spring St., Shreveport, La. (Maxwell.)

Carthage Auto Garage.—Carthage, Mo. (Maxwell); garage; repairing.

Casa L'oma Garage Co.—Redlands, Cal. (Reo, Maxwell.)

Casco Automobile Co.—Portland, Me. (Peerless, Winton, Cadillac, Buick, Elmore, Packard.)

Case, George W.—54 Front St., Port Jervis, N. Y. (Rambler, Ford); garage; repairing.

Case, Harry.—Logansport, Ind. (Haynes.)

Case, S. W.—Montclair, N. J. (Holsman, Maxwell.)

Case-Long Machine Co.—Rushville, Ind. (Cadillac, Waltham.)

Cassell Bros.—Jacksonville, Ill. (Pope-Toledo.)

Castle H. C. & C. D.—893 Boylston St., Boston, Mass. (Lozier.)

Castle, H. C. & C. D.—19 Lyman St., Springfield, Mass. (Lozier.)

Caswell Auto Co.—Lowell, Mass. (Maxwell.)

Cathay Hardware & Improvement Company.—Cathay, N. Dak. (Waltham.)

Catlin, F. B.—Winsted, Conn. (Cadillac.) Second-hand cars; supplies.

Caulkins & Co., F. L.—405-415 Main St., Middletown, Conn. (Cadillac, Knox, Winton, Pope-Hartford); garage; repairing; supplies.

Cavin, J. H.—McComb, O. (Jewel.)

Cedar Rapids Auto Supply Co.—307 Third Ave., Cedar Rapids, Ia. (Ford, Maxwell, Jackson, White.)

Centaur Motor Co.—53-61 Franklin St., Buffalo, N. Y. (Peerless, Pope-Toledo, Winton, Oldsmobile, Cadillac, Darracq); garage; repairing.

Central Auto Co.—Jackson Bvd. and Franklin St., Chicago, Ill. (Second-hand cars.)

Central Auto Co.—839 Chapel St., New Haven, Conn. (Maxwell.)

Central Auto Co.—Lancaster, Pa. (Franklin.)

Central Auto Exchange.—71 Fountain St., Providence, R. I. (Monarch, National.)

Central Automobile Co.—170 Central Ave., Albany, N. Y. (Ford, Maxwell.)

Central Automobile Co.—2169 9th St., Cleveland, O. (Matheson, Studebaker.)

Central Automobile Co.—11 Crown St., New Haven, Conn. (Stoddard-Dayton, Maxwell.)

Central Automobile Co.—5989 Center Ave., Pittsburg, Pa. (Reo.)

Central Auto Station.—55 West St., Pittsfield, Mass. (Pierce Arrow, Franklin, Pope-Hartford, Stevens-Duryea); garage; repairing; supplies.

Central Auto Station.—236 Main St., New Britain, Conn. (Stevens-Duryea); garage; repairing.

Central Carriage Co.—134 Ontario St., Toledo, O. (Queen, Auburn, Maxwell, Mitchell.)

Central Garage.—Fulton St., Hempstead, N. Y. (Jackson, Austin.)

Central Garage.—12th & Madison, Oakland, Cal. (Cadillac.)

Central Motor Car Co.—150 S. Howard St., Akron, Ohio. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Maxwell.)

Central Motor Car Co.—Washington & Fairand Sts., Bloomfield, N. J. (Mitchell, Jackson); garage; repairing.

Central Penn. Auto Co.—111 Market St., Harrisburg, Pa. (Buick, Cadillac, Franklin, Pope-Toledo, Pope-Hartford, Pope-Waverley, White, Winton.)

Century Automobile Co.—450 Golden Gate Ave., San Francisco, Cal. (Kissel-Kar.)

Chabot, C. J.—337 Commerce St., Dallas, Tex. (Elmore.)

Chadwick & Co., G. R.—11 Post St., Portsmouth, N. H. (Lambert.)

Chadwick Engineering Works.—Philadelphia, Pa. (Chadwick.)

Chamberlain, C.—434 Front St., Ionia, Mich. (Ford, Maxwell.)

Chamberlin, R. R.—L... (Waltham.)

Chambers & Son, J. B.—304 N. Ve Ave., Danville, Ill. (Pope-Tole)

Chandler, A. N.—Marshfield. (Waltham.)

Champaign Automobile Co.—... paign, Ill. (Reo, Premier); gar repairs.

Champ Duval Co.—Canton, Ill. (B Rapid.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Chapman Treat P.—Brookfield, Mo. (Waltham.)
Chapin, A. A.—1st and M Sts., N. E., Washington, D. C. (Rapid.)
Charlonneau & Sons, E.—Ironwood, Wis. (Rambler.)
Charlestown Motor Co.—161 Meeting
Charleston Motor Co.—161 Meeting St., Charleston, S. C. (Reo, Premier);
Chase & Co., A. F.—418 3rd Ave., South Minneapolis, Minn. (Brush, Maxwell.)
Chase, Charles S.—Portland, Maine. (Buick.)
Chase, J. M.—Enfield, N. H. (Jackson.)
Chase, L. O.—193 Main St., Oshkosh, Wis. (Thomas); repairing.
Chase Motor Truck Co.—230 E. Water St., Syracuse, N. Y. (Ford, Chase, Stoddard-Dayton, Atlas.)
Chatfield, C. B.—1201 Center Ave., Bay City, Mich. (Haynes); garage; repairing.
Chattanooga Auto Co.—Southern Hotel Bldg., Chattanooga, Tenn. (Franklin, Cadillac.)
Chelsea Auto Storage Co.—516 W. 37th St. and 517 W. 36th St., New York City. (Manhattan); garage; repairing.
Chesapeake Launch & Motor Co.—Norfolk, Va. (Franklin.)
Chesapeake Motor Carriage Co.—North Ave., near Charles St., Baltimore, Md. (Pullman.)
Chesbro Ernest Co.—197 Pleasant St., Willimantic, Conn. (Buick, Cadillac, Waltham.)
Chesebrough, L. F.—2337 Telegraph Ave., Berkeley, Cal. (Cameron.)
Chester Automobile Co.—Broad and Crosby Sts., Chester, Pa. (Cadillac, Baker.)
Chester, John W. Co.—114 3rd Ave., Nashville, Tenn. (Lambert.)
Chestnut Hill Motor Car Co.—Chestnut Ave. and Bethlehem Pike, Chestnut Hill, Pa. (Clement-Bayard.)
Chicago Auto Garage Co.—3210 N. Clark St., Chicago, Ill. (Columbus, Premier, Reo.)
Chicago Motor Car Co.—1615 Michigan Ave., Chicago, Ill. (Packard.)
Chicago Vulcanizing Co.—Chicago, Ill. (Northern.)
Childs & Co. Ch.—12 Lafayette St., ackard, Franklin, e-Hartford, Auto-
 ne); garage.
Chalter H.—McKeesport, Pa.
 nson.)
Chalm-Philips Automobile Co.—5906
 lid Ave., Cleveland, O. (Stevens-
 yea); garage; repairing; supplies.
Chenson & Co.—Galveston, Tex.
 ord.)

Christ, G. B.—Niagara Falls, N. Y.—
 (Maxwell.)
Christ, Scott & Parshall.—Cooperstown,
 N. Y. (Deere, Cartercar); garage; re-
 pairing.
Churchill Hardware Co.—238 E. Main
 St., Galesburg, Ill. (Gale.)
Cia Pan-Americanade Vehiculos.—Mexi-
 co City, Mexico. (Buick, Packard.)
Cimiotti Garage Co.—Broadway & 110th
 St., New York City. (Mora.)
Cincinnati Auto Co.—215-219 E 5th St.,
 Cincinnati, O. (Pope-Toledo, Pope-
 Hartford, Peerless); garage; repairing;
 supplies.
Cincinnati Motor Vehicle Co.—117 Opera
 Pl., Cincinnati, O. (Pope-Waverly,
 Marmon); garage and repairing.
Citizens Motor Car Co.—N. E. Cor.
 Seventh & Main Sts., Cincinnati, O.
 (Packard, Pierce, Cadillac, Coulmbus
 Electric); garage; repairing.
City Hall Automobile Co.—66 Fulton
 St., San Francisco Cal. (De Luxe,
 Auburn, American Mors.)
City Motor Car Co.—1363 Bush St., San
 Francisco, Cal. (Stearns.)
Clanton, W. H.—Montgomery, Ala.
 (Jewel.)
Clapp, J. Reginald—379 S. Main St.,
 Geneva, N. Y. (Covert.)
Clarion Automobile Co.—Main St., Clar-
 ion, Pa. (Jackson.)
Clark, A. E.—Huron, S. Dak. (Hols-
 man); garage.
Clark Auto Co.—1201 Main St., Ander-
 son, Ind. (Maxwell, Mitchell.)
Clark Auto Car., E. R.—461 Worthing-
 ton St., Springfield, Mass. (Cadillac);
 garage.
Clark Automobile Co., E. R.—Whet-
 stone Bldg., Brattleboro. Vt. (Buick,
 Cadillac, Knox.)
Clark, B. B.—Livingston, Orange Coun-
 ty, Fla. (Waltham); garage; repair-
 ing.
Clark, C. D.—Torrington, Conn. Buick,
 Jackson.)
Clark, Chas. B.—North Yakima, Wash.
 (Waltham.)
Clark Geo. F.—660 Main St., Worcester,
 Mass. (Indian.)
Clark, James M.—134 Washington St.,
 Providence, R. I. (Mercedes.)
Clarke, W. S.—Cor. Broad and River
 Sts., Milford, Conn. (Ford, Lambert).
Clark's Auto Transit Co.—20 Ocean St.,
 Jacksonville, Fla. (Pope-Hartford.)
Clark, I. G.—616 San Antonio St., El
 Paso, Tex. (Holsman.)
Clark, I. M., Jr.—136 Bower St., Jersey
 City, N. J. (Waltham.)
Clark, J. A.—Eastern Ave., Herkimer,
 N. Y. (Maxwell.)
Clark, J. M.—Casino Terrace, Newport,
 R. I. (Dolson, Mercedes.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Clark, J. M.**—Yoakum, Tex. (Waltham.)
Clark, J. Y.—Leesburg, Fla. (Carter-car.)
Clark's Garage.—Boston Post Road, Stamford, Conn. (Winton); garage.
Clarkson & Oliver.—601-603 Mesquite St., Corpus Christi, Tex. (Northern, Ford, Rapid, Olds); garage; repairing.
Clayton, Geo. L.—Oakland, Cal. (Dorris.)
Clayton, W. C.—Key West, Florida. (Waltham.)
Cleveland Motor Car Co.—1659 Broadway, New York City. (Cleveland.)
Cleveland Motor Car Co.—1470 Michigan Ave., Chicago, Ill. (Cleveland); repairing.
Cline, J. W.—Brook, Ind. (Ford.)
Clinton Auto Co., H. D.—Binghamton, N. Y. (Matheson.)
Clinton, Louis R.—17 Carhart St., Binghamton, N. Y. (Thomas Flyer.)
Close Bros.—405 Smith St., Schenectady, N. Y. (Knox, Cadillac); garage; repairing; supplies.
Clough, C. R.—Columbus, O. (Buick.)
Clover Mfg. Co.—228 W. 58th St., New York City. (Second-hand cars.)
Club Garage.—729 S. Main St., Akron, O. (Lambert, Queen, Glide, Plymouth.)
Clute Bros.—49 Mohawk St., Cohoes, N. Y. (Pope-Hartford, Pope-Waverley, Royal Tourist); repairing.
Coatesville Garage.—3rd Ave. & Main St., Coatesville, Pa. (Pope-Waverley, Winton.)
Coburn & Beldon.—577 Central Ave., Newark, N. J. (Rainier.)
Coburn, Heath & Co.—1008 Boylston St., Boston, Mass. (Cameron.)
Cochrane, J. J.—Morse Jaw, Canada. (Waltham.)
Cochran, H. T.—Buena Vista, Colo. (Waltham.)
Coey & Co., C. A.—1424 Michigan Ave., Chicago, Ill. (Thomas Flyer); garage.
Coffin Bros.—515 Greene Ave., Brooklyn, N. Y. (Pierce-Racine.)
Coffin, E. C.—330 D. F. Walker Bldg., Salt Lake City, Utah. (Lambert.)
Coffing Bros.—Attica, Ind. (Pope-Hartford.)
Colburn Automobile Co.—15th St. & Colfax Ave., Denver, Colo. (Locomobile, Autocar, Rauch & Lang, White.)
Coldewey, W. G.—Cincinnati, O. (Frayer-Miller.)
Cole & Son.—Rockford, Ill. (Ford, Mitchell.)
Cole, Jos.—Patton, Pa. (Elmore.)
Cole, S. W. & Roebke, Wm.—Detroit, Mich. (Reo.)
Coleman, John G.—Red Wing, Minn. (Waltham.)
Collignon, Julio.—Guadalajara, Mexico. (Mitchell.)
Collinge, J. Walter.—Riverside, Cal. (Queen.)
Collins Bros.—Steubenville, O. (Mitchell.)
Collins & Co., D. P.—432 7th Ave., Pittsburgh, Pa. (Columbia.)
Colonial Auto Co.—3944 Olive St., St. Louis, Mo. (Reo, White.)
Colonial Automobile Co.—5518-20 Walnut St., Pittsburgh, Pa. (Aerocar, Cleveland, Pungs-Finch, Baker, Cartecar, Brazier.)
Colonial Garage.—220 W. 30th St., New York City. (Second-hand cars.)
Colorado Automobile Co.—1510 Court Place, Denver, Colo. (Cadillac.)
Colt Runabout Company of Pennsylvania.—Bellevue-Stratford Garage, Philadelphia, Pa. (Colt Runabout.)
Columbia Cyclery.—114 Circle, Palo Alto, Cal. (Winton.)
Columbia Garage, Inc.—327 Front St., Spokane, Wash. (Cadillac, Winton.)
Columbia Motor Vehicle Co.—74 Stanhope St., Boston, Mass. (Columbia.)
Columbus Buggy Co.—10th and Main Sts., Los Angeles, Cal. (Columbus.)
Columbus Buggy Co.—Minneapolis, Minn. (Columbus.)
Colver & Beale.—Kinsley, Kan. (Cadillac.)
Colvin, E. F.—Milton, Pa. (Cadillac.)
Commercial Auto & Supply Co.—1313 New York Ave., Washington, D. C. (Wayne.)
Commercial Auto Co.—1103 Grand Ave., Milwaukee, Wis. (Logan.)
Commercial Motor Car Co.—Times Bldg., 42d St. and Broadway, New York City. (Safir truck.)
Commercial Motor Car Co.—4390 Olive St., St. Louis, Mo. (Reliance.)
Commercial Truck Co. of N. E.—255 Atlantic Ave., Boston, Mass. (Commercial.)
Compania Mexicana de Vehiculos, Electricos.—Primera Humbolt 12, Mexico City, Mexico. (Locomobile, Mercedes, Pope-Toledo, Pope-Hartford, Cadillac, Atlas trucks, Clement-Bayard, Panhard, Columbia.)
Concord Motor Car Co.—64 Huntington Ave., Boston, Mass. (Waltham.)
Condon, Dr. C. M.—Carroll, Iowa. (Waltham.)
Connecticut Electric Equipment Co.—15 Church St., Meriden, Conn. (Corbin.)
Connecticut Motor Car Co.—Main St., Windsor Locks, Conn. (Columbus.)
Connecticut Steel & Wire Co.—308 Pearl St., Hartford, Conn. (Reo.)
Connerat, R. V.—18 E. State Street, Savannah, Ga. (Buick, Stevens, Baker, Autocar.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Connor, B. F.—South Main St., Wilkesbarre, Pa. (Indian.)
Conover Motor Car Co.—Patterson & Ellison Sts., Paterson, N. J. (Ford, Conover.)
Conrad Bros.—318-20 Linden St., Scranton, Pa. (Reo, Ford.)
Conrad, G. A.—819 Magnolia St., San Antonio, Tex. (Reo.)
Conroy, Phillips P.—39 Annandale Rd., Newport, R. I. (Columbus.)
Consolidated Wagon & Machine Co.—Salt Lake City, Utah. (Buick, Columbus, Knox, Northern.)
Continental Auto Co.—93 Jefferson Ave., Grand Rapids, Mich. (Dolson.)
Continental Auto Mfg. Co.—St. John & Olive Sts., New Haven, Conn. (American Mercedes, Continental, Columbus.)
Cook Auto Carriage & Imp. Co.—Orlando, Fla. (Buick, Cadillac.)
Cook & Co., R. A.—1253 Michigan Ave., Chicago, Ill. (Royal Tourist.)
Cook & Stoddard.—22nd & P Sts., N. W., Washington, D. C. (Franklin, White, Baker, Cadillac, Darracq.)
Cook, C. E.—New London, Ia. (Holsman.)
Cook, Fred W.—Niles, Mich. (Northern); repairing.
Cook, H. F.—117 Main St., San Antonio, Tex. (Ford, Reo.)
Cook Motor Car Co.—15th & Washington Sts., Portland, Ore. (Royal Tourist, Stevens-Duryea.)
Cook Motor Car Co.—Seattle, Wash. (Stevens-Duryea.)
Cool, B.—Salem, Kan. (Maxwell.)
Cooley, B.—Galena, Kan. (Northern, Maxwell.)
Cooney & Ames.—Tremont, Ill. (Glide.)
Coon, Wm.—13th St., Lincoln, Neb. (Maxwell, Reo.)
Cooper, Chas. S.—254 Clinton Ave. Newark, N. J. (Atlas.)
Coop, Leonard G.—Riverside, Cal. (Maxwell.)
Cooper, N. R.—445 Golden Gate Ave., San Francisco, Cal. (Colt.)
Copeland & Taylor.—221 W. Washington St., Pontiac, Ill. (Jackson, Northern); garage.
Copelin, J. E.—223 W. 8th St., Los Angeles, Cal. (Holsman.)
Corbaley & Thorpe Auto Co.—443-449 Emerson St., Palo Alto, Cal. (Autocar, Columbia, Sunset, Maxwell); garage; repairing.
Corbin Motor Vehicle Corp.—Elm & Chestnut Sts., New Britain, Conn. (Corbin.)
Corbin Motor Vehicle Corp.—1888 Broadway, New York City. (Corbin.)

Core, G. W.—High St., Columbus Grove, Ohio. (Mitchell); garage; repairing.
Corn Belt Auto Co.—Waterloo, Iowa. (Reo.)
Cordz, Henry.—Austin, Tex. (Pungs-Finch.)
Corkran, H. W.—12 S. Maryland Ave., Atlantic City, N. J. (Columbus, Autocar.)
Cornell, W. W.—West New Brighton, Staten Island, N. Y. (Maxwell.)
Corning Auto Co.—45 W. Market St., Corning, N. Y. (Franklin, Cadillac.)
Cornish-Friedberg Motor Car Co.—1233 Michigan Ave., Chicago, Ill. (Gale, Cornish-Friedberg.)
Corson, Myron L.—Springfield, Mass. 110 Huntington Ave., Boston, Mass. (Mitchell.)
Cortland Automobile Co.—151 S. Main St., Cortland, N. Y. (Cadillac, Franklin.)
Cortland Specialty Co.—Cortland, N. Y. (Maxwell.)
Corzine, W. T.—Litchfield, Ill. (Waltham.)
Corell, Charles.—Bay City, Mich. (Mitchell.)
Cosby, W.—2602 S. Main St., Los Angeles, Cal. (Premier.)
Costa Motor Car Co., M. J.—Philadelphia, Pa. (Clement-Bayard.)
Cousins & Howland.—Hanford, Cal. (Mitchell.)
Covert Motor Vehicle Co.—Lockport, N. Y. (Covert.)
Covey & Wallace Motor Co.—16th and Alder Sts., Portland, Ore. (Pierce-Arrow, Cadillac, Locomobile, Knox, Peerless.)
Covey, York.—Staceyville, Iowa. (Holsman.)
Cowan, W. K.—830-34 Broadway, Los Angeles, Cal. (Rambler); garage; repairing.
Cowen, H.—Ft. Morgan, Colo. (Waltham.)
Cowls, D. H.—Glens Falls, N. Y. (Ford.)
Cox, James F.—508 State St., New Haven, Conn. (Indian.)
Cox, J. W.—Kensington, O. (Jewel.)
Cox, J. Wade.—1013-15 Main St., Houston, Tex. (Ford.)
Craig, F. S.—Long Beach, California. (Dolson.)
Craig Garage.—Toledo, O. (Jewel.)
Craig Garage Co.—1213 Madison Ave., Toledo, O. (Stoddard-Dayton.)
Cramer, J. A.—737 Main St., Buffalo, N. Y. (Stoddard-Dayton, Wayne, Mitchell.)
Crane Auto & Garage Co.—Providence, R. I. (Atlas); garage.
Crane, E. F. Holland Garage.—200 S. 3rd St., Easton, Pa. (York-Pullman.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Crane, J. E.—922-930 18th St., Denver, Colo. (Second-hand cars); garage; repairing.

Crawford Auto Agency.—Bucyrus, O. (Winton.)

Crawford Agency.—152 W. 56th St., New York City. (Crawford.)

Creasy, R. B.—Ballinger, Tex. (Ford.)

Crescent Automobile Co.—2565 Boulevard, Jersey City, N. J. (Cadillac, Pope-Hartford, Pope-Toledo); garage; repairing.

Crescent Auto & Machine Co.—Cor. E. 2nd & Marr Sts., Fond du Lac, Wis. (Cadillac, Buick, Pope-Hartford, White); garage; repairing.

Crescent City Auto Co.—217 S. Rampart Ave., New Orleans, La. (Cleveland, Thomas Flyer, Northern.)

Crescent Garage.—McAllister and Gough Sts., San Francisco, Cal. (Moline.)

Criterion Motor Company.—Des Moines, Ia. (Criterion.)

Crittendon, Geo. A.—Lynn, Mass. (Darracq.)

Crocker Cycle Co.—Falmouth, Mass. (Cadillac.)

Croffe, A. C.—Main St., Sellersville, Pa. (Rambler); garage; repairing.

Croft, W. H.—Peekskill, N. Y. (Maxwell.)

Crone-Graham Motor Car Co.—Portland, Ore. (Knox.)

Cronin Auto Co.—567 S. Clinton St., Syracuse, N. Y. (Dragon.)

Crosby & Co., S. L.—186 Exchange St., Bangor, Me. (Reo, Knox); repairing.

Crossett Mercantile Co.—Crossett, Ark. (Northern.)

Crouch, F. M.—St. Louis Hotel, Duluth, Minn. (Woods.)

Crown Automobile Co.—569 S. Clinton St., Syracuse, N. Y. (Premier, Iroquois, Reo.)

Crown Garage.—534 Washington St., Hudson, N. Y. (Franklin); garage.

Crown Motor Car Co.—23 Motor Mart, Boston, Mass. (Glide, Aurora.)

Crowthers, Robert C.—117 E. 7th St., Cincinnati, Ohio. (Elmore.)

Crum & Co., H. C.—958-60 N. High St., Columbus, O. (Rambler, Jackson.)

Cryder & Co.—583 Park Ave., New York City. (French Mors, Leon-Bollie, and Importers of all foreign cars); garage; repairing.

Cuddeback, E. R.—122-124 E. 4th St., Fremont, Neb. (Stoddard-Dayton, Reo, Ford, Mason, Premier); garage; repairing.

Cuddeback, F. L.—Pueblo, Colo. (Waltham.)

Culbertson Bros.—Sacramento St., Lodi, Cal. (Waltham.)

Culp, T. S.—625-631 Mahoning St., Canton, Ohio. (Gale, Wayne); garage; repairing.

Cumbe, E. R.—1541 Cleveland Place, Denver, Colo. (Rambler, Mitchell.)

Cunningham, J. C.—Le Grand, California. (White.)

Curt & Adams.—420 Spruce St., Scranton, Pa. (Maxwell.)

Curtin-Herbert Co.—Gloversville, N. Y. (Northern.)

Curtin Williams Auto Co.—122 Parsons Ave., Columbus, O. (Autocar, Peerless, Pope-Hartford, Pope-Toledo, Stevens-Duryea.)

Curtis Automobile Co.—Grand Ave., Milwaukee, Wis. (Ford.)

Curtis-Hawkins Motor Co.—Motor Mart, Boston, Mass. (Chadwick.)

Curtiss Auto Co.—70 Albany Ave., Brooklyn, N. Y. (Franklin; second-hand cars.)

Curtiss Mfg. Co., G. H.—Hammondsport, N. Y. (Frayer-Miller, Ford.)

Cushing's Auto & Cycle Repository.—San Jose, Cal. (Model.)

Cushman, A. T.—Caribou, Me. (Jewel.)

Cutler, Austin.—La Porte, Ind. (Haynes.)

Cutler, D. P.—Rockford, Ill. (Knox.)

Cuyler, Lee.—453 Golden Gate Ave., San Francisco, Cal. (Cadillac, Packard.)

Cycle & Auto Co.—Davenport, Iowa. (Sayers & Scovill Truck, Maxwell.)

D.

Dahl & Sons.—Aurora, Neb. (Reo.)

Daimler Mfg. Co.—1777 Broadway, New York. (American Mercedes.)

Dain, F. W.—Peekskill, N. Y. (Waltham.)

Dale, Chas. J.—Plattsburg, N. Y. (Northern.)

Dalley & Schill.—230 N. 22nd St., Philadelphia, Pa. (American.)

Dana, Howard.—Cobleskill, N. Y. (Dolson.)

Danbury Hardware Co.—249-51 Main St., Danbury, Conn. (Rambler); supplies.

Danielson, O. M.—Leland, Ill. (Auburn.)

Danielson, C. B.—Milwaukee, Wis. (Monarch.)

Dante, Cusi.—Michocan, Mex. (Wayne.)

Dalley & Barrows.—128 N. Broad St., Philadelphia, Pa. (Fiat.)

Dalsimer Auto Co.—1206 Market St., Philadelphia, Pa. (Haynes.)

Darling Automobile Co.—Main 8th St., Auburn, Me. (Maxwell, n.)

Darracq Motor Car Co.—189 Broadway, New York. (Darracq.)

Darracq Motor Car Co.—1502 Michigan Ave., Chicago, Ill. (Darracq.)

Darracq Motor Car Co.—171 Huntington Ave., Boston, Mass. (Darracq.)

Dauer Auto Co.—24 Richmond St., Providence, R. I. (Franklin.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Dawson, J. T.**—Owensboro, Ky. (Cadillac.)
- Davenport, Barber Fire Proof Garage.**—106½ Main St., North Adams, Mass. (Stanley, Pope-Hartford.)
- Davenport Cycle Co.**—Davenport, Iowa. (Maxwell.)
- Daves & McCune.**—991 Main St., Riverside, Cal. (Moline.)
- David, Wm. P.**—Bridgeport, Pa. (Maxwell.)
- Davis Automobile Co., Inc.**—7 Dorrance St., Providence, R. I. (Thomas Flyer, Winton, Peerless, Locomobile, Oldsmobile, Cadillac, Darracq); garage; repairing; supplies.
- Davis, Dr. H. A.**—Dickinson, N. Dak. (Buick.)
- Davis, Henry.**—Clarksdale, Miss. (Oldsmobile.)
- Davis, Newton H.**—La Rue, O. (Ford.)
- Davis, O. E.**—Front Ave., Winchester, Ind. (Marmon, Premier, Ford, Reo.)
- Davis, W. B.**—92 Ontario St., Cleveland, O. (Jewel.)
- Day, Dr. W. A.**—Sparta, Minn. (Waltham.)
- Daytona Auto Transit Co.**—Daytona, Fla. (Cadillac.)
- Dayton Automobile Co.**—117 W. 4th St., Dayton, O. (Jackson, Premier, Maxwell, Stoddard-Dayton.)
- Deal, R. B.**—Lacota, Mich. (Waltham.)
- Deal & Cook.**—Rushville, Ind. (Reo.)
- De Barres Automobile Co.**—1966-6 Broadway, New York City. (Delehay, Pilain.)
- De Berthe, Louis.**—Milford, Pa. (Northern, Buick, Cadillac.)
- De Cant.**—3 Lancing Block, Watertown, N. Y. (Northern.)
- Decker, W. N.**—Baltimore, Md. (Monarch.)
- De Dietrich Import Co.**—3 W. 44th St., New York City. (De Dietrich.)
- Deemster, W. R. Machinery Co.**—Kansas City, Mo. (Maxwell.)
- Deere Plow Co., John.**—Omaha, Neb. (Moline.)
- De Haven Bros.**—87 Center Ave., Chicago, Ill. (De Haven.)
- De Kalb Automobile & Garage Co.**—De Kalb, Ill. (Rambler, Ford.)
- De Vries, W. F.**—Norwich, Conn.

age.—Philadelphia, Pa.

Auto Storage & Repair Co.—West Sts., Wilmington, Del. (verley.)

Imp. Co.—Colton, S. Dak.

(Moline.)

Luxe Motor Sales Co.—216 E. 3rd Cincinnati, Ohio. (De Luxe.)

- Demarest & Co., A. T.**—335 5th Ave., New York City. (Panhard.)
- Demonbreun, B. R.**—113 Public Sq., Nashville, Tenn. (Autocar.)
- Dench, C. B.**—455 W. 11th St., Erie, Pa. (Corbin.)
- Denman, Chas. S.**—Des Moines Water Works, Des Moines, Ia. (Woods.)
- Dennison, Julien.**—New Haven, Conn. (Atlas.)
- Depot Carriage & Baggage Co.**—Kansas City, Mo. (Rambler.)
- Derby Auto Co.**—Seymour Ave., Derby, Conn. (Franklin, Haynes, Cadillac.)
- Deright Auto Co.**—1816 Farnam St., Omaha, Neb. (Stoddard-Dayton, Ford, Mason, Premier, Rapid.)
- De Rivas, F. M.**—Mutual Bldg., Mexico City, Mex. (National, Logan.)
- Desert Automobile Co.**—71 S. State St., Salt Lake City, Utah. (Haynes, Autocar.)
- Deshler, O. R.**—Bangor, Pa. (Pope-Hartford.)
- de Terry, R. C. A.**—Sta. Maria la Blanca, 3, Seville, Spain. (Oldsmobile.)
- Detroit Automobile Top Co.**—245 Jefferson Ave., Detroit, Mich. (Winton.)
- Detroit Motor Car & Supply Co.**—2230 Broadway, New York. (American, Woods.)
- Dewhurst Motor Car Co.**—136 W. Main St., Lexington, Ky. (Queen.)
- Diamond Motor Car Co.**—1160 S. Main St., Los Angeles, Cal. (Apperson, Northern, Waltham.)
- Dibert, Dr. C. C.**—Buffalo Falls, Pa. (Waltham.)
- Dickerson, E. N.**—Stovall, N. C. (Waltham.)
- Dickinson, J. B.**—New London, Conn. (Dolson, Logan.)
- Diebold Motor Car Co.**—5th & McKinley Sts., Canton, O. (Buick, Franklin, Thomas Flyer.)
- Dietrich, O. H.**—24 N. 10th St., Allentown, Pa. (Buick, Thomas, Franklin, Cadillac.)
- Disbrow Bros.**—Hillside & Hoffman Blvd., Jamaica, N. Y. (Rainier, Ford, White, Stearns); garage; repairing; supplies.
- Dittman, Christian.**—Main St. & Broadway, Amityville, N. Y. (Maxwell, Cadillac.)
- Doan, E. D.**—926 Janes Ave., Saginaw, Mich. (Reo, Cartercar.)
- Dodson, E.**—West Liberty, O. (Winton.)
- Dodge, M. M.**—Valparaiso, Ind. (Maxwell.)
- Dodge Motor Vehicle Co.**—223 Columbus Ave., Boston, Mass. (Pope-Toledo, Pope-Hartford Pope-Waverley.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Doherty, H. B.**—24 Wall St., Binghamton, N. Y. (Pierce Arrow, Cadillac, Franklin, Darracq, American Mercedes.)
- Dolson Automobile Co.**—406 McKay Bldg., Portland, Ore. (Dolson.)
- Dolson Automobile Co.**—25 W. 42nd St., New York City. (Dolson.)
- Dominion Auto Co.**—Bay & Temperance Sts., Toronto, Canada. (Packard, Thomas, Stevens-Duryea, Winton, Russell, Ford.)
- Dominion Auto Co.**—310 Donald St., Winnipeg, Canada. (Packard, Thomas, Stevens-Duryea, Winton, Russell, Ford.)
- Donahoo-Emmons & Co.**—1114 1st St., Fresno, Cal. (Indian.)
- Donahue, Geo. J.**—389 Warren Ave., Brockton, Mass. (Rambler, Pope-Waverley, National, Reo, White.)
- Donaldson Hardware Co.**—Beaver, Pa. (Winton.)
- Donley & Dugan.**—Morgantown, W. Va. (Cadillac.)
- Dooley, Smith & Co.**—San Juan, Porto Rico. (Reo.)
- Doran, H. W.**—Dover, N. H. (Rambler.)
- Dorland, W. G.**—Aurora, Neb. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Dorset Co., L. P.**—17th & U Sts., N. W., Washington, D. C. (Glide.)
- Dorris Co. of New Jersey.**—21 Clinton St., Newark, N. J. (Dorris.)
- Dorris Motor Car Co.**—729 S. Broad St., Philadelphia, Pa. (Dorris.)
- Dosson Carriage Co.**—909 Jefferson Ave., Toledo, Ohio. (Holsman.)
- Doty, Ed.**—Andalusia, Ala. (Waltham.)
- Dounda, J. W.**—Barnesville, O. (Mitchell.)
- Dover Garage Co.**—74 E. Blackwell St., Dover, N. J. (Rambler, Jackson, Rapid, Holsman.)
- Dowagiac Mfg. Co.**—Dowagiac, Mich. (Maxwell, Mitchell.)
- Dow & Whitman**—125 Golden Gate Ave., San Francisco, Cal. (Rambler); repairing.
- Dowling Garage.**—26 Forest Ave., Portland, Me. (Thomas Flyer, Royal Tourist); garage; repairing; supplies.
- Downey, H. L.**—Calgary, Alta, Canada. (Maxwell.)
- Downing Garage & Repair Co., Inc.**—E. Lancaster Ave., East Downingtown, Pa. (Waltham.)
- Doyleston Auto & Motor Cycle Repair Shop.**—18 Donaldson St., Doyleston, Pa. (Cadillac, Pierce Arrow); repairing.
- Dragon Agency**—North Ave. & Charles St., Baltimore, Md. (Dragon.)
- Dragon Auto Co.**—1337 Michigan Ave., Chicago, Ill. (Dragon.)
- Dragon Auto Garage of Hudson County.**—1318 Park Ave., Hoboken, N. J. (Dragon.)
- Dragon Automobile Co.**—117 Massachusetts Ave., Boston, Mass. (Dragon.)
- Dragon Automobile Agency.**—37 Weybosset St., Providence, R. I. (Dragon.)
- Dragon Automobile Co.**—524 Golden Gate Ave., San Francisco, Cal. (Dragon.)
- Dragon Motor Co.**—31st & Chestnut Sts., Philadelphia, Pa. (Dragon.)
- Dragon Car Co.**—620 Maryland Ave., Pittsburg, Pa. (Dragon.)
- Dragon Motor Car Co.**—130 E. 9th St., Los Angeles, Cal. (Dragon.)
- Drake & Sons, Harry R.**—Newark, N. J. (Reo.)
- Drake Auto Station**—Suffolk, Virginia. (Cadillac.)
- Drake, E. J.**—Norfolk, Va. (Elmore, Cadillac.)
- Drawsbaugh, W. N.**—39 Dickinson Ave., Carlisle, Pa. (Winton, Cadillac, Pope-Waverley.)
- Drieshmere, Jacob.**—Sandwich, Illinois. (National.)
- Driscoll, Martin A.**—Haverstraw, N. Y. (Smith.)
- Driscoll, Martin A.**—Washington St. & Broadway, Long Beach, N. J. (Smith.)
- Drumbor, Chas. E.**—6 W. 3rd St., South Bethlehem, Pa. (Ford.)
- Drumb, W. A.**—Grand Rapids, Mich. (Waltham.)
- Ducker, A. C.**—Sumter, S. C. (Holsman.)
- Ducommon, H. Emile.**—Cleghorn, Iowa. (Waltham.)
- Dudley, J. Bliss.**—Los Angeles, Cal. (Crawford.)
- Dudley, S. W.**—108 E. Broadway, Butte, Mont. (White.)
- Duenas, Jos. M.**—Havana, Cuba. (Winton.)
- Duerr & Co., C. A.**—77th St. & Broadway, New York City. (Royal); repairing.
- Duerr, J. J.**—122-24 Northwest St., Bellevue, Ohio. (Jackson); repairing.
- Duff & Gregg.**—Nebraska City, Neb. (Rapid.)
- Duffield, Maus & Co.**—347-349 Wabash Ave., Chicago, Ill. (Logan.)
- Dunbar & Mansir.**—302 High St., Holyoke, Mass. (Elmore.)
- Duluth Auto Co.**—Duluth, Minn. (White.)
- Dunham, G. J.**—182 C-1 ton, Mass. (Royal)
- Dunham, M. H.**—Shelby, Ind. (Toledo.)
- Dunlap Motor Car Co.**—(Mitchell.)
- Dunnette, M. L.**—Abingdon, Va. (tham.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Dupont Garage Co.—2020 M St., N. W., Washington, D. C. (Columbia, Rambler, Waltham, Cleveland.)
Duquesne Cycle Co.—Pittsburg, Pa. (Indian.)
Durin, A. E.—Cedar Rapids, Ia. (American.)
Duro Manufacturing Co.—935 S. Los Angeles St., Los Angeles, Cal. (Durocar.)
Dussault Auto Works.—63 Buffalo St., Lockport, N. Y. (Cadillac, Winton).
Duttman, C.—Amityville, L. I., N. Y. (Maxwell.)
Dutton Co., W. H.—24 Washington St., Morristown, N. J. (Oldsmobile, Royal.)
Dye, C. T.—Remington, Ind. (Glide.)
Dyer's Auto Depot.—Cor. Pine and Benet Sts., Manchester, Mass. (Pope line.)

E.

Earl & Carpenter.—Worth, N. C. (Maxwell.)
Eastern Automobile Co.—19 University St., Montreal, Canada. (Ford, Winton, Maxwell, Cartercar.)
Eastern Exchange.—Newark, N. J. (Gale.)
Eastern Motor Car Co.—Elm St. & Cumberland Ave., Portland, Me. (Rambler.)
East Liverpool Auto Co.—East Liverpool, Ohio. (Maxwell, Mitchell.)
Eastman, H. M.—521½ Main St., Melrose, Mass. (Cadillac, Buick.)
Easton Automobile Co.—41 Delaware St., Easton, Pa. (Franklin, Buick, Pope-Waverley.)
Easton Automobile Co.—326 N. Broad St., Philadelphia, Pa. (Lozier, Stevens-Duryea.)
Easton Auto Co.—Wilson, N. C. (Cadillac.)
East Side Auto Co.—Minneapolis, Minn. (Queen.)
East Side Automobile Sta.—Westminster St., Providence, R. I. (Pennsylvania.)
Eaton, C. A.—22 E. Concord St., Boston, Mass. (Lambert.)
Eaton, D. O.—236 N. Broad St., Philadelphia, Pa. (Rapid.)
Eau Claire Motor Car Co.—Chase Bldg., Eau Claire, Wis. (Pope-Toledo, Waltham.)
Eby Mfg. Co.—Lincoln, Neb. (Dragon.)
Echo Co.—Cor. Delaware & Young St., Tonawanda, N. Y. (Waltham.)
Ecker, J. D.—Keokuk, Ia. (Holsman.)
Eclipse Auto & Construction Co.—101-7 S. 6th St., Brooklyn, N. Y. (Smith.)
Eclipse Automobile Co.—955 S. High St., Columbus, O. (Haynes.)

Edaburn, H. W.—110 N. Elm St., Creston, Ia. (Buick, Cadillac.)
Edgewater Garage.—Evanston Ave. and Winona St., Chicago, Ill. (Buick.)
Edgewood Auto Co.—376 Smith St., Edgewood, R. I. (Northern.)
Edgeworth Machine Co.—Edgeworth, Pa. (Packard, Franklin, Waltham, Pope-Waverley.)
Edwards, A. G.—534 N. High St., Columbus, Ohio. (Indian.)
Edwards & Peck.—Rye, N. Y. (Pope-Hartford.)
Edwards Bros.—London, England. (Monarch.)
Edwards, L. K.—Masonic Block, Estabab, Mich. (Cadillac.)
Eichorn & Black.—9 Hill St., Newark, N. J. (Crawford.)
Eidam, Dr. C. H.—Lawrence, Mass. (Jackson.)
Elgin Hardware Co.—Elgin, Ill. (Cartercar.)
Eikenberry, A. L.—126 W. Fourth St., Greenville, Ohio. (Northern.)
Eldridge Beebe Auto Garage Co.—Marshalltown, Iowa. (Rambler.)
Electric Supply Co.—309 Bull St., Savannah, Ga. (Ford, Queen, Pope-Waverley.)
Electric Vehicle & Garage Co.—621 Grand Ave., Milwaukee, Wis. (Waltham.)
Electric Vehicle Co.—1332 Michigan Ave., Chicago, Ill. (Columbia.)
Electric Vehicle Co.—134 W. 39th St., New York City. (Columbia); garage; repairing.
Electrical Construction Co.—1126 S. Main St., Los Angeles, Cal. (Baker, Columbus, Dolson, Mora, Pope-Waverley.)
Electrical Construction Co.—Racine, Wis. (Mitchell.)
Electrical Construction & Supply Co.—537 S. Main St., Findlay, O. (Columbus.)
Elizabeth Motor & Cycle Co.—16 Julian Pl., Elizabeth, N. J. (Indian.)
Elizabeth Motor Car Co.—14 Westfield Ave., Elizabeth, N. J. (Rambler, Maxwell.)
Elkhart Garage Co.—Elkhart, Ind. (White, Maxwell, Mitchell.)
Ellerd Bros.—Plainview, Tex. (Acme.)
Elliot & Coleman.—339 Bush St., San Francisco, Cal. (American.)
Ellis, Fred.—Methuen St., Lawrence, Mass. (Pope-Hartford.)
Ellis Motor Car Co.—222 Halsey St., Newark, N. J. (Pierce Arrow.)
Ellsworth, F. V. P.—Hot Springs, Ark. (Waltham.)
Ellisville Auto Co.—Ellisville, Ill. (Waltham.)
Elmer Auto Co.—Hartford, Conn. (Ford, Rambler.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Elmore Auto Co.—1851 Broadway, New York. (Elmore.)
Elmore Motor Car Co.—1228 S. Figueroa St., Los Angeles, Cal. (Elmore.)
El Paso Foundry & Machine Co.—El Paso, Tex. (Cadillac.)
Elton Automobile Co.—156 E. Main St., Waterbury, Conn. (Reo, Rambler.)
Elvey, Frank O.—Douglas, Ariz. (Cadillac.)
Emmetsburg Auto & Gas Engine Co.—Emmetsburg, Ia. (Jackson.)
Empire Auto Co.—Greenwich, Conn. (Maxwell.)
Empire Garage.—97 North St., Middletown, N. Y. (Cadillac.)
Empire State Motor Car Co.—2148-50 Broadway, New York. (Queen); repairing; garage.
Endurance Motor Car Co.—737 7th Ave., New York, N. Y. (Rapid.)
Engel, Louis, Jr.—437 Pearl St., Buffalo, N. Y. (Cartercar.)
England, G. W.—2210 Brooklyn Ave., Kansas City, Mo. (Dolson.)
Englund, J. A.—Kenmare, N. D. (Buick.)
Ennis & Gavin.—14 Martin Ave., White Plains, N. Y. (Reo.)
Enos & Titterington.—Jerseyville, Ill. (Holsman.)
Enterprise Machine Works.—Cor. Park St. and Valley Ave., Spring Valley, Minn. (Reo.)
Eperson, F.—114 N. 11th St., La Crosse, Wis. ((Pope-Waverley.)
Erickson, Louis.—1520 Belmont Ave., Seattle, Wash. (Dragon.)
Erskine & Hall.—South Orange, N. J. (Rambler.)
Escalante e Hugo, E. Calle.—63 N. Merida, Yucatan, Mexico. (Ford, Maxwell.)
Escanaba Cycle Works.—Escanaba, Mich. (Rambler.)
Essex Auto Co.—518 Broad St., Newark, N. J. (Jackson.)
Essex Automobile Co.—Oxford Garage, 197 Broad St., Lynn, Mass. (Ford.)
Ettwein Motor Car Co.—37th & Main St., Kansas City, Mo. (Stoddard-Dayton, Welch.)
Euclid Garage.—10636 Euclid Ave., Cleveland, Ohio. (Pungs Finch.)
Euclid Garage Co.—Euclid Ave., Upland, Cal. (Gale, Jackson.)
Eureka Motor Car Co.—1409-11 Broadway, Seattle, Wash. (Dolson, American Mors.)
Evans, C. W.—Dipon, Ill. (Northern.)
Evans, F. T.—136 S. Pittsburg St., Connelville, Pa. (Rambler.)
Evans Motor Car Co.—621 1st Ave., Minneapolis, Minn. (Jewel, Wayne, Mitchell.)
Evansville Auto Co.—5th & Locust Sts., Evansville, Ind. (Simplicity.)

Everett Automobile Co.—148 N. Ionia St., Grand Rapids, Mich. (Gale.)
Everhart, H. C.—Taylorsville, N. C. (Maxwell.)
Eves, J.—Millville, Pa. (Cadillac.)
Excelsior Carriage Co.—White River Junction, Vt. (Cadillac, Buick, Stanley.)
Excelsior Poultry & Provision Co.—69 Franklin Ave., Pittsburg, Pa. (Waltham.)

F.

Faber & Co., Wm.—Oshkosh, Wis.—(Cartercar.)
Fair Oak Garage.—Pasadena, Cal. (Rambler.)
Fair Bros.—1908 Seventh Ave., Beaver Falls, Pa. (Jackson.)
Falcon Motor Works.—114 Wick Ave., Youngstown, Ohio. (Baker.)
Fall River Auto Co.—375 Durke St., Fall River, Mass. (Stanley.)
Fancher & Morris.—Salt Lake City, Utah. (Maxwell.)
Fancher, Sayer.—21 Cottage St., Middletown, N. Y. (Lambert.)
Farnsworth & Glidden.—25 Euclid St., Rochester, N. Y. (Welch.)
Farrington, B. W.—Perth Amboy, N. J. (Waltham.)
Faulkner & Bowers.—Troy, Ohio. (Reo.)
Fawcett, C. E.—119-121 3rd Ave., Cedar Rapids, Iowa. (National); garage; machine shop; supplies.
Fawkes Auto Co.—111 S. 6th St., Minneapolis, Minn. (Holsman, National, Rambler, Glide.)
Fawkes Auto Co.—202-06 W. 6th St., St. Paul, Minn. (Holsman, National, Rambler, Glide.)
Fay & Scott.—Dexter, Me. (Reo, Maxwell); garage; repairing.
Fay, C. A.—210 6th Ave., Clinton, Ia. (Reo.)
Fay, Owen H.—243 Michigan Boulevard, Chicago, Ill. (Elmore.)
Fayette Automobile Co., E.—76 E. Fayette St., Uniontown, Pa. (White, Peerless, Reo, Holsman); garage; repairing.
Featherstone, J. E.—Aurora, Mo. (Holsman.)
Fee-Bock Auto Co.—254 Jefferson Ave., Detroit, Mich. (Elmore.)
Fee-Vincent Electric Car—ferson Ave., Detroit, M
Fee & Stewart Co.—(Waltham.)
Felker Auto Co.—1535 .
 ver, Colo. (Stevens-Dur;
 tham, Pope-Waverley
 pairing.
Feldmeir, Harvey.—Litt
 (Franklin.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Fellwock Automobile & Mfg. Co.—320-322 Upper 4th St., Evansville, Ind. (Maxwell, Mitchell, Stoddard-Dayton, National, Baker, Ford); garage; repairing.

Feltham, Arthur J.—Providence, R. I. (Cadillac.)

Fenn Bros.—122-124 E. 16th St., Sioux Falls, S. D. (Packard, Autocar, Buick.)

Fenner, F. H.—The Ridotto, 1009 Washington St., Bay City, Mich. (Jackson, Mitchell, Franklin.)

Ferguson Implement Co.—2105 E. 15th St., Kansas City, Mo. (Haynes, Gale.)

Ferguson, B.—Orion, Ill. (Waltham.)

Fernald Auto Co.—1548 Broadway, Denver, Colo. (Maxwell, Auburn.)

Fernald, Geo. H.—North East, Pa. (Maxwell.)

Ferrel, A. M.—Everett, Wash. (Mason, Ford, National); garage.

Ferres, John G.—118 W. Main St., Johnstown, N. Y. (Reo); supplies.

Fiat Auto Co.—1789 Broadway, New York City. (Fiat.)

Fiat Lange e Cia.—Paseo de la Reforma, Mexico City, Mex. (Fiat.)

Fich, H. Chr.—Copenhagen, Denmark. (Wayne.)

Field Auto Co.—103 Pryor St., Atlanta, Ga. (Stoddard-Dayton.)

Field & Co.—Augusta, Ga. (Rambler, Pope-Waverley.)

Fifield Bros.—Augusta, Me. (Maxwell.)

Fifer, Chas.—Salem, Ohio. (Mitchell.)

Filiatrault, E. J.—Duluth, Minn. (Thomas Flyer.)

Findlater Hardware Co.—San Angelo, Tex. (Holsman.)

Fink, August D.—58 Palmetto St., Brooklyn, N. Y. (Haynes.)

Finks, H. P.—Fort Smith, Ark. (Holsman.)

Fishbeck, Fred.—Tonopah, Nev. (Chadwick.)

Fischer, J. G.—Saginaw, Mich. (Monarch.)

Fisher Auto Co.—330 Illinois Ave., Indianapolis, Ind. (National, Stoddard-Dayton, Mitchell, Maxwell); garage; repairing.

Fisher, F. J.—Vicksburg, Miss. (Reo.)

Fisher, J. L.—Maryville, Mo. (Wal-

1.—167 Pine St., Providence, (Buick.)

43 Wells St., Hartford, at, Panhard, Locomobile.)

Carroll Horse Co.—Motor cept., 153 E. 24th St., New York (Reliance, American.)

and, H. L. & Co.—9 Columbia St., a. N. Y. (Maxwell.)

Chas. R.—Southampton, Long Isd, N. Y. (Maxwell.)

Flatbush Automobile Co.—Brooklyn, N. Y. (Deere.)

Flatbush Motor Car Co.—Snyder & Bedford Ave., Brooklyn, N. Y. (Corbin, Columbus Electric); garage; repairing.

Fleming & Brown.—Station St., Kankakee, Ill. (Rambler.)

Flescher, Louis.—1622 Capitol Ave., Omaha, Neb. (Indian.)

Flint Motor Car Co.—212 Union St., Providence, R. I. (Packard.)

Flock & McBee.—Mobile, Ala. (Buick.)

Flock, H. J.—Sterling, Ill. (Rambler, Premier.)

Foley & De Weese.—East St. & Michigan Ave., Greenburg, Ind. (Jackson, Logan, Rambler.)

Foley & Smith.—Greensburg, Ind. (Jackson.)

Forbes, Allen H.—Amherst, Mass. (Waltham.)

Forbes, J. P.—Forbes Bldg., Coshocton, O. (Winton, Stoddard-Dayton.)

Ford Agency.—127 Franklin St., Norwich, Conn. (Ford.)

Ford Auto Co.—688 N. High St., Columbus, Ohio. (Ford.)

Ford, Geo.—Union St., Olean, N. Y. (Ford.)

Ford Auto Co.—Jefferson Ave., Detroit, Mich. (Ford.)

Ford, H. N.—Jamestown, N. Dak. (Dolson.)

Ford Motor Co.—1913 Euclid Ave., Cleveland, Ohio. (Ford.)

Ford Motor Co.—1444 Michigan Ave., Chicago, Ill. (Ford.)

Ford Motor Co.—445-51 N. Broad St., Philadelphia, Pa. (Ford.)

Ford Motor Co.—727 Main St., Buffalo, N. Y. (Ford.)

Ford Motor Co.—1721 Broadway, New York City. (Ford.)

Ford Motor Co.—147 Columbus Ave., Boston, Mass. (Ford.)

Ford Motor Co.—318 E. 11th St., Kansas City, Mo. (Ford.)

Ford, W. M.—1227 N. Washington Ave., Scranton, Pa. (Jackson.)

Forest & Malone.—10 Norcross Ave., Rochester, N. Y. (Merkel.)

Forry, Ed. S.—120 S. Meridian St., Portland, Ind. (Jewel.)

Fort Dodge Automobile Co.—Fort Dodge, Iowa. (Cadillac, Pope-Hartford.)

Fort Pitt Automobile Co.—Baum St. & Euclid Ave., Pittsburg, Pa. (Stearns, Locomobile, Oldsmobile); garage; repairing.

Fortin, Geo.—237 Court St., Kankakee, Ill. (Maxwell.)

Fort Wayne Motor Car Co.—Fort Wayne, Ind. (Cadillac.)

Fort Worth Auto Co.—208-216 W. 3rd St., Fort Worth, Tex. (Elmore, Haynes, Franklin.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Fosdick Co., Harry.**—53 Stanhope St., Boston, Mass. (Thomas Flyer, Atlas.)
- Foss-Hughes Motor Car Co.**—221 N. Broad St., Philadelphia, Pa. (Pierce Arrow, Cadillac, Knox, Baker); garage; repairing; recharging.
- Foss-Hughes Motor Car Co.**—Wilmington, Del. (Cadillac.)
- Foss-Hughes Motor Car Co.**—512 Industrial Trust Bldg., Providence, R. I. (Pierce Arrow, Knox.)
- Fostoria Auto Machine Co.**—McDougal and Poplar Sts., Fostoria, O. (Pope-Toledo.)
- Fostoria Garage & Motor Co.**—123 E. Tiffin St., Fostoria, O. (Franklin, Elmore, Pope-Hartford, Pope-Waverley.)
- Fouche, Ira.**—Ashland, O. (Cameron.)
- Fournier, A.**—New London, Conn. (Atlas.)
- Fourth Street Automobile Co.**—323 E. 4th St., Long Beach, Cal. (Maxwell.)
- Foust & Foust.**—Warren, Ind. (Holsman.)
- Fowler, C. W.**—Pueblo, Colo. (Reo.)
- Fowler Bros.**—Putnam Ave., Greenwich, Conn. (Ford.)
- Fox, Fred.**—Stronghurst, Ill. (Waltham.)
- Fox, W. A.**—249 3rd Ave., S., Minneapolis, Minn. (Cartercar.)
- Franco-American Auto Supply Co.**—Chicago, Ill. (Clement-Bayard.)
- Franklin Auto Co.**—Franklin, Neb. (Holsman.)
- Franklin Automobile Co.**—Broadway and 73rd St., New York City.
- Franklin Automobile Co.**—1450 Michigan Ave., Chicago, Ill. (Franklin.)
- Franklin Garage.**—1024 Sprague St., Spokane, Wash. (Franklin.)
- Franklin Garage.**—163 John St., Bridgeport, Conn. (Holsman, Crawford.)
- Franklin Motor Co.**—Franklin, Pa. (Pope-Toledo.)
- Franklin, Wm. H.**—Hightstown, N. J. (Dragon.)
- Fraser, H. A.**—1010 Broadway, Bay City, Mich. (Waltham.)
- Frayer-Miller Motor Car Co.**—62nd St. & Broadway, Motor Mart, New York City. (Frayer-Miller); repairing, Frayer-Miller cars only.
- Frazier & Frazier.**—South Bend, Ind. (Rambler.)
- Frazier & Reynolds.**—214 S. 23rd St., Philadelphia, Pa. (Wayne.)
- Frederick Co., W. A.**—Motor Mart, 16 Columbus Ave., Boston, Mass. (American.)
- Frederickson, H. E.**—2046-2048 Farnham St., Omaha, Neb. (Buick, Pierce-Arrow, Haynes, Woods.)
- Freed, A.**—1507 Market St., San Francisco, Cal. (Merkel, Gale, Model.)
- Freed & Bransford.**—Salt Lake City, Utah. (Wayne.)
- Freel & Trumpour.**—4th & Johnson St., Bay City, Mich. (Ford.)
- Freeman, E. J.**—Reno, Nev. (National.)
- Freeman, F. N.**—Gouverneur, N. Y. (Maxwell.)
- Freeman, F. P.**—Cor. Irving St. & Elizabeth Ave., Rahway, N. J. (Ford, Crawford.)
- Freese, A. D.**—Nellie, O. (Jewel.)
- Fremont Novelty Works.**—507 W. State St., Fremont, O. (Pope-Waverley.)
- Frenier & Son, J. H.**—Rutland, Vt. (Rambler, Ford.)
- French, C. J.**—Concord, Mich. (Waltham.)
- French Carriage Co.**—92 Summer St., Boston, Mass. (Clement-Bayard.)
- French, L. E.**—205 N. Broad St., Philadelphia, Pa. (Pullman.)
- French, O. J.**—Concord, N. H. (Waltham.)
- Freyer, Chas. H.**—Marietta, Ga. (Reo.)
- Friel, W. J.**—Portsmouth, Ohio. (Ford.)
- Fritts Hardware Co., T.**—Chattanooga, Tenn. (Waltham.)
- Fritz Bros.**—19 N. 6th St., Zanesville, O. (Winton, Cadillac.)
- Frost, F. E.**—505 Main St., Worcester, Mass. (Pierce Racine.)
- Fry, John E.**—1562 Broadway, Denver, Colo. (Apperson.)
- Fry, Thos. C.**—Rochester, Pa. (Haynes.)
- Fudge, L.**—Farmersville, Ohio. (Holsman.)
- Fuller, Alvan T.**—Motor Mart, Park Square, Boston, Mass. (Packard, Cadillac.)
- Fuller & Thornton.**—2028 Samson St., Philadelphia, Pa. (Simplex.)
- Fulper, William H.**—Fleming, N. J. (Dolson.)
- Fultcher, Joe T. (Gadsden Garage).**—Gadsden, Ala. (Cadillac); garage.
- Funk, Upton.**—Shippenburg, Pa. (Monarch.)
- Futer, B. Franklin.**—213 N. Duke St., Lancaster, Pa. (Maxwell, Acme); garage; repairing.

G.

- Gable, A. M.**—18 E. Independent St., Shamokin, Pa. (Stanley.)
- Gage Bros.**—Lakefield, Minn. (Monarch.)
- Gagemobile Co.**—Saratoga Springs, N. Y. (White.)
- Gailey Bros.**—Cardiff, Md. (Waltham.)
- Gaines & Whitesell.**—1207 Main St., Richmond, Va. (Stoddard-Dayton, Maxwell, Holsman, White, Pope-Waverley.)
- Gaither, Wm.**—28-30 N. Fountain Ave., Springfield, Ohio. (Franklin.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Gale Auto Co.—Prairie St., Galesburg, Ill. (Gale.)
Gale Garage.—1915 S. Hoover St., Los Angeles, Cal. (Gale.)
Galena Auto Garage.—Galena, Kan. (Pope-Toledo, Pope-Hartford, Northern, Reo.)
Gallaher, E. B.—228 W. 58th St., New York. (Brazilier, Napier, Pullman, Maja.)
Gallagher, J. C.—Rathburn House, Elmira, N. Y. (Haynes.)
Galloway & Co., W.—Gateshead, England. (Stanley.)
Galloway Co., Wm.—Waterloo, Iowa. (Cadillac.)
Galveston Motor Car Co.—Galveston, Tex. (Rapid.)
Garden City Garage.—Garden City, N. Y. (American Mercedes.)
Gardner, R. L.—Pulaski, Va. (Waltham.)
Gardner & Shearer.—6 Avenida Juarez, Mexico City, Mexico. (Franklin.)
Garfield Park Automobile Co.—1891 W. Harrison St., Chicago, Ill. (Lambert.)
Garford Motor Car Co., The.—1540-1542 Broadway, New York City. (Garford); repairing; garage.
Garland, R. F.—St. Paul, Minn. (Maxwell.)
Garlick Garage.—642 Madison Ave., Paterson, N. J. (Mason.)
Garlock & Co., O. J.—Palmyra, N. Y. (Peerless.)
Garrabrand, Arthur L.—Newark, N. J. (Haynes.)
Garretson Auto & Cycle Co.—132 Main St., Somerville, N. J. (Franklin, Oldsmobile.)
Garrity & Co., T. C.—Vesper, Kansas. (Waltham.)
Gartin, Burt & Adams.—Salida, Colo. (Franklin.)
Gaskins, R. L.—Suffolk, Va. (Maxwell.)
Gate City Motor Car Co.—815 Main St., Keokuk, Ia. (National, Rambler.)
Gate City Motor Car Co.—708 Empire Bldg., Atlanta, Ga. (Dragon.)
Gates, C. S.—Westminster St., Bellows Falls, Vt. (Ford, Rambler, Jackson.)
Gates, Geo. W.—Windsor Locks, Conn. (Pope-Waverley, Franklin.)
Gates, L. Frank.—Oshkosh, Wis. (Premier.)
Gathout, Chas. W.—160 Broad St., Newark, N. J. (Jackson.)
Gavitt Auto & Supply Co.—Newton, Kan. (White.)
Gawthorp & Wister.—244 N. Broad St., Philadelphia, Pa. (Elmore.)
Gay, R. A.—Effingham, Ill. (Waltham.)
Gebhart, E.—Whitesville, Mo. (Holsman.)
Geerish, W. A.—Enderlin, N. C. (Mitchell.)

Geisel Automobile Co.—36 Dwight St., Springfield, Mass. (Winton.)
Geitz, Fred.—205 N. Main St., St. Louis, Mo. (Holsman.)
General Motor Car Co.—240 N. Broad St., Philadelphia, Pa. (Autocar.)
General Motor Car Co.—14th and Valencia Sts., San Francisco, Cal. (Locomobile, Fiat.)
General Vehicle Co.—62d St. and Broadway, New York City. (General Vehicle trucks.)
Genesee Motor Vehicle Co.—Court & Exchange Sts., Rochester, N. Y. (Corbin.)
Geneva Automobile Co.—145 Castle St., Geneva, N. Y. (Cadillac); garage; repairing; supplies.
George, Edwin S.—Detroit, Mich. (Oldsmobile.)
Gerrish, W. A.—Enderlin, N. Dak. (Mitchell.)
Getchell, C. D.—Houlton, Me. (Cadillac.)
Gever, Clinton.—Muncie, Pa. (Cadillac.)
Geyler & Levy.—390 Wabash Ave., Chicago, Ill. (Autocar, Lozier.)
Gibson Auto Co.—238 Massachusetts Ave., Indianapolis, Ind. (Ford, Premier); repairing.
Gibson & Walker.—Portland, Ore. (Dolson.)
Giesey, E. M.—Wheeling, W. Va. (Jewel.)
Gifford, T. J.—14 Main St., New Bedford, Mass. (Mora.)
Gilbert, Chas.—174 Calhoun St., Battle Creek, Mich. (Ford.)
Gilbert, Fred E.—39 W. Forsythe St., Jacksonville, Fla. (Atlas, Reo, National, Rambler, Maxwell, Stoddard-Dayton.)
Gill Electric Co.—Tyrone, Pa. (Reo.)
Gillet, F. B.—Jonesville, Vt. (Cadillac.)
Gilley, H. E.—1158 S. Main St., Los Angeles, Cal. (Auburn, Sunset.)
Gillies, J. W.—Haverstraw, N. Y. (Franklin.)
Gilman Distribution Agency, M. A.—Westfield, Mass. (Haynes.)
Gilmore, W.—262 N. Broad St., Philadelphia, Pa. (Deere.)
Ginter, J. M.—18 Walnut St., Wooster, Ohio. (Reo.)
Girard Cycle Co.—Lincoln, Neb. (Indian, Queen.)
Girard Motor Car Co.—236 N. Broad St., Philadelphia, Pa. (Cleveland.)
Gilson Auto Co., L. C.—881 Congress St., Portland, Me. (Ford, Premier, Reo, Stanley.)
Githens Bros. Co.—1328 Michigan Ave., Chicago, Ill. (Oldsmobile, Stearns); repairing.
Gladding, Leon A.—123 Main St., New Britain, Conn. (Pope-Hartford.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Gladke, Morris.—101 E. Water St., Elmira, N. Y. (Thomas Flyer.)
Gleason, Dr. E. E.—Port Townsend, Wash. (Waltham.)
Glenn, C. L.—Spokane, Wash. (Gale.)
Glenn, James H.—Caribou, Me. (Cadillac.)
Glenn, W. J.—Kenton, Ohio. (Maxwell.)
Glenny, Walter R.—20 W. Barnard St., West Chester, Pa. (Cadillac.)
Glide Motor Car Co.—327 Baronne St., New Orleans, La. (Glide.)
Glisan, A. E.—Cumberland, Md. (Cadillac.)
Globe Automobile Exporters, The.—43 Cedar St., New York City. (De Dion, Bouton, Spyker.)
Glosser, S. A.—Jersey Shore, Pa. (Cadillac.)
Gloyd, S. M.—Oklahoma City, Okla. (Wayne.)
Godley, Harry.—3780 Highland Ave., Pittsburg, Pa. (Matheson.)
Golden, Percy.—Catskill, N. Y. (Maxwell.)
Golterman & Sons, Chas.—Foristell, Mo. (Waltham.)
Googins, Frank & Henderson.—Walla Walla, Wash. (Archer. Ford.)
Goodwin Motor Car Co.—6th & Mulberry Sts., Des Moines, Iowa. (Mason. Rambler.)
Goodyear Tire & Rubber Co.—Akron, O. (Rapid.)
Goold & Johnson.—Montford, Wis. (Cadillac.)
Gordon, J. W.—Barre, Vt. (Haynes.)
Gorham & Newport.—Wauponsee. Ill. (Cartercar.)
Gorham, R. W.—Mt. Kiscoe, N. Y. (Northern.)
Gorman, J. H.—Pottsville, Pa. (Maxwell.)
Gorson's Auto Exchange.—617-619 Arch St., Philadelphia, Pa. (Second-hand cars.)
Goshen Automobile & Supply Co.—Goshen, Ind. (Lambert. Maxwell. Cadillac.)
Gottschalk, C. F.—Copenhagen. Denmark. (Monarch.)
Gould & Sons, A. R.—415 Linden St., Scranton, Pa. (Thomas Flyer, Cadillac.)
Gould Motor Car Co.—53 S. Royal St., Mobile, Ala. (Cadillac.)
Gourley, R. J.—Springfield. Ill. (Monarch); supplies.
Granagan, P. J.—Jackson St., Sandusky, Ohio. (Ford); garage; repairing.
Grant & Bros. Auto Co.—744 Woodward Ave., Detroit, Mich. (Buick, Thomas Flyer.)
Grant, W. C.—Winchester, Ind. (Holsman.)

Graphic Cycle & Auto Works.—West Hampton Beach, N. Y. (Cadillac, Oldsmobile, Reo.)
Grappel & Schneider.—Jerseyville, Ill. (Lambert.)
Graschoff, Albert W.—West Hoboken, N. J. (Pierce, Rambler.)
Graves & Conroy.—Northampton, Mass. (Reo.)
Gray Auto Co.—1548 Broadway, Denver, Colo. (Stanley.)
Gray, Chauncey W.—5 Taggart Block, Watertown, N. Y. (Franklin.)
Gray, W. C.—Patchogue, Long Island, N. Y. (Maxwell.)
Grayhil, S. G.—Elizabethtown, Pa. (Cadillac, Winton.)
Green, C. F.—Waynoka, Okla. (Cadillac.)
Green, J. W., Jr.—Main St., Danbury, Conn. (Winton.)
Greene & Warnick.—Stewart St., -Amsterdam, N. Y. (Pope-Toledo, Stevens-Duryea); garage; repairing; supplies.
Greene Motor Car Co.—90 Washington St., Newark, N. J., and Montclair, N. J. (Oldsmobile, Locomobile.)
Greenfield Automobile Co.—21 Federal St., Greenfield, Mass. (Rambler. Ford); garage; repairing; supplies.
Greenleaf, G. G.—Providence, R. I. (Springfield.)
Greenlease, Robert C.—1316 E. 15th St., Kansas City, Mo. (Thomas Flyer.)
Greensburg Auto Co.—Greensburg, Pa. (Peerless.)
Greenville Automobile Co.—Greenville, S. C. (Reo.)
Greenwell Seagraves Co.—5023 Delmar St., St. Louis, Mo. (Haynes.)
Greenwood Bros. & Co.—Gardner, Mass. (Knox.)
Greenwood, E. A.—2nd St., Laramie, Wyo. (Mitchell, Rambler.)
Gregory, Wm.—600 N. Main St., Los Angeles, Cal. (Moline.)
Greer Motor Car Co.—60-68 W. Van Buren St., Chicago, Ill. (Pungs-Finch); repairing.
Green-Robbins Co.—1501 S. Main St., Los Angeles, Cal. (Mitchell); garage.
Griep, H. C.—Carthage, Mo. (Maxwell.)
Griffin & Kilmer.—Chicago. Ill. (Smith.)
Griffin Motor Car Co.—118 W. Wayne St., Ft. Wayne, Ind. (National well, White.)
Griffin, N. D.—99 N. Fulton ville, N. Y. (Pope-Har. Toledo. Pope-Waverley.)
Grinnell Garage Co.—Grir (Ford, Reo.)
Grisinger, A. H.—Santa Cru. (Northern.)
Griswold, A. H.—Holly, Colo. , bler, Jackson.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Griswold, A. H.—Garden City, Kan. (Jackson.)
Griswold, T. F.—Covina, Cal. (Maxwell.)
Groff, A. C.—Main St., Sellersville, Pa. (Rambler.)
Grosshaus, L.—Sutton, Neb. (Waltham.)
Grossman, Geo. J.—1649 Broadway, New York City. (Cadillac.)
Groth, Geo. H.—Hillsboro, O. (Jewel, Waltham.)
Grover & Danbar.—11 W. Canal St., Wabash, Ind. (Rambler, White, Jewel, Pope-Waverley.)
Grover, W. H.—Norfolk, Va. (Ford, Reo, Premier, Maxwell.)
Groves & Co., H. B.—600 Pierce St., Sioux City, Ia. (Buick, Cadillac, Thomas Flyer, Pope-Waverley, North-ern.)
Grow Automobile Co.—Osage, Iowa. (Mora.)
Grow Auto Garage & Machine Shop.—300 F St., Marysville, Cal. (Oldsmobile, Winton); garage; repairing.
Guerra & Co.—Merida, Yucatan, Mexico. (Northern.)
Gugin, Robt.—550 Seymour St., Vancouver, Canada. (Franklin.)
Gulf Auto & Machine Works.—101 Franklin St., Tampa, Fla. (Franklin.)
Guistine & Waskey.—Madison, S. Dak. (Buick); garage; repairing.
Gump Automobile Co., A. W.—1118 S. Main St., Los Angeles, Cal. (Jackson, Glide.)
Gunby Co., L. W.—Salisbury, Md. (Atlas trucks.)
Gunther Bros.—1633 Madison Road, Cincinnati, Ohio. (Royal Tourist.)
Gunther, Jos. F.—1240 Michigan Ave., Chicago, Ill. (Apperson.)
Gunthorpe, McKean Co.—Mobile, Ala. (Maxwell.)
Gurnee, B. S.—Hanford, Cal. (Ford, Buick, Auburn, Reo); garage; repairing.
Gustin Auto Co.—1309 Sycamore St., Cincinnati, Ohio. (Lambert.)
Gutches & Smith.—Havana, Cuba. (Knox.)

H.

H Auto Co.—Main St., Hack-
 sack, N. J. (Maxwell); garage; re-
 tor Car Co.—218 Paterson
 son, N. J. (Manhattan
 garage; repairing.
H, W. Y.—15 N. Main St., Man-
 ster, N. H. (Rambler, Queen);
 age; repairing; supplies.
H, William.—1308 Cascade Ave.,
 Colorado Springs, Colo. (Isotta.)

Hagman & Hammerly.—1305 Michigan Ave., Chicago, Ill. (Jewel, Deere, Cartercar.)
Hahn & Hahn.—Bridgeton, N. J. (Ford.)
Haigh, Chas.—Boston, Mass. (Pennsylvania.)
Haines, Egbert.—Goshen, Ind. (White.)
Hale, E. T. (University Garage).—New Haven, Conn. (Knox.)
Hales, J. C.—Wilson, N. C. (Ford.)
Halladay, Floyd.—Hotel Downey, Lansing, Mich. (Buick.)
Hall & Son, E. O.—Honolulu, Hawaiian Islands. (Cadillac, Pope-Hartford, Franklin.)
Hall Bros.—1613 Euclid Ave., Cleveland, O. (Cartercar, Reliance, Rapid, Climax.)
Hall, C. A.—Des Moines, Iowa. (Maxwell.)
Hall, C. R.—Collingwood, N. J. (Cadillac.)
Hall, E. G.—111 E. Broadway, Brownwood, Tex. (Cadillac); garage; repairing.
Hall, E. H.—Prairie City, Ore. (Waltham.)
Hallett & Son, J. N.—Carson City, Mich. (Jackson.)
Hall, John W.—10th Ave., Clinton, Ia. (Maxwell.)
Hall, Spencer.—1401 Park St., Racine, Wis. (Holsman.)
Halsey Automobile Co.—3910 Olive St., St. Louis, Mo. (Buick, Packard, Stevens-Duryea, Franklin, Knox.)
Halverson, H.—White Water, Wis. (Cadillac.)
Ham & Ross.—23 S. College St., Charlotte, N. C. (Maxwell); garage; repairing.
Hamerstrom, F. N.—Care of Trenton Rubber Mfg. Co., Trenton, N. J. (Dragon.)
Hamill, Colonel.—San Juan, Porto Rico. (Franklin.)
Hamill, W. D.—601 W. 3rd St., Williamport, Pa. (Baker.)
Hamilton Auto Co.—206 N. Broad St., Philadelphia, Pa. (Stoddard-Dayton.)
Hamilton Auto Co.—Washington, D. C. (Stoddard-Dayton.)
Hamilton Auto Co.—2312 Madison Ave., Baltimore, Md. (Stoddard-Dayton.)
Hamilton Automobile Co.—1251 Michigan Ave., Chicago, Ill. (Panhard, Mercedes, Isotta.)
Hamilton Garage Co.—133 & 135 King St., West Hamilton, Canada. (Oldsmobile, Franklin, Maxwell); garage; repairing.
Hamilton, J. H.—Charlotte, N. C. (Pope-Hartford.)
Hamilton, Harry.—Greenburg, Ind. (Rambler.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Hamilton Motor Car Co.—26 N. 2nd St., Hamilton, Ohio. (Buick, Elmore); garage; repairing.

Hamilton, P. H.—Youngstown, Ohio. (Jewel.)

Hamley, E. A.—Ryson, Wis. (Holsman).

Hamlin, R. C.—1806 S. Main St., Los Angeles, Cal. (Franklin, Lozier.)

Hammend, J. W.—79-81 W. Main St., Fredonia, N. Y. (Waltham.)

Hampden Auto Co.—60 Main St., Springfield, Mass. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Hanauer Automobile Co.—118 E. 7th St., Cincinnati, O. (Locomobile, Winton.)

Hanford Agricultural Works.—Hanford, Cal. (Oldsmobile, Winton.)

Hankey & Congdon.—414 Main St., Santa Anna, Cal. (Pope-Waverley, Royal.)

Hankins Bros.—Elsie, Mich. (National.)

Hankinson & Thompson.—Pine Bluff, Ark. (Cadillac.)

Hanley, I. E.—Huntington, W. Va. (Jewel.)

Hannan, Geo. E.—1441 Welton St., Denver, Colo. (Jewel, Jackson.)

Hannon & Henry Motor Car Co.—29-31 Catherine St., Ogdensburg, N. Y. (Buick, Cadillac); garage, repairing.

Hansen, Chas.—1406 Grand Ave., Kansas City, Mo. (Indian.)

Hansen Machine Works.—Helena, Mont. (Cadillac.)

Hansom, A.—Alpena, Mich. (Maxwell.)

Hans Motor Car Co.—424 S. 4th St., Minneapolis, Minn. (Stearns, Colt runabout.)

Hanson, N. R.—Huron, S. Dak. (Jackson.)

Hanway, H. D.—Bell Air, Md. (Cadillac.)

Hara, J. S.—Merriton, Canada. (Waltham.)

Harbottle Co.—Watertown, N. Y. (Waltham.)

Hard, Dr. A. D.—Marshall, Minn. (Waltham); repairing.

Harder's Gun Works.—Clearfield, Pa. (Waltham, Thomas, Buick, Franklin, Cadillac, Pope-Waverley); garage; repairing.

Harl, John C.—Punxsutawney, Pa. (Maxwell.)

Harlow, Wm. O.—Kalamazoo, Mich. (Maxwell.)

Harman, A. E.—10th and Granby Sts., Norfolk, Va. (Mitchell.)

Harmon, K. R.—10th & Gramby Sts., Norfolk, Va. (Waltham, Mitchell.)

Harmon, H. A.—87 Cross St., Portland, Maine. (American Mors, White.)

Harness, Wieder Co.—Calumet, Mich. (Maxwell.)

Harpers Garage Co.—Beverly, Mass. (Reo, Premier, National.)

Harrington, F. J.—Newark, O. (Model, Maxwell.)

Harrington, John S.—36 Central St., Worcester, Mass. (Thomas Flyer.)

Harris & Dunlap.—Lompec, Cal. (Reo.)

Harrisburg Auto Co.—3rd St. & Hamilton Ave., Harrisburg, Pa. (Stanley, Reo, Rambler, Logan, National, Babcock); garage; repairing.

Harris Steam Engine Co., W. A.—Park and Promenade St., Providence, R. I. (Mitchell.)

Harrison Auto Co., W. T.—1804 Fourth Ave., Birmingham, Ala. (Cadillac.)

Harrison Co., H. O.—1210 S. Main St., Los Angeles, Cal. (Peerless, Oldsmobile, Corbin.)

Harrison Garage, The.—310 Harrison St., Syracuse, N. Y. (Dolson, Northern.)

Harrison, Gorham.—Rockford, Ill. (Oldsmobile.)

Harrolds Motor Car Co.—233-37 W. 54th St., New York City. (Pierce Arrow.)

Hart, A. V.—30 Carleton St., Rochester, N. Y. (Thomas Flyer, Elmore, Haynes, Studebaker.)

Hart, J. M.—Oroville, Cal. (Rambler, Reo.)

Hartel, J. V.—Doylestown, O. (Holsman.)

Hartford Suspension Co.—67 Vestry & 212 W. 88th St., New York City. (Gobron-Brillie); garage; repairing.

Hartley, C. H.—Waynesburg, Pa. (Maxwell.)

Hartman & Co., Ltd.—230 Main St., Nashua, N. H. (Franklin.)

Hartwell, Guy J.—Mobile, Ala. (Glide.)

Harvey, L. B.—Bet. M. & N St., Sacramento, Cal. (Rambler.)

Hasbrouck Motor Works, Inc.—155 Water St., New London, Conn. (Rambler.)

Hass Electric & Mfg. Co., R.—Springfield, Mass. (De Luxe, Kisselcar.)

Hatcher & Caldwell.—Springfield, Ill. (Glide.)

Hathaway, Gardner R.—Marblehead, Mass. (Ford.)

Hathaway, S. T.—11th & Wewatta Sts., Denver, Colo. (Indian.)

Hathorn Auto Co.—Cor. 5th & Washington Sts., Mason City, Iowa. (Winton, Cadillac, Northern); garage; repairing.

Haug Bros. & Nellerr
Henry Ave. and I
peg, Can. (Glide.)

Haven, Herbert.—1
Denver, Colo. (Atteron.)

Havens, Beckwith.—Ti
tham.)

Havens, John.—Washingt.
(Cadillac.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Haviland, C. G.**—27 Stevens St., Danbury, Conn. (Ford.)
- Hawk, Frank**—Angola, Ind. (Cadillac.)
- Hawkey & Kelder**—34 Market St., Poughkeepsie, N. Y. (Maxwell.)
- Hawkins, Chas. T.**—Erie, Pa. (Knox.)
- Hawkinson, O.**—Maynard, Minn. (Waltham); garage; repairing.
- Hawkins-Pembroke Auto Co.**—609 French St., Erie, Pa. (Maxwell.)
- Hayes & Dam.**—Honolulu, Hawaiian Islands. (Frayer-Miller.)
- Hayes, Jr., A. H.**—428 Golden Gate Ave., San Francisco, Cal. (Rainier, Frayer-Miller.)
- Hayes, Walter.**—1116 Main St., Buffalo, N. Y. (Jewel, White.)
- Haynes Automobile Co.**—1310 Staunton Place, Washington, D. C. (Haynes.)
- Haynes Automobile Co.**—1420 Michigan Ave., Chicago, Ill. (Haynes); Haynes cars repaired.
- Haynes Automobile Co.**—1715 Broadway, New York City. (Haynes); repairing Haynes cars only.
- Haynes Automobile Co.**—220 S. 6th St., Minneapolis, Minn. (White.)
- Haynes Motor Car Co.**—1030 Golden Gate Ave., San Francisco, Cal. (Haynes); repair shop.
- Haynes, C. E.**—Cadillac, Mich. (Elmore.)
- Hays Bros.**—109 S. 4th St., Waco, Tex. (Buick.)
- Hays, Carl W.**—Lexington, Mo. (Monarch.)
- Haywood & Summers.**—Romney, Ind. (Ford.)
- Heald & Co., J. C.**—Independence, Iowa. (Winton.)
- Heald, J. Franklin.**—Sheridan, Wyo. (Jewel.)
- Hearsey Vehicle Co.**—113 W. Market St. Indianapolis, Ind. (White, Rambler, Marmon.)
- Heoth, Ed.**—Oxford, Ind. (Haynes.)
- Hector, C. B.**—103 Main St., Napa, Cal. (Rambler, Napier, Waltham.)
- Hedge, E. P.**—107 Lincoln Ave., Hastings, Neb. (Cadillac.)
- Hedges, S. P.**—13 Main St., Greenport, N. Y. (Ford.)
- Hege Co., Oscar F.**—317 Main St., Winston-Salem, N. C. (Cadillac); garage; repairing.
- Heerman & Bros., Frank.**—117-123 E. 5th St., Austin, Tex. (Jewel); repairing.
- Held, A. S.**—Freeport, Ill. (Winton.)
- Heller, F. L.**—Caldwell, N. J. (Lambert.)
- Heller, L. L.**—1015 Kilmer Bldg., Binghamton, N. Y. (Marmon.)
- Heller Spawn Motor Car Co.**—Binghamton, N. Y. (Marmon.)
- Hemwall, John.**—46th St. and Washington Blvd., Chicago, Ill. (Buick.)
- Henderson Auto Co.**—4th Ave., Cedar Rapids, Iowa. (Buick, Rapid, Cadillac, Franklin, Pope-Waverley.)
- Henderson, Corkrum & Co.**—Walla Walla, Wash. (Ford.)
- Henderson Iron Works & Supply Co.**—Spring, Caddo and Commerce Sts., Shreveport, La. (Ford.)
- Henley, J. L.**—Cresco, Iowa. (Holsman.)
- Henley, M. C.**—Richmond, Ind. (Haynes.)
- Henning, Jos. A.**—205 Stevens Ave., Mt. Vernon, N. Y. (Winton.)
- Henry & Sheffer Co.**—Greenburgh, Pa. (Cameron.)
- Henry Auto Co.**—Edwards St., Henry, Ill. (Holsman, Rambler.)
- Henry, Chester C.**—Summit, N. J. (Pope-Hartford.)
- Henshaw Motor Car Co.**—288 Columbus Ave., Boston, Mass. (Haynes.)
- Henzler, C. W.**—Bismark, N. Dak. (Buick.)
- Herbst, Frank.**—110 S. 2nd St., Wilming-ton, N. C. (Maxwell.)
- Hering, W. C.**—26 E. 4th St., Mansfield, O. (Jackson, Ford.)
- Herkimer Motor Car Co.**—124-26 Albany St., Herkimer, N. Y. (Maxwell); garage; repairs; supplies.
- Hermitage Auto Co., The.**—170 3rd Ave., Nashville, Tenn. (Stevens-Duryea.)
- Hernandez, J. C.**—90 Wall St., New York City. (Locomobile; export only.)
- Herrick, A. E.**—Pocono Lake, Pa. (Elmore.)
- Herrick Bros.**—Bethel, Me. (Maxwell, Reo); repairing.
- Hess & White's New Garage.**—61 S. 3rd St., Newark, O. (National, Mitchell.)
- Hess, J. Archie.**—Seattle, Wash. (Corbin.)
- Hewitt, R. M.**—Lansing, Mich. (Carter-car.)
- Heyer, Arthur P.**—34 Valley Road, Montclair, N. J. (Haynes.)
- Heyer, Arthur P.**—Bloomfield, N. J. (Haynes.)
- Hibbard Automobile Co.**—187 Wisconsin St., Milwaukee, Wis. (Pierce Arrow, Oldsmobile, Haynes.)
- Hickman, Kraemer & Croll Co.**—508 Merrill Bldg., Milwaukee, Wis. (Cartercar.)
- Hickok Mfg. Co., W. O.**—North & Canal Sts., Harrisburg, Pa. (Mitchell.)
- Hiestand, Dr. Daniel.**—140 N. 7th St., Allentown, Pa. (Maxwell.)
- Hiland Automobile Co.**—5811-17 Center Ave., Pittsburgh, Pa. (Peerless, Buick); garage; repairing.
- Hileman, E. E.**—New Castle, Pa. (Queen, Rambler.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Hill & Beeson Auto Co.—20 E. Ohio St., Indianapolis, Ind. (Monarch, Auburn.)
Hill & Holt.—Medford & Walnut Sts., Somerville, Mass. (Columbia, Rambler, Maxwell.)
Hill, C. H.—234 Main St., Poughkeepsie, N. Y. (Reo, Premier.)
Hill, Geo. R.—20 Main St., Towanda, Pa. (Mitchell.)
Hill Motor Car Co.—Haverhill, Mass. (Maxwell.)
Hills Auto Station.—125 Church St., Willimantic, Conn. (Maxwell, Stanley, Ford.)
Hills, Horace B.—5 Park Square, Boston, Mass. (Rochet-Schneider.)
Hills & Kennedy.—24 Main St., Batavia, N. Y. (Maxwell.)
Hills Motor Car Co.—130 N. Broad St., Philadelphia, Pa. (Royal, Rochet-Schneider.)
Hillegas, E. N.—640 Main St., Riverside, Cal. (Cameron, Stoddard-Dayton.)
Hinkle, G. W.—Harvard, Ia. (Holsman.)
Hinman, B.—Newport, Vt. (Buick.)
Hinman, J.—326 Main St., Oshkosh, Wis. (Haynes.)
Hipkins, F. E.—St. Paul, Minn. (Waltham.)
Hipp, J. C.—347 Euclid Ave., Cleveland, Ohio. (Moline.)
Hixson-Wittmer Auto Co.—16 E. 5th Ave., Columbus, O. (Premier.)
Hoar Auto Co.—Tombstone, Arizona. (Queen.)
Hobbie, L. W.—Hampton, Ia. (Holsman.)
Hodge, Dr. M. C., Jr.—308 E. Grace St., Richmond, Va. (Maxwell.)
Hodges, W. L.—10 Woodlawn Ave., Saratoga, N. Y. (Waltham.)
Hofacker, A. W.—Bottineau, N. Dak. (Waltham.)
Hoff, Jos. B.—106-118 Main St., Lakewood, N. J. (American Mercedes, Locomobile, Pope Waverley, Columbia Electric); garage; repairing.
Hoffer & Sons, D. B.—126 S. 10th St., Reading, Pa. (Logan, York-Pullman, Queen, De Luxe.)
Hoffer, J. N.—Homestead, Pa. (Cameron.)
Hoffman & Shimer.—21 Broad St., Bethlehem, Pa. (Reo.)
Hoffman Hardware Co., Jos.—Sharon, Pa. (Elmore.)
Hohenshell, W. T.—Merced, Cal. (Moline.)
Hokanson Auto Co.—Pinckney & Doty Sts., Madison, Wis. (Buick, Winton, Cadillac, Pope-Waverley.)
Holcker Bros. Buggy Co.—Crestline, O. (Auburn.)

Holcomb Co.—105 Goffe St., New Haven, Conn. (Cadillac, Franklin); garage; repairing.
Holder, H. A.—Gallatin, Tenn. (Holsman.)
Holden, George N.—17 Dwight St., Springfield, Mass. (Indian.)
Holland & Campbell.—Clarksdale, Miss. (Buick.)
Hollywood Motor Co.—Newark, N. Y. (Marion.)
Holmes & Bros., Robert.—Danville, Ill. (Holsman, Cadillac, Winton, Franklin.)
Holmes & Childs Motor Co.—355 W. 3rd St., Williamsport, Pa. (Winton, Pope-Toledo.)
Holmes & Co., G. E.—1502 Michigan Ave., Chicago, Ill. (Welch, Queen.)
Holmes Booth Auto Co.—636 55th St., Cleveland, Ohio. (Pope-Hartford.)
Holmes Co., M. A.—422 Michigan Ave., East Lansing, Mich. (Jackson.)
Holst Bros.—139 E. 9th St., Los Angeles, Cal. (Autocar.)
Hol-Tan Co.—Broadway & 56th St., New York City. (Fiat, Hol-Tan.)
Holt, E. E.—Main St., Fort Fairfield, Me. (Dolson, Reo, Waltham.)
Holt, Eugene.—Burlington, N. C. (Maxwell.)
Holway, Chas.—La Crosse, Wis. (Rambler.)
Holyoke Auto Garage Co.—Divison St., Holyoke, Mass. (Knox.)
Homan & Shultz.—38 W. 62nd St., New York City. (Rambler, National.)
Homan, E.—Boulevard, near Lembeck Ave., Jersey City, N. J. (Rambler, National.)
Homer Cycle Co.—Bridgeton, N. J. (Cadillac.)
Homewood Automobile Co.—7250 Kelly St., E. E., Homewood, Pittsburg, Pa. (Frayer-Miller.)
Honkawara, Paul.—Palmer, Mich. (Waltham.)
Hooker, Stanley A.—216 E. 3rd St., Cincinnati, Ohio. (Maxwell, York-Pullman.)
Hoopes, Henry R.—West Chester, Pa. (Elmore.)
Hopkins, C. C.—729 Gough St., San Francisco, Cal. (Indian.)
Hoppenyon Auto Co., The.—301 2nd St., E., Ashland, Wis. (Ford, Buick, Cadillac); garage; repairing.
Hornburg Auto Co.—-
 kane, Wash. (Doison,
Horner, P. B.—Hutchins
 lac.)
Horton & Co.—-
 illac.)
Horton & C
 (Cadillac.)
Horton, E. P.—
 White Plains, N. Y. (Maxwell)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Horton, W. F.**—491 Richmond Ave., London, Ont., Canada. (Oldsmobile.)
- Hot Springs Automobile Co.**—207 Central Ave., Hot Springs, Ark. (Reo.)
- Houghton Implement Co.**—201-225 N. Ninth St., Grand Forks, N. Dak. (Jackson, Gale.)
- Haupt, Harry S., Co.**—139 S. Broad St., Philadelphia, Pa. (Thomas Flyer); garage; repairing.
- Haupt, Harry S. Co.**—63rd St. and Broadway, New York City. (Thomas Flyer); garage; repairing.
- Haupt, Harry S., Co.**—213 Clinton Ave., Newark, N. J. (Thomas Flyer.)
- House & Wesley.**—Market & 14th St., Wheeling, W. Va. (Reo, Premier.)
- House, C. E.**—Manchester, Conn. (Pope-Hartford.)
- Houston Motor Car Co.**—417 San Jacinto St., Houston, Tex. (Pierce Arrow, Stevens-Duryea, Cadillac, Stoddard-Dayton); garage; repairing.
- Hovey, Bushey Co.**—409 Golden Gate Ave., San Francisco, Cal. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Hovey, Geo. L.**—North Anson, Me. (Cadillac, Winton.)
- Howard Auto Co.**—De Moines, Ia. (Glide, Stoddard-Dayton.)
- Howard Auto Co.**—489 Golden Gate Ave. San Francisco Cal. (Buick, Apperson.)
- Howard Co., F. H.**—58 Galen St., Watertown, N. Y. (Glide.)
- Howard Crowingshield Garage, The.**—619 N. Spruce St., Colorado Springs, Colo. (Premier.)
- Howell, Dr. Harrison.**—Wilmington, Del. (Waltham.)
- Howell, Dr. Fleming.**—Clarksburg, W. Va. (Waltham.)
- Howe, C., & Co.**—Minden, Neb. (Earl.)
- Howe Motor Car Co.**—11 Park Ave., Paterson, N. J. (Reo, Premier); garage; repairing.
- Howes, Edgar A.**—Los Angeles, Cal. (Frayser-Miller.)
- Hoy, P. V.**—Main St., Norristown, Pa. (Pierce-Arrow.)
- Hoyer, T. M.**—Emmetsburg, Iowa. (Cadillac.)

cook, N. H. (El-

mys Corners, N. Y.

I **G.**—492 Main St., Spring-
(Crawford.)

K. J.—Wilton, Conn.

le, W. W.—Monroe, Mich. (Pope-
verley, Wayne.)

- Huber Automobile Co.**—378 Golden Gate Ave., San Francisco, Cal. (Smith, Richmond, Marvel.)
- Hudson Automobile Co.**—516 W. 145th St., New York City. (Lane, Springfield.)
- Hudson Automobile Garage.**—1318 Park Ave., Hoboken, N. J. (Reo, Ford.)
- Hudson County Auto Co.**—2593 Blvd., Jersey City, N. J. (Matheson, Winton.)
- Hudson, Chas. H.**—Hudson, Ky. (Atlas.)
- Hughes & Co., Chas. C.**—643 Maryland Ave., Washington, D. C. (Elmore.)
- Hughes Auto Co.**—816 Main St., Cincinnati, Ohio. (Stearns.)
- Hughes Co., Wm.**—Bough & Dyke St., Providence, R. I. (Reo, Premier.)
- Hughes, D. W.**—1001 Chestnut St., Philadelphia, Pa. (Manhattan.)
- Hughes, John R.**—130 Bank St., Waterbury, Conn. (Ford.)
- Hughes, S. A.**—Kingston, N. Y. (Elmore.)
- Hulhorst, F.**—Yutan, Neb. (Waltham.)
- Hulse, H. S.**—Circleville, O. (Maxwell.)
- Humphrey, Sehloot & Co.**—Linton, Ind. (Northern.)
- Hunter Automobile Co., Ossen.**—407 Golden Gate Ave., San Francisco, Cal. (Mitchell); repairing.
- Hunter Automobile Co., Ossen.**—50 W. St. John St., San Jose, Cal. (Mitchell); repairing.
- Huntsman Auto Co.**—Tuscon, Ariz. (Mitchell.)
- Huntsville Motor Car Co.**—Holmes St., Huntsville, Ala. (Ford.)
- Huotari & Co.**—Aberdeen, Wash. (Waltham.)
- Hurck Motor & Cycle Co.**—109 N. 12th St., St. Louis, Mo. (Indian.)
- Huron Auto & Electric Co.**—325 E. Water St. Port Huron, Michigan. (Northern, Cadillac.)
- Huss & Co., M. L.**—W. Buckeye St., Clyde, O. (Reo.)
- Huss, Henry, Jr.**—48 Valentine St., Mt. Vernon, N. Y. (Maxwell.)
- Hutchison & Smith.**—Hemstead, N. Y. (Ford, Autocar.)
- Hutchinson Bros.**—Rock Bay, Victoria, B. C. (Oldsmobile, Swift); repairing.
- Hutto & Company.**—Main & Laura Sts., Jacksonville, Fla. (Buick, Elmore, Cadillac.)
- Hymes, Herbert.**—Volga, S. Dakota. (Rambler.)
- Hyslop Bros.**—209 Yonge St., Toronto, Canada. (Cadillac, Humber, Beeston.)

I

Iams Automobile Co.—5986 Center Ave., Pittsburg, Pa. (Royal.)

Ideal Machine & Auto Co.—19 S. 9th St., Lebanon, Pa. (Cadillac, Franklin.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Idaho Auto & Electric Transit Co.—Room 306, Bank & Ins. Bldg., Dubuque, Iowa. (Rapid.)
Illinois Garage Mfg Co.—Water & Mill Sts., Pontiac, Mich. (Reo.)
Illsley, Inc., Frank P.—1329 Michigan Ave., Chicago, Ill. (Stevens-Duryea.)
Imperial Garage.—664 Halsey St., Brooklyn, N. Y. (Rambler.)
Imperial Motor Co.—1094 Main St., Buffalo, N. Y. (Buick, Packard, Pope-Hartford, Pope-Waverley.)
Independent Auto Co., Ltd.—1016 Common St., New Orleans, La. (Standard-Dayton.)
Indiana Auto Co.—220 E. New York St., Indianapolis, Ind. (Pope-Hartford, Baker, Autocar, Winton, Franklin, Peerless, Thomas Flyer.)
Indianapolis Motor Car Co.—111 Kentucky Ave., Indianapolis, Ind. (Rapid, Dragon.)
Indianapolis Motor Car Co.—West Plains, Mo. (Dragon, Logan.)
Inks, W. B.—Ligonier, Ind. (Ford.)
Inland Auto Co.—Spokane and Alder Sts., Walla Walla, Wash. (Buick, Franklin, Oldsmobile, Thomas.)
Insular Auto Co.—San Juan, Porto Rico. (Knox.)
International Automobile Co.—101 Burnside Place, Montreal, Canada. (Dragon, Gale, Wayne.)
International Automobile Co.—Toronto, Canada. (Wayne.)
International Automobile Exchange, The.—250 W. 49th St., New York City. (2nd-hand cars.)
International Motor Car Co.—514-16 N. Broad St., Philadelphia, Pa. (Walter, Darracq.)
Interstate Auto & Supply Co.—Sioux City, Ia. (Premier.)
Interurban Motor Car Co.—1920 Broadway, Oakland, Cal. (American, Knox.)
Interurban Motor Traction Co.—W. Main St., Lexington, Ky. (Manhattan.)
Iowa Auto Co.—Ottumwa, Iowa. (Ford.)
Iowa Auto & Supply Co.—407 4th St., Des Moines, Ia. (White, Thomas Flyer.)
Iowa Vulcanizing & Tire Co.—Davenport, Iowa. (Pope-Hartford, Pope-Toledo, Babcock Electric.)
Irbis, R. V.—Laurens, S. C. (Maxwell.)
Iroquois Motor Car Co.—Seneca Falls, N. Y. (Iroquois.)
Irvin & Co., Richard.—25 Broad St., New York City. (Maxwell.)
Isbell, J. J.—113 N. Mitchell St., Kendallville, Ind. (Auburn.)
Isbell & Co., Wm. G.—1413 Michigan Ave., Chicago, Ill. (American, Simplex.)

Iseminger, Floyd G.—311 E. Front St., Bloomington, Ill. (Ford, Mitchell.)
Iseminger, Floyd G.—Normal, Ill. (Ford, Mitchell.)
Itala Import Co.—41 W. 65th St., New York. (Itala.)

J

Jack, M. L.—Rochester, Pa. (Rambler.)
Jacks, E. D.—Napa, Cal. (Royal, Buick, Thomas, Winton, Oldsmobile.)
Jackson Agency.—Des Moines, Ia. (Jackson.)
Jackson, C. A.—Lebanon, N. H. (Maxwell.)
Jackson Electric Supply Co.—225 W. 2nd St., Muscatine, Iowa. (Maxwell, Rambler.)
Jackson Motor Car Co.—103 Court St., Brooklyn, N. Y. (Jackson); garage; repairs.
Jacobs, H. W.—Akron, Colo. (Waltham.)
James Co., A.—1st & King Sts., La Crosse, Wis. (Winton.)
Janney, P. R.—6040 Hurst St., New Orleans, La. (Queen, Reo, Lambert.)
Janseen Auto Co., Orey.—310 Main St., Davenport, Ia. (Mitchell.)
Jarvis, Levi.—Pingree, N. Dak. (Jewel); repairing.
Jaynes & Co., W. C.—721 Main St., Buffalo, N. Y. (Knox, Royal.)
Jeffery & Co., Thos. B.—145 Columbus Ave., Boston, Mass. (Rambler.)
Jeffery & Co., Thos. B.—302-04 Wabash Ave., Chicago, Ill. (Rambler.)
Jeffery & Co., Thos. B.—455 Broadway, Milwaukee, Wis. (Rambler.)
Jeffery & Co., Thos. B.—3 Marshall St., Newark, N. J. (Rambler.)
Jeffery & Co., Thos. B.—207 N. Broad St., Philadelphia, Pa. (Rambler.)
Jeffery & Co., Thos. B.—121 Valencia St., San Francisco, Cal. (Rambler.)
Jeffords, J. B. W.—Charleston, S. C. (Waltham.)
Jeffords, Witherspoon.—58 Queen St., Charleston, N. C. (Maxwell, Waltham.)
Jeffries Auto Co.—207 W. California St., Oklahoma, Okla. (Cadillac, Lambert, Maxwell.)
Jenkins & Co., W. M.—286 Columbus Ave., Boston, Mass. (Mitchell.)
Jenkins Bros.—1607 W. Broadmond, Va. (Pope-Hartford.)
Jenkins Motor Co., E. A.—12 Columbia, S. C. (Stoddard.)
Jenkins, J. W.—237 Rutger, N. Y. (Jenkins Sp.)
Jenkins Motor Car Co., E.—St., Columbia, S. C. (Waltham, Maxwell)
Jenkins, T. B., Jr.—S
Jersey Shore Cycle Co.—Pa. (Winton.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Jewel Auto Co.—117 W. 16th St., Los Angeles, Cal. (Jewel.)
Jewel Automobile Co.—Washington, D. C. (Jewel.)
Jewel Automobile Sales Agency.—1375 Ontario St., Cleveland, O. (Jewel.)
Jewett, Alfred R.—Abington, Mass. (Cadillac.)
Jewett's Garage.—58 Pleasant St., Claremont, N. H. (Rambler, Maxwell); garage; repairs; supplies.
Jew, Garlick.—642 Madison Ave., Paterson, N. J. (Cadillac, Franklin, Haynes.)
Johnson, Alfred.—89-97 Orange St., New Haven, Conn. (Springfield.)
Johnson & Giles.—Tampa, Fla. (Buick.)
Johnson & Son, Geo E.—Chestnut St., New Paltz, N. Y. (Jackson, Ford.)
Johnson, E. C.—Compton, Cal. (Maxwell.)
Johnson, Dr. P. T.—Erie, Pa. (Frayer-Miller, Lambert.)
Johnson, C. H.—55 S. Forsythe St., Atlanta, Ga. (Stevens-Duryea.)
Johnson, C. W.—W. Peter St., Uniontown, Pa. (Franklin, Pope-Toledo, Pope-Hartford, Pope-Waverley.)
Johnson, Henry S.—Clayton, N. Y. (Waltham.)
Johnson, John E.—Central St., Fall River, Mass. (Cadillac.)
Johnson, P. A.—Cambridge, Ill. (Rapid, Glide.)
Johnson Service Co.—20th St. & Broadway, N. Y. (Johnson.)
Johnson's Garage.—Atlantic & Ohio Ave., Atlantic City, N. J. (Winton.)
Johnson-Shields Auto Co.—Long Beach, Cal. (Oldsmobile.)
Johnson, Walter B.—Essex Junction, Vt. (Buick.)
Johnson, Warren C.—Independence, Kan. (Jewel.)
Johnston Automobile Co.—235 Bedford Ave., Johnstown, Pa. (Queen, Wayne, Peerless, Rambler.)
Johnston, Chas. M.—232 5th Ave., Pittsburgh, Pa. (American Mors.)
Johnston, R.—12 N. Main St., Wilkesbarre, Pa. (Reo, Rambler, Maxwell, Cadillac, Knox.)
Joliet Auto & Garage Co.—100 Cass St., Joliet, Ill. (Winton.)
Jonas Automobile Co.—726 National Ave., Milwaukee, Wis. (Peerless, Cadillac.)
Jonas & Hopkins.—Mankato, Minn. (Rambler.)
Jones & Brandes.—109 Burlington Ave., Hastings, Neb. (Premier, Reo.)
Jones, C.—Beatrice, Neb. (Oldsmobile.)
Jones, E. M.—Sacramento, Cal. (Motor Racyle.)
Jones, E. M.—Los Angeles, Cal. (Motor Racyle.)

Jones, H. M.—1329 Michigan Ave., Chicago, Ill. (American Mercedes.)
Jones, Mark C.—Converse, Ind. (Waltham.)
Joo, Raymond S.—79 Orange St., Newark, N. J. (Frayer-Miller.)
Joplin Auto Co.—618-20 Wall St., Joplin, Mo. (Holsman.)
Jordan Automobile Co.—217 4th St., Minneapolis, Minn. (Locomobile, Peerless, Franklin, Corbin.)
Jordan, R. C.—Columbus, Ga. (Mitchell.)
Joslyn Automobile Co.—Rockford, Ill. (Rambler.)
Joy Auto Co., C. P.—368 Minnesota Ave., St. Paul, Minn. (Packard, Pope-Hartford, Pope-Waverley.)
Joyce Auto Co., F. G.—705 Chestnut St., Chattanooga, Tenn. (Buick, Thomas Flyer.)
Joyce, Ralph.—1531 Broadway, New York City. (2nd-hand cars.)
Jungclass Auto Co.—Reading Road & Avondale St., Cincinnati, O. (Dragon, Mitchell, Dolson.)

K

Kachline, J. C.—South Bethlehem, Pa. (Cameron.)
Kalbfleisch, G. C.—Tiffin, O. (Maxwell.)
Kamper & Range.—Monmouth, Ill. (Holsman.)
Kane-Champlin Co.—Ellicott and Tupper Sts., Buffalo, N. Y. (Premier, Reo.)
Kane, Francis M.—Seattle, Wash. (Wayne.)
Kappelman, J. A.—Linn, Kan. (Holsman.)
Karback Auto & Vehicle Co.—13th & Howard Sts., Omaha, Neb. (Jewel.)
Karlstrom & Co.—Frithi, Sweden. (Waltham.)
Katonah Garage.—R. R. Ave. and Allen Court, Katonah, N. Y. (Premier, Maxwell.)
Katz & Co., Frank.—Birmingham, Ala. (Haynes.)
Kaufman, Clyde B.—247 W. 3rd St., Williamsport, Pa. (Ford.)
Kaw Valley Auto Co.—3130 Main St., Kansas City, Mo. (Premier.)
Keats Auto Co., H. L.—87 7th St., Portland, Ore. (Thomas Flyer, Thomas Detroit, Pope-Toledo, Pope-Hartford, Pope-Waverley, Franklin, Buick, Oldsmobile); repairing.
Keefers Sons, Henry.—New Hyde Park, N. Y. (Reo.)
Keeler & Co., E.—253 W. 3rd St., Williamsport, Pa. (Cadillac, Buick, Thomas, Franklin, Pope-Hartford, Pope-Waverley.)
Keeley, F. W.—Royersford, Pa. (Crawford.)
Keene Auto Cycle Co.—Keene, N. H. (Maxwell.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Kehoe Company, The E. J.**—1659 Broadway, N. Y. City. (Continental); garage; repairing.
- Keim, H. B.**—Esbon, Kan. (Autocar.)
- Keir, J. L.**—310 N. Broad St., Philadelphia, Pa. (Renault.)
- Keiser-Vanleer Co.**—505-07 East St., Bloomington, Ill. (Rambler); supplies; repairing.
- Keith, B. B.**—226 W. 5th St., Mansfield, O. (Pope-Waverley.)
- Keith, Simmons & Co.**—316 Union St., Nashville, Tenn. (Mitchell.)
- Kelsey Motor Car Co.**—204 N. Broad St., Philadelphia, Pa. (Maxwell, Mors, Mora.)
- Kelly, Chas. F. W.**—Continental Rubber Works., Erie, Pa. (Haynes.)
- Kelly, J. B.**—212 2nd St., Portland, Ore. (White.)
- Kemp, D. W.**—129 W. 15th St., Minneapolis, Minn. (Earl.)
- Kemp, E. A.**—Greenville, Mich. (Jackson.)
- Kennedy Paint Co.**—Montgomery, Ala. (Reo.)
- Kent, M. H.**—Kenosha, Wis. (Waltham.)
- Kent, Morgan B.**—141 Massachusetts Ave., Boston, Mass. (Hotchkiss.)
- Kentucky Automobile Co.**—1051 3rd Ave., Louisville, Ky. (Cadillac, Peerless, Knox, Buick, Pope-Waverley); garage; repairing.
- Kenworthy, T.**—Winchester, Ind. (Auburn.)
- Kerr, M. W.**—571 S. Clinton St., Syracuse, N. Y. (Buick.)
- Kessler Machine & Supply Co.**—San Diego, Cal. (Maxwell.)
- Ketchum & Co.**—Bank & Spark Sts., Ottawa, Canada. (Oldsmobile, Ford); garage; repairing.
- Ketchum, J. P.**—60 Putnam St., Saratoga, N. Y. (Packard, Cadillac); garage.
- Keyes, John M.**—8 Walden St., Concord, Mass. (Pope-Toledo, Stanley.)
- Keystone Auto Co.**—5905 Center Ave., Pittsburg, Pa. (Stoddard-Dayton, Welch, Ford, Columbus, White.)
- Keystone Auto & Cycle Co.**—Titusville, Pa. (Pierce Arrow, Thomas, Stevens-Duryea, Buick, Franklin, Corbin.)
- Keystone Motor Car Co.**—1019 Market St., Harrisburg, Pa. (Rapid, York-Pullman, Maxwell.)
- Keystone Motor Car Co.**—240 N. Broad St., Philadelphia, Pa. (Buick, Packard.)
- Keystone Motor Car Co.**—644-646 Telegraph Ave., Oakland, Cal. (Blomstrom, Acme.)
- Kiese, D. F.**—Edon, Ohio. (Cadillac, Maxwell.)
- Killip, Oscar.**—150 S. State St., Elgin, Ill. (Jackson.)
- Kilpatrick, A. J.**—Lebanon, Pa. (Maxwell.)
- Kimball & Co., C. P.**—315 Michigan Ave., Chicago, Ill. (Rauch & Lang); repairing.
- Kimball, L. M.**—Arkansas City, Kan. (Waltham.)
- Kimball, R. R.**—2026 Farnam St., Omaha, Neb. (Stanley, Stevens-Duryea.)
- King, A. A.**—Lake Hopatcong, N. J. (Ford); repairing.
- King, B. F.**—Austin, Minn. (Columbia.)
- King, Chas. H.**—Bridgewater, Mass. (Maxwell.)
- King Garage Co.**—87½ W. Main St., Springfield, Ohio. (Cadillac.)
- King Piatt Auto Co.**—Cooperstown, N. Dak. (Rambler, Reo, Queen.)
- King, Russell G.**—Easton, Pa. (Jackson.)
- Kings Beach Garage.**—Lynn, Mass. (Glide.)
- Kings Bridge Garage.**—W. 230th St., nr. Broadway, New York City. (2nd-hand cars.)
- Kingston Garage.**—Grand & Prince Sts., Kingston, N. Y. (Ford, Rambler.)
- King, W. H.**—Wilton, Me. (Holsman.)
- Kinney & Alexander.**—Binghamton, N. Y. (Holsman.)
- Kinports Auto Co., M.**—Ephrata, Pa. (Ford.)
- Kinports Auto Co., M.**—126 E. Orange St., Lancaster, Pa. (Ford.)
- Kirchhoff & Cook.**—Hampshire, Ill. (Rambler.)
- Kirchdorfer Automobile Co.**—1702 Baxter Ave., Louisville, Ky. (Reo, Premier); repairing.
- Kirk Bros. Auto Co.**—915 Jefferson Ave., Toledo, Ohio. (Buick, Thomas Flyer, Studebaker.)
- Kirkham, I. C.**—Fulton St. & Bedford Ave., Brooklyn, N. Y. (Maxwell.)
- Kirkpatrick, L. B.**—Rochester, N. Y. (Holsman.)
- Kitts & Son, E. A.**—Corning, N. Y. (Jackson.)
- Kitzmiller & Vorhees.**—Flora, Ind. (Jewel.)
- Klauder, Francis.**—Philadelphia, Pa. (C. G. V.)
- Kline Co.**—1610 Michigan Ave., Chicago, Ill. (English & American Nap.)
- Klinger, A.**—Coldwater, Mich. (ton.)
- Kloppel, C. O.**—Leigh, N. Y. (tham.)
- Kneale & Kneale.**—Brooks (Waltham.)
- Knease, Henry.**—Iowa City (Rambler.)
- Knight, H. A.**—1911 Page St., San Francisco, Cal. (Austin.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Knight, Jacob.—Garwin, Ia. (Waltham.)
Knight's Central Station.—261 George St., New Haven, Conn. (Ford.)
Knowalsky, J.—Pittsburg, Pa. (Gale.)
Knowles, W. H.—Fulton and Jackson Sts., Ottawa, Ill. (Locomobile.)
Knowlton, E. C.—Sacketts Harbor, N. Y. (Waltham.)
Knox Auto Co. of Illinois.—1208 Michigan Ave., Chicago, Ill. (Knox); repairing.
Knox Automobile Agency.—31 McGraw Bldg., Detroit, Mich. (Knox.)
Knox Automobile Co.—1595 Broadway, New York. (Knox.)
Knox Automobile Co.—Wilberham Road, Springfield, Mass. (Knox.)
Koehler Sporting Goods Co.—845 Broad St., Newark, N. J. (Buick, Corbin, Pope-Waverley, Indian.)
Koenig Bros.—Broadway, bet. Central Ave. & Main St., Tarrytown, N. Y. (Premier, Reo); garage; repairs; supplies.
Koller Hardware Co.—Ponca City, Okla. (Waltham.)
Koyt, A. B.—Newton, N. J. (Holsman.)
Kraft & Co., E. L.—241 S. George St., York, Pa. (Maxwell.)
Kraft, Victor L.—44 N. Winter St., Rochester, N. Y. (Monarch.)
Kramer, Allen Motor Co.—227 S. Perry St., Attica, Ind. (Winton, Thoroughbred, Marsh.)
Kramer & Wroten.—St. Julien St., W., Savannah, Ga. (Studebaker.)
Krauss, Chas.—1406 Oxford St., Philadelphia, Pa. (Indian.)
Kreider Bros.—214 State St., Olean, N. Y. (Cadillac, Winton.)
Kriner, J. J.—Chambersburg, Pa. (Jewel.)
Kroner, J. C.—1433 Main St., La Crosse, Wis. (Maxwell.)
Kronmeyer, Wm.—Murphysboro, Ill. (Pope-Hartford.)
Krueger Auto Co.—Milwaukee, Wis. (Premier.)
Krueger Automobile Co.—233 Main St., Oshkosh, Wis. (Buick, Winton, Pope-Hartford.)
Kruger Auto Co.—Lawrence St., Appleton, Wis. (Winton, Pope-Hartford.)
o Co., A. L.—1677 Broadway, (Dragon, Wayne.)
au, H. T.—Tonopah, Nev. (Is-Fraschini, Simplex, Thomas, Olds-garage: repairing.

L.

p. Co.—1964 Broadway, New York. (De La Buire.)
awana Motor Car Co.—Scranton, (Winton.)

Lacon Auto Co.—Lacon, Ill. (National.)
La Crosse Motor Car Co.—127 N. 3rd St., La Crosse, Wis. (Mitchell, Cadillac.)
Lacy, E. L.—Pittman, N. J. (Ford.)
La France Auto Repair & Supply Co.—Florence St., Marlboro, Mass. (Maxwell.)
La France Motor Car Co.—451 E. Market St. Elmira, N. Y. (Corbin.)
La Grange, J. W.—Franklin, Ind. (National.)
Laing Machine Auto & Repair Co.—416 Sycamore St., Plainfield, N. J. (Cadillac, Haynes, Waltham.)
Lakdel Automobile Co.—5143 Delmar Ave., St. Louis, Mo. (Wayne, De Luxe.)
Lamb Auto Co.—207-9 6th Ave., Clinton, Ia. (Peerless, American Mercedes.)
Lambert, E. A.—Titusville, Pa. (Pierce-Arrow, Stevens-Duryea, Buick.)
Lambert Agency, Pacific Garage.—1225-1227 W. Washington St., Los Angeles, Cal. (Lambert.)
Lambert Auto Co.—343 Golden Gate Ave., San Francisco, Cal. (Lambert.)
Lamy, Nap.—Three Rivers, Quebec, Canada. (Maxwell.)
Lancaster Automobile Co.—215 North Broad St., Lancaster, Pa. (Buick, Pope-Toledo, Pope-Waverley, Winton.)
Landen, J. C.—Jackson, Miss. (Cadillac.)
Landis, Samuel K.—122 E. Chestnut St., Lancaster, Pa. (Logan, Reo, Jackson, Premier.)
Lane Motor Vehicle Co.—Prospect St., Poughkeepsie, N. Y. (Lane.)
Lane, O. W.—117 Grand St., Lansing, Mich. (Ford.)
Lane Sales Co.—514 W. 145th St., New York City. (Lane.)
Langhorne Transportation Co.—Langhorne, Pa. (Elmore, Knox, Reo.)
Lanhan, Geo. W.—Greenburg, Ind. (Ford, Maxwell.)
Lanich, Arthur S.—Baraboo, Wis. (Gale.)
Lansden Co.—54 Lackawanna Ave., Newark, N. J. (Lansden.)
Lanza Donato & L. La Paz.—Bolivia, South America. (Wayne.)
Lapeer City Garage.—Lapeer, Mich. (Ford.)
Lappe, J. H.—Sabina, O. (Jewel.)
La Porte, V. E.—1729 19th St., Bakersfield, Cal. (Jewel.)
Laramie Cycle & Garage Co.—314 2nd St., Laramie, Wyo. (Maxwell.)
Larsen, J. M.—Omaha, Neb. (Acme.)
Larzalere Machine Co.—225 Maynard St., Williamsport, Pa. (Maxwell.)
Latham, C. H.—Norwich, N. Y. (Buick.)
Latham.—Schenectady, N. Y. (Ford, Corbin.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Latta, M.**—Akron, O. (Jewel.)
- Laugenour, Henry.**—625 Ashbury St., San Francisco, Cal. (Dolson.)
- Lawler, R. B.**—Clarksdale, Miss. (Winton.)
- Lawrence Motor Car Co.**—13-17 W. Warren St., Lawrence, Kan. (Ford); garage; repairing.
- Lawson Garage.**—810 South St., Peekskill, N. Y. (Cadillac, Pope-Hartford, Pope-Toledo.) Supplies; garage; repairing.
- Layton, C. G.**—Potomac, Ill. (Rambler, Lambert.)
- Layton, C. G.**—Danville, Ill. (North-ern.)
- Layton, W. C.**—Spartansburg, S. C. (Waltham.)
- Leach, A. R.**—580 Lake Ave., Rochester, N. Y. (Queen, De Luxe.)
- Leach, Ed. E.**—Franklin, Pa. (Hols-man.)
- Leach, E. W.**—Franklin Falls, N. H. (Pope-Hartford.)
- Leader & Sons, C. C.**—9th & Independent St., Shamokin, Pa. (Maxwell.)
- League Cycle Store.**—325 Southwest Temple St., Salt Lake City, Utah. (Indian.)
- Lear Auto Co., Oscar.**—Broadway and 62nd St., New York City. (Fray-er-Miller.)
- Leas, J. & J.**—West Manchester, Ohio. (Premier.)
- Leavitt & Co.**—Oakland, Cal. (Reo, Cleveland.)
- Leavitt & Co., J. W.**—441 Golden Gate Ave., San Francisco, Cal. (Cleveland, Reo, Stoddard-Dayton.)
- Leavitt, Wm. C.**—Norway, Me. (Cadil-lac.)
- Lebanon Motor Works.**—12th & Walnut Sts., Lebanon, Pa. (Upton.)
- Le Bron, A. W.**—Montgomery, Ala. (Maxwell.)
- Lee, Arthur S.**—52 Richmond St., Provi-dence, R. I. (Royal.)
- Lee Motor Car Co.**—1218 S. Main St., Los Angeles, Cal. (Cadillac.)
- Lehan, James.**—Stoughton, Mass. (Pope-Hartford.)
- Lehigh Valley Auto Co.**—46 Broad St., Bethlehem, Pa. (Lambert.)
- Lejeal Cycle & Mobile Works.**—17 Sassafrass St., Erie, Pa. (Indian.)
- Lemoigue & O'Beirne.**—1735 Grand Ave., Kansas City, Mo. (Panhard.)
- Lemont Motor Car Co.**—6 Turrell St., Worcester, Mass. (Buick.)
- Lenz Land & Loan Co.**—Jamestown, N. Dak. (Buick.)
- Leonard Motor Car Co.**—Cleveland, O. (Jackson.)
- Le Roy Transfer & Storage Co.**—Le Roy, N. Y. (Holsman.)
- Lesser, Julius.**—St. Louis, Mo. (Rainier.)
- Levenhager Auto & Garage Co.**—War-saw, Wis. (Rambler.)
- Leverenz, E. B.**—930 3rd St., Milwaukee, Wis. (Cameron.)
- Levy & Fanning Co.**—390 Wabash Ave., Chicago, Ill. (Autocar, Lozier.)
- Lewis & Son., J. A.**—Mankato, Minn. (Cadillac.)
- Lewis, H. H.**—Fort Worth, Tex. (Rainier.)
- Lewis, John C.**—3033 Monroe St., To-ledo, Ohio. (Indian.)
- Lewis, John G.**—Buffalo, N. Y. (Ameri-can.)
- Lewis, L. D.**—Seattle, Wash. (Fray-er-Miller.)
- Lewis, S. H.**—Binghamton, N. Y. (Max-well.)
- Lewis, T. S.**—509 Chestnut St., St. Louis, Mo. (Logan.)
- Lewistown Motor Car Co.**—Lewistown, Pa. (Pullman.)
- Leyford Bros.**—625 E. Washington Ave., Bridgeport, Conn. (Oldsmobile.)
- Libbey, Frank P.**—Salt Lake City, Utah. (Lozier.)
- Liberty Auto Co.**—138 Beatty St., E. E. Pittsburg, Pa. (Wayne, National, Mitchell, Mora.)
- Lima Auto Co.**—Lima, O. (Jackson.)
- Lincoln Auto Garage.**—Lincoln, Neb. (Winton, Maxwell.)
- Lichtie Auto Co.**—818 Jefferson Ave., Toledo, Ohio. (Cadillac.)
- Lindinier, P. F.**—1164 W. Lake St., Chicago, Ill. (Glide.)
- Linkroum Smelser Automobile Co.**—17 Bank St., Newark, N. J. (Lozier.)
- Linscott Motor Co.**—163 Columbus Ave., Boston, Mass. (Wayne, National, Reo.)
- Linton, C. M.**—173 N. Bend St., Paw-tucket, R. I. (Jackson.)
- Linton, C. M.**—103 Washington Ave., Providence, R. I. (Jackson.)
- Lintot, H. C.**—45 Main St., Nashua, N. H. (Reo.)
- Linz-Sanborn Automobile Co.**—505 Golden Gate Ave., San Francisco, Cal. (Maxwell.)
- Lippincott, Z.**—Long Branch, N. J. (Waltham.)
- Lisk & Petry.**—405-7 Diamond St., Hud-son, N. Y. (Stevens-Duryea, Cadillac, Thomas); garage; repairing; supplies.
- Little Rock Auto Co.**—211 W 2nd St Little Rock, Ark. (B)
- Livesey-Pioneer Motor**
11th St., Newark, N. J.
- Locher & Robb.**—315 S. Bu-amazoo, Mich. (Frankli)
- Lock Haven Auto Co.**—Conn. (Pope-Toledo, Fra)
- Lockwood & Co., F. E.**—39 Norwalk, Conn. (Locomol-tham, Autocar, Elmore. Wh-age, repairs, supplies.

AUTOMOBILE AGENTS AND DEALERS (Continued)

Lockwood Bros.—103-109 Pearl St., W. Jackson, Mich. (Pope-Toledo); garage; supplies.
Lockwood, Carl J.—Washington, D. C. (Stanley.)
Lockwood, E.—104 2nd St., Laramie, Wyo. (Mora, Cartercar, Smith.)
Locomobile Co.—400 Newbury St., Boston, Mass. (Locomobile.) Garage; repairing.
Locomobile Co. of America.—Broadway and 76th St., New York City. (Locomobile.)
Locomobile Co. of America.—1354 Michigan Ave., Chicago, Ill. (Locomobile.)
Locomobile Co. of America.—Seaside Park, Bridgeport, Conn. (Locomobile.)
Locomobile Co. of America.—249 N. Broad St., Philadelphia, Pa. (Locomobile.)
Logan, Ernest C.—White Plains, N. Y. (Maxwell.)
Logansport Auto Co.—Broadway near 6th St., Logansport, Ind. (Haynes.)
Lombard Iron Works & Supply Co.—Augusta, Ga. (Waltham.)
Lombardi Motor Co.—71 Minerva St., Derby, Conn. (Oldsmobile.)
Lomer, Louis L.—Care U. S. Legation, Buenos Ayres, Argentine Republic. South America. (Oldsmobile.)
Long Beach Auto Co.—Long Beach, Cal. (Pope-Waverley, Royal, Maxwell, Columbia.)
Long Branch Auto Co.—Long Branch, N. J. (Matheson.)
Longest Bros.—821 3rd Ave., Louisville, Ky. (Stoddard-Dayton, White, Ford, Maxwell.)
Lonk & Compton.—1808 Farnan St., Omaha, Neb. (Maxwell.)
Lonk, Chas. F.—Council Bluffs, Iowa. (Maxwell.)
Lonk, Chas. F.—Jefferson, Iowa. (Maxwell.)
Lopez, German.—Havana, Cuba. (Locomobile.)
Lorain Automobile Co.—Lorain, Ohio. (Elmore.)
Lorge & Welch.—Miniot, N. Dak. (Cadillac.)
Lord, Dr. L. W.—West Ossipee, N. H. (Maxwell.)
Lord Motor Car Co.—1044 S. Main St., Los Angeles, Cal. (Cleveland, Kisselkar, Mason, Woods.)
Loring Motor Car Co.—Brockton, Mass. (Maxwell.)
Louck & Boehme.—Kalona, Iowa. (Moline.)
Lovatt, J. M.—Bethlehem, Pa. (Haynes.)
Lovell, C. D. S.—Lynn, Mass. (Holsman.)

Loving, Elmer.—638 N. Main St., Brockton, Mass. (Maxwell.)
Lowe, Geo. H. Co.—509 Tremont St., Boston, Mass. (American Mors.)
Lowell Automobile Co.—Appleton St., & Post Office Ave., Lowell, Mass. (Stevens-Duryea, Cadillac, Pope-Hartford, Stanley); garage; repairing; supplies.
Lowe, Phillip A.—Pittsfield, Mass. (Stoddard-Dayton.)
Lowe, S. C. Garage.—22 4th St., New Bedford, Mass. (Locomobile, Oldsmobile, Franklin); garage; repairing.
Loyd, Dr. O. H.—Hereford, Tex. (Holsman.)
Lozier Motor Co.—55th St. & Broadway, New York. (Lozier.)
Lozier Automobile Agency.—132 Valencia St., San Francisco, Cal. (Lozier.)
Lubeck Automobile Co.—148 N. Ionia St., Grand Rapids, Mich. (Locomobile, Oldsmobile.)
Lubbock Motor Car Co.—Lubbock, Tex. (Jackson.)
Lucas Co., W. P.—255 Elm St., Oil City, Pa. (Thomas, Haynes, Pope-Hartford.)
Luce & Banks Co.—87 Division St., Grand Rapids, Mich. (Maxwell.)
Lucey Motor Car Co.—231 River St., Troy, N. Y. (Stoddard-Dayton); garage.
Lucia Cycle Co.—Green Bay, Wis. (Pope-Toledo, Pope-Hartford, Waltham.)
Lundy, C. A.—Reno, Nev. (Pope-Toledo, Franklin, Dorris.)
Lundy-Fulton Auto Co.—Bottineau, N. Dak. (Ford, Cameron, Mitchell.)
Lutia, L. I.—239 Jefferson Ave., Detroit, Mich. (Merkel.)
Luttrell Co.—1711 14th St., N. W., Washington, D. C. (Buick.)
Lutz Co., Wm. F.—Santa Anna, Cal. (Buick); repairing.
Lydon, A. S.—Ann Arbor, Mich. (Dragon.)
Lyell & Co., J. M.—Farnham, Vt. (Holsman.)
Lynch Auto Co., A. S.—Independence, Iowa. (Waltham.)
Lynch Co., Frank.—Fargo, N. Dak. (Cadillac, Pope-Waverley.)
Lynn Auto Co.—Lynn, Mass. (Queen.)
Lyon, Geo. L.—Main & Chapel Sts., Durham, N. C. (Reo, Premier.)
Lyons & Co.—Grand Forks, N. Dak. (Indian, Cadillac, Franklin.)
Lyons, John P.—Bellefonte, Pa. (Cadillac.)

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Mabbet, F. A.—191 Main St., Rochester, N. Y. (Cadillac, Oldsmobile.)
MacFarland-Powell Auto Co.—1618 Glenarm St., Denver, Colo. (Pope-Hartford.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Machine Electric Supply Co.—117 Mulberry St., Muncie, Ind. (Mitchell, Maxwell, National.)

MacKay, Heinen & Co.—San Antonio Texas. (Holsman.)

Mack Bros. Mfg. Co.—540 Atlantic Ave., Brooklyn, N. Y. (Manhattan.)

Mack, H. A.—206 E. Market St., Lima, Ohio. (Buick, Cadillac, Franklin.)

MacNish Auto Co.—3667 Olive St., St. Louis, Mo. (Queen, Ford, National, Rambler.)

Madison Automobile Garage.—116 S. Pinckney St., Madison, Wis. (Ford, Reo.)

Magee, G. M.—Huron, S. Dak. (Buick.)

Magna Garage.—Holyoke, Mass. (Buick, Stevens-Duryea.)

Magoon Motor Co., R. H.—2174-80 9th St., S. E., Cleveland, Ohio. (Pope-Toledo); garage; repairs; supplies.

Magraw, W. M. F.—249 -51 N. Broad St. Philadelphia, Pa. (Autocar.)

Maklke Machine & Mould Works, R. A.—15th St., Wheeling, W. Va. (Pope-Hartford.)

Maine Motor Carriage Co.—Free & South Sts., Portland, Me. (Haynes, Pope-Hartford, Stevens-Duryea); garage; repairs; supplies.

Maja Co., Ltd., American Branch.—230 W. 58th St., New York City. (Maja.)

Mallory Bros. & Steward.—Parkersburg, W. Va. (White.)

Maltby, W. S.—Plainfield, N. J. (Corbin.)

Manchester Auto Co.—Main St., Manchester, Iowa. (Jackson, Buick, Northern, Cadillac, Pope-Waverley, Reo, Columbia, Franklin.)

Manchester Auto Garage.—50 Granite St., Manchester, N. H. (Buick, Columbia, Oldsmobile.)

Manchester Auto Garage.—61 N. Main St., Manchester, Conn. (Lambert.)

Mandery, J. J.—150 South Ave., Rochester, N. Y. (Columbia.)

Manhattan Motor Car Co.—329 Michigan Ave., Chicago, Ill. (Acme.)

Manley Bros.—Harvard, Ill. (Queen, National.)

Manley Bros.—Rear Brooks House, Brattleboro, Vt. (Ford, Rambler, Jackson.)

Mann, W. F.—Yonkers, N. Y. (Waltham.)

Manning, A. C.—Interlaken, N. Y. (Holsman.)

Manning, E. J.—Munroe, Wis. (Holsman.)

Mansfield Auto & Supply Co., The.—64 N. Walnut St., Mansfield, O. (Buick, Cadillac.)

Mansfield & Son, W. H.—Koleen, Ind. (National.)

Mansfield & Son, W. H.—Bloomfield, Ind. (Maxwell.)

Manuel Bros.—Richford, Vt. (Elmore, Cadillac.)

Manuel, G. M.—Edmonton, Alberta, Canada. (Buick.)

Marble, W. H. Auto Garage.—69 Main St., Brockton, Mass. (Columbia, Locomobile, Cadillac, Knox, Winton); garage; repairs; supplies.

March, A. A.—904 Benton Blvd. Kansas City, Mo. (Holsman.)

Mar-Del Mobile Co.—Charles St. & Mt. Royal Ave., Baltimore, Md. (Packard, Franklin, Cadillac, Pope-Waverley, Gallia, Northern, Elmore.)

Marine Iron Works.—Beaumont, Tex. (Maxwell.)

Marine Supply Co.—San Pedro, Cal. (Reo.)

Marion Auto Co.—Marion, O. (Ford, Maxwell, Mora, Reo, Rambler.)

Marion, J. Q.—El Paso, Tex. (Waltham, Reading-Standard.)

Mark, Davis.—Ravenna, Ohio. (Reo.)

Martin & Co., H. G.—179 Aborn St., Providence, R. I. (Rapid.)

Martin & Son, C. Y.—209 Main St., Santa Anna, Cal. (Maxwell, Ford, Modeline.)

Martin Auto Co.—Hutchinson, Kan. (Northern.)

Martin Automobile Co., F. L. C.—320-4 Park Ave., Plainfield, N. J. Franklin, Mercedes, Clement-Bayard, Stevens-Duryea); garage; repairing.

Martin, C. F.—Bellefontaine, Ohio. (Northern, Cadillac.)

Martin, C. H.—29 W. 42d St., New York City. (Atlas runabout.)

Martin Dunning Auto Garage Co.—538 E. 18th St., Paterson, N. J. (Pullman, Crawford.)

Martin, Fred. K.—Perth Amboy, N. J. (Monarch.)

Martin, Jos.—Peekskill, N. Y. (Maxwell.)

Martin, L. G.—3923 Forbes St., Pittsburgh, Pa. (Rambler.)

Martin Co., Walter.—Broadway and 62nd St., New York City, and 1001 Bedford Ave., Brooklyn, N. Y. (Rolls-Royce.)

Martin W. E.—Goepf St., Bethlehem, Pa. (Knox.)

Martin's Garage.—Long Branch, N. J. (Cadillac.)

Martini Import Co.—239 W. 50 New York City. (Martini.)

Martland Automobile Co.—15 San Francisco, Cal. (Glide)

Maryland Auto Co.—Lafayette rollton Ave., Baltimore, Md. (Calvert.)

Mason & Co., C. V.—Bristol, (Autocar.)

Mason & Somers, W. R.—822 Victo Bldg., St. Louis, Mo. (Columbus.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Mason Automobile Exchange.—163 Broadway, New York City. (Franklin.)

Mason's Carriage Works.—Davenport, Iowa. (Winton, Cadillac, Northern, Thomas Flyer, Pope-Waverley.)

Mason Car Sales Co.—3130 Main St., Kansas City, Mo. (Mason.)

Mason, C. S.—Sumter, S. C. (Cadillac.)

Mason, Ernest.—Malone, N. Y. (Reo.)

Mason, Jacob W.—283-285 Halsey St., Newark, N. J. (Maxwell.)

Massey Auto & Bicycle Co., W. J.—Vancouver, B. C. (Rapid, Rambler.)

Massillon Fotor Car Co.—76 S. Erie St., Massillon, O. (Ford.)

Matheny, Geo. H.—Sarasota, Fla. (Waltham.)

Matheson Agency.—Pittsburg, Pa. (Berliet, Matheson.)

Matheson Auto Co.—1624 Broadway, Denver, Colo. (Columbia, Thomas Flyer, Oldsmobile, Woods.)

Matheson Co. of New England.—92 Massachusetts Ave., Boston, Mass. (Matheson.)

Matheson Co. of California.—Golden Gate Ave., San Francisco, Cal. (Matheson.)

Matheson Co. of Maryland.—Continental Bldg., Baltimore, Md. (Matheson.)

Matheson Co. of New Jersey.—9 Clinton St., Newark, N. J. (Matheson.)

Matheson Co. of New Jersey.—147-151 Main Ave., Passaic, N. J. (Matheson.)

Matheson Motor Car Co.—Wilkesbarre, Pa. (Matheson.)

Mathews Auto Co., C. S.—514-16 Jackson St., Topeka, Kan. (Ford.)

Mathias, C. W.—Arkansas & Arctic Aves., Atlantic City, N. J. (Cadillac.)

Maughan, John W.—Care Spaulding Cotton Mills, Griffin, Ga. (Maxwell.)

Mauvais Motor Car Co.—489 Golden Gate Ave., San Francisco, Cal. (Heine Velox.)

Maw & Co., Jos.—Market St., Winnipeg, Canada. (Rapid, Franklin, Oldsmobile, Reo.)

Maxfield & Rice Bros.—1401 Hennepin Ave., Minneapolis, Minn. (Haynes.)

Maxim, C. W.—Middleboro, Mass. (Autocar.)

Maxwell, M. W.—Market Square, Paris, (Waltham.)

Motor Car Co.—13 Dorrance St., Providence, R. I. (Maxwell.)

Maxwell Agency.—Columbus, Ohio. (Maxwell.)

Maxwell Auto Agency.—Manchester, (Maxwell.)

Maxwell-Briscoe-Boston Co.—121 Massachusetts Ave., Boston, Mass. (Maxwell.)

Maxwell-Briscoe Buffalo Co.—26-8 Goodrich St., Buffalo, N. Y. (Maxwell, Mora.)

Maxwell-Briscoe-Chase Co.—1407 Michigan Ave., Chicago, Ill. (Maxwell.)

Maxwell-Briscoe-Chase Co.—3968 Olive St., St. Louis, Mo. (Maxwell.)

Maxwell-Briscoe, Inc.—317 W. 59 St., New York, N. Y. (Maxwell.)

Maxwell-Briscoe-McLeod Co.—243 Jefferson Ave., Detroit, Mich. (Maxwell, Mitchell.)

Maxwell-Briscoe-Willcox Co.—1211 S. Main St., Los Angeles, Cal. (Maxwell.)

Marshall House.—York, Me. (Reo, Premier.)

Mayer, J. H.—Beatrice, Neb. (Holsman.)

Mayer Rudolph.—151 Main St., Springfield, Mass. (Autocar.)

Maynard, W. A.—68 Gilbert St., New Haven, Conn. (Thomas Flyer, Autocar.)

McArthur & Son, John.—Aberdeen, S. Dak. (Rambler.)

McBride Bros.—River St., Elgin, Ill. (Reo.)

McBride, Dr.—Rugby, N. Dak. (Mitchell.)

McBurnie Auto Co.—Broadway & Jackson St., Louisville, Ky. (Kissellkar.)

McCan, Dr. W.—391 S. Main St., Geneva, N. Y. (Franklin.)

McCartin, Geo. S.—Watertown, N. Y. (Thomas.)

McClary, A. G.—Defiance, O. (Reo.)

McClatchy, Meade.—73 E. Side St., Canton, Ill. (Rapid.)

McClay, James.—183 Grand Ave., New Haven, Conn. (Elmore.)

McClure, A. W.—Ann Arbor, Mich. (Maxwell.)

McClure, Don P.—Oskakoosha and Ottumwa, Iowa. (Buick, Pope-Hartford, Pope-Waverley, Columbia, Winton, Maxwell.)

McClure, F. A.—205 S. Cayuga St., Ithaca, N. Y. (Cadillac, Franklin.)

McCollum, Dr. H. E.—2nd St., Laramie, Wyo. (Lambert.)

McCook Auto Co.—McCook, Neb. (Mason, Holsman, Waltham.)

McCord, Don C.—408 Golden Gate Ave., San Francisco, Cal. (American Mercedes.)

McCormac, P. A.—Rowland, N. C. (Waltham.)

McCoy, Fred V.—23 East St., Fort Edward, N. Y. (Maxwell.)

McCoy, Geo. A.—Riverside, N. J. (Cadillac.)

McCray, James E.—Wapello, Ia. (Holsman.)

McCraw, G. P.—Pierson, Iowa. (Cadillac, Northern.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- McCreery & Sons.**—1625 6th Ave., Beaver Falls, Pa. (Gale, Reo.)
- McCulloch & Boswell.**—Ellice & Hargrave Sts., Winnipeg, Manitoba, Canada. (Buick, Royal.)
- McCurdy, Dr.**—Coaticook, Quebec, Canada. (Maxwell.)
- McDaniel, Leo.**—Cairo, Ill. (Premier.)
- McDaniels, S. C.**—Laurens, S. C. (Waltham.)
- McDonald Auto Co.**—Memphis, Tenn. (Holsman, Mitchell.)
- McDonald, D. L.**—Van Wert, Ohio. Winton, Cadillac.)
- McDonald, Ed.**—Taunton, Mass. (Reo.)
- McDonald, Titus & Co.**—61 E. Spring St., Columbus, Ohio. (Reo, Mora.)
- McDougal, Natt.**—Missoula, Mont. (Buick.)
- McDuffee Automobile Co.**—1501 Michigan Ave., Chicago, Ill. (De Luxe, Stoddard-Dayton, Kisselkar.)
- McDuffee Automobile Co.**—228-232 Wisconsin St., Milwaukee, Wis. (De Luxe, Stoddard-Dayton, Kisselkar.)
- McElroy, D. W.**—408-10 Market St., San Antonio, Tex. (De Luxe, Stoddard-Dayton.)
- McFadden, V. B. & Son.**—Rock Hill, S. C. (Maxwell, Waltham.)
- McFieran, J. C.**—1043 3rd Ave., Louisville, Ky. (Pope-Toledo, Pope-Hartford.)
- McGiffert, James.**—Ashtabula, O. (Reo.)
- McGowan, J. Harry.**—Cincinnati, Ohio. (Haynes.)
- McGranagan, P. J.**—121 Jackson St., Sandusky, Ohio. (Ford.)
- McGuire & Co., T. D.**—Cincinnati, Ohio. (Cartercar.)
- McGuire Co., J. W.**—745 Boylston St., Boston, Mass. (Pierce Arrow.)
- McIntyre, F. E.**—Pine Ridge, S. Dak. (Waltham.)
- McIntyre, Geo. B.**—1221 State St., Erie, Pa. (Cartercar.)
- McIrwin & Walker.**—Atwood, Kan. (Jewel.)
- McKee, Sam. L.**—Segerin, Tex. (Waltham.)
- McKeen, J. D.**—Morris, Ill. (National.)
- McKenzie, A.**—Smith's Falls, Ontario, Canada. (Maxwell.)
- McLaughlin, W. A.**—Zanesville, Ohio. (Jewel.)
- McLean Automobile Co.**—1604 Broadway, New York, N. Y. (Lambert.)
- McLeary Co., F. E.**—51-53 Main St., Farmington, Me. (Rambler, Ford.)
- McLeod, A. J.**—Rowland, N. Y. (Cadillac.)
- McLeod, F. N.**—Florence, S. C. (Cadillac.)
- McMaster, S. R.**—Columbia, S. C. (Pope-Hartford.)
- McNall, Arthur.**—East Ave. & S. Union St., Rochester, N. Y. (Peerless, Franklin, Rauch Lang.)
- McMary Co., J. E.**—1606 Machesnay Bldg., Pittsburg, Pa. (Studebaker.)
- McNamara, Lewis P.**—48th St. & Broadway, New York. (Renault.)
- McNaughton, J. F.**—1126 S. Main St., Los Angeles, Cal. (Dolson, Mora.)
- McPherson, A. M.**—Santa Monica, Cal. (Reo.)
- McRae, F. W.**—Atlanta, Ga. (Atlas.)
- Mears, J. W.**—7 Ocean Parkway, Brooklyn, N. Y. (Acme.)
- Mechaley Auto Co.**—30-40 Summer St., Stamford, Conn. (Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, Cadillac, White); garage; repairing; supplies.
- Mechanical Supply Co.**—Mission Point Bldg., Marinette, Wis. (Rambler, Maxwell, Rapid.)
- Mecum, I. E. & E. H.**—Orland, Cal. (Holsman.)
- Medina Stamping & Machine Co.**—Church St., Medina, N. Y. (Winton, Cadillac, Oldsmobile, Autocar, Pope-Toledo.)
- Meeks, Dr. H. A.**—88 East Main St., Meridan, Conn. (Stevens-Duryea, Pope-Hartford.)
- Megargel, Ralph G.**—913 Olive St., Scranton, Pa. (Elmore.)
- Meguire, Dr. T. D.**—3907 Borden St., Cincinnati, Ohio. (Cartercar.)
- Mehlig, J.**—113 St. Charles St., New Orleans, La. (Knox.)
- Memphis Auto Co.**—Memphis, Tenn. (Thomas Flyer.)
- Menominee River Auto Co.**—418 Main St., Menominee, Mich. (Reo, Premier, Queen, Ford.)
- Mentel's Auto Agency.**—Springfield, O. (Jackson.)
- Mercedes Import Co.**—Boston, Mass. (Mercedes.)
- Mercedes Import Co.**—1449 Mich Ave., Chicago, Ill. (Mercedes.)
- Mercedes Import Co.**—590 5th Ave., New York, N. Y. (Mercedes.)
- Mercedes Import Co.**—153 N. Broad St., Philadelphia, Pa. (Mercedes.)
- Mercedes Import**—Newport, R. I. (Mercedes.)
- Mercer, W.**—Pala, Cal. (Maxwell.)
- Merchant, B. J.**—Cal. (Pope-Hartford, Hewitt); garage; repair
- Meredith, J. L.**—Elburns, I
- Merritt & Simpson.**—35 Ar Newark, N. J. (Waltham
- Methoen, D. C.**—Salina, Ieron.)
- Metropolitan Automobile** Stanhope St., Boston, Mass. (garage; repairs.

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Metropolitan Automobile Co.**—1841 Euclid Ave., Cleveland, Ohio. (Babcock, Pierce Arrow, Stearns, Cadillac.)
- Metropolitan Motor Car Co.**—E. 19th St. and Euclid Ave., Cleveland, O. (Stearns, Pierce Arrow, Cadillac.)
- Mettowee Valley Auto Agency.**—Granville, N. Y. (Cadillac.)
- Metzger, Wm. E.**—252 Woodward Ave., Detroit, Mich. (Indian.)
- Meyer, R.**—151 Main St., Springfield, Mass. (Lambert.)
- Meyers, Chas. S.**—318 Cherry St., Columbia, Pa. (Rambler.)
- Meyers, J. P.**—500 St. George St., York, Pa. (Rambler.)
- Miami Automobile Co.**—13th St., bet. Ave. D and E. (Locomobile, Reo); garage; repairing.
- Miami Motor Car Co.**—117 E. 2nd St., Dayton, Ohio. (Franklin, Haynes, Waltham); garage; repairing.
- Michaelis-Middlehauff Auto Co.**—1650-52-54 Glenarm St., Denver, Colo. (Queen); garage; repairing.
- Michigan Auto & Supply Co.**—Menominee, Mich. (Holsman.)
- Middleboro Auto Exchange.**—Wareham St., Middleboro, Mass. (Autocar.)
- Middlesex Motor Car Co.**—George St. & Carroll Pl., New Brunswick, N. J. (Indian, Pope-Hartford.)
- Middleton, A. C.**—447 Corteret St., Camden, N. J. (Rambler.)
- Middleton Motor Car Co.**—550 Golden Gate Ave., San Francisco, Cal. (Corbin, Columbus, Autocar.)
- Middleton Motor Car Co.**—1032 S. Main St., Los Angeles, Cal. (Columbia.)
- Middletown Auto Co.**—10 Henry St., Middletown, N. Y. (Maxwell.)
- Midland Motor Car Co.**—1116 E. 15th St., Kansas City, Mo. (Peerless.)
- Migliavacca Co.**—208 S. 2nd Ave., Seattle, Wash. (Glide, Earl.)
- Miles, E. J.**—Newton, Iowa. (Holsman.)
- Milford Automobile Machine Co.**—171 Main St., Milford, Mass. (Maxwell.)
- Miller & Bros., Chas. E.**—1105 14th St., N. W., Washington, D. C. (Ford, Reo, Premier.)
- Miller & Wilson Auto Co.**—Colorado Springs, Colo. (Waltham.)
—12 Maple St. and 7 Bay St., ls, N. Y. (Buick); garage; supplies.
- Murray Co.**—Murray, Utah. (Hartford, Knox.)
- D., Dr.**—Poughkeepsie, N. Y.

H.—Canal Dover, Ohio.

E. H.—Fort Wayne, Ind. (Pope-Hartford.)

- Miller, E. H.**—Elkhart, Ind. (Pope-Hartford.)
- Miller, F. J.**—Lake Ave. & 3rd St., Racine, Wis. (Winton, Cadillac.)
- Miller, Geo. H.**—275 S. Garey Ave., Pomona, Cal. (Ford, Royal, Pope-Waverley.)
- Miller, Sol.**—Newport News, Va. (Jackson.)
- Miller Sons Carriage Co., Geo. C.**—713 Main St., Cincinnati, Ohio. (Stevens-Duryea, Isotta.)
- Miller, Wm.**—Thomasville, Ga. (Holsman.)
- Mills & Peterson.**—Akron, N. Y. (Lambert.)
- Miller's Garage Co.**—558 Fairfield Ave., Bridgeport, Conn. (Glide, Maxwell); supplies; repairing.
- Mills Auto & Bicycle Co.**—Newark, O. (Cadillac, Jewel.)
- Mills-Kennedy Co.**—733 Boylston St., Boston, Mass. (Springfield, Welch.)
- Milne, W. S.**—Cleveland, Tenn. (Pope-Waverley.)
- Minchin, C. H.**—157 Greenwich Ave., Greenwich, Conn. (Waltham.)
- Minchin, C. H.**—Port Chester, N. Y. (Waltham.)
- Miner Co., Geo. L. S.**—Clinton Ave., cor. Court St., Rochester, N. Y. (Indian.)
- Miner, F. G.**—San Francisco, Cal. (Fiat.)
- Miner Garage Co.**—Cor. High & Allyn Sts., Hartford, Conn. (Buick, Pierce Arrow, Knox, Pope-Waverley, Haynes.)
- Minneapolis Automobile Co.**—830 Hennepin Ave., Minneapolis, Minn. (Auburn, Austin.)
- Mintie & Benedict.**—21 Buckingham St., Waterbury, Conn. (Pope-Waverley, Stevens-Duryea.)
- Mironda Motor Car Co.**—1012 N. Grand Ave., St. Louis, Mo. (Lozier, Knox.)
- Mississippi Valley Auto Co.**—5023 Delmar Blvd., St. Louis, Mo. (Couple-Gear, Elmore, Pope-Toledo, Pope-Hartford, Pope-Waverley, Mercedes, Wood, Peerless); electric charging; repair shop.
- Missouri Valley Auto Co.**—1112-1114 E. 15th St. & Troost Ave., Kansas City, Mo. (White); garage; repairing.
- Mitchell Agency.**—380 S. Los Angeles St., Los Angeles, Cal. (Marvel.)
- Mitchell, Agency of Bridgeport.**—111 Meigs Bldg., Bridgeport, Conn. (Mitchell.)
- Mitchell, A. D.**—Helena, Mont. (Mitchell.)
- Mitchell Auto Co.**—1466 Michigan Ave., Chicago, Ill. (Mitchell.)
- Mitchell Auto Co., F. F.**—St. Joseph, Mo. (Glide.)
- Mitchell Garage.**—1028 Connecticut Ave., Washington, D. C. (Mitchell.)
- Mitchell, Lewis & Staver Co.**—Portland, Ore. (Mitchell.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Mitchell Motor Car Co.—Paris, France. (Mitchell.)
Mitchell Motor Co. of New York.—1876 Broadway, New York City. (Mitchell.)
Mobile Auto Co.—Mobile, Ala. (Stoddard-Dayton.)
Mobile Carriage Co.—762 Golden Gate Ave., San Francisco, Cal. (Pierce Arrow, Knox.)
Model Machine Works.—E. Clinton St., Frankford, Ind. (Holsman.)
Moe, B. P.—Watertown, S. Dak. (Rambler.)
Mogenety, B. F.—Shreveport, La. (Cadillac.)
Mohawk Valley Auto Co.—Albany, N. Y. (Knox.)
Mohler & De Gress.—la Independencia 12, Mexico City, Mex. (Rapid, Thomas Flyer, Monarch, Dragon, Pierce Arrow, Stevens-Duryea.)
Momot & Sacher.—S. Market St., Canton, Ohio. (Rambler.)
Moise, E. W., Jr.—Sumter, S. C.—(Buick.)
Moliner, M. & J.—Buenos Ayres, S. A. (Holsman.)
Mongollon Motor Road Co.—Silver City, N. M. (Reo.)
Monnich, Bernard.—Dodge County Bank Bldg., Hooper, Neb. (Holsman.)
Monroe, John B.—Powellton, Ill. (Waltham.)
Montana Garage Co.—Butte, Mont. (Glide.)
Monte Cristo Garage.—New London, Conn. (Pullman.)
Montgomery Auto Co.—Montgomery, Ala. (Cadillac.)
Montgomery, H. C.—Shelbyville, Ind. (Haynes.)
Montonz, E.—Riverhead, Long Island, N. Y. (Maxwell.)
Monumental Garage, The.—1002 Morton St., Baltimore, Md. (Pungs-Finch; Maxwell); garage; repairing.
Moody, C. F.—Devil's Lake, N. Dak. (Buick.)
Moon Automobile Co.—461 Golden Gate Ave., San Francisco, Cal. (Moon.)
Moon, C. D.—Eau Claire, Wis. (Franklin.)
Moore, Babcock.—429 Wabash Ave., Chicago, Ill. (Reliance.)
Moore Auto Co.—Lincoln, Neb. (Monarch.)
Moore Auto Co.—571 Fifth Ave., New York City. (Moore.)
Moore Automobile Co.—Walla Walla, Wash. (Franklin.)
Moore, Edenfield Elec. & Mfg. Co.—1033 Broad St., Augusta, Ga. (Franklin, Cadillac); garage; repairing.
Moore, E. E.—Middlesex Square, Marlboro, Mass. (Lambert.)

Moore, F. C.—San Bernardino, Cal. (Maxwell.)
Moore Fuel & Feed Co.—Bisbee, Ariz. (Maxwell.)
Moore, J. G.—809 Euclid Ave., Cleveland, O. (Dolson.)
Moore, Harry S.—1761 Crawford Road, garage; repairing.
Mora Motor Car Co.—1218 Michigan Ave., Chicago, Ill. (Mora.)
Mora Motor Car Co.—52nd St. and Broadway, New York City. (Mora.)
More Bros.—Wimbledon, N. Dak. (Lambert.)
Morfin, Carlos.—Agnas Calientes, Mex. (Wayne.)
Morgan & Co., Henry.—Montreal, Canada. (Maxwell, Daimler.)
Moriarty & Co., E. P.—1612-14 Grand Ave., Kansas City, Mo. (Packard, Stevens-Duryea); garage; repair cars represented.
Morley, Jas. F.—220½ S. Spring St., Los Angeles, Cal. (Royal, Coppock.)
Morrill Motor Car Co., E. C.—5 Raitts Court, Portsmouth, N. H. (Premier.)
Morris, R. H.—1818-1820 Telegraph Ave., Oakland, Cal. (Pope-Waverley.)
Morris, A.—Columbus Grove, O. (Cadillac, Buick, Franklin); garage; repairing.
Morris Bros. Automobile Co.—149 E. 4th St., Plainfield, N. J. (Holsman, Ford, Maxwell.)
Morrison Auto Agency.—3916 Washington St., St. Louis, Mo. (Welch.)
Morrison & Price Co.—169 Huntington Ave., Boston, Mass. (Rainier.)
Morrison Co., A. E.—93 Massachusetts Ave., Boston Mass. (Stearns, Oldsmobile.)
Morrison, C. H.—603 Kansas Ave., Topeka, Kan. (Studebaker.)
Morrison, George H.—Grand Rapids, Mich. (Waltham.)
Morrissey's Automobile Station.—Pine & Shamrock Sts., Stockbridge, Mass. (Rambler.)
Morrow & Bretthauer.—John & North Sts., Middletown, N. Y. (Rambler, Ford, Frontenac.)
Morrow-Thomas Hardware Co.—Amarillo, Tex. (Northern.)
Morse, I. J.—245 N. Broad St., Philadelphia, Pa. (Locomobile.)
Mortland Automobile Co.—12th & Oak Sts., Oakland, Cal. (Glic.)
Morton, R. E. L.—Hanford, _____ well.)
Mosehart & Keller Co.—Hc (Buick.)
Moshier, Frank P. Jr.—Greer (Ford.)
Moseley, O.—Peru, Ind. (Holms.)
Mosley Haigler Electric Co.—Monery, Ala. Stoddard-Dayton.)
Motobloc Agency.—244 W. 69th New York City. (Motobloc.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Motor Car Agencies.—445-49 Golden Gate Ave., San Francisco, Cal. (Wayne, Moon, Logan, Renault, Johnson.)

Motor Car Co.—Mt. Royal & Maryland Aves., Baltimore, Md. (Peerless, Thomas Flyer, Stanley, Baker, Waltham, Knox, Stevens-Duryea.)

Motor Car Co.—1314 New York Ave, Washington, D. C. (Thomas Flyer, Peerless, Stevens-Duryea.)

Motor Car Co. of New Jersey.—291 Halsey St., Newark, N. J. (Cadillac, Northern, Autocar, Packard); garage; repairing; electric charging; supplies.

Motor Car Repair Co.—408 Orange St., Wilmington, Del. (Maxwell.)

Motor Cycle Specialty Co.—258 Columbus Ave., Boston, Mass. (Indian.)

Motor Livery Co.—249 3rd Ave., South Minneapolis, Minn. (Dragon.)

Motor Sales Co.—251 Jefferson Ave., Detroit, Mich. (De Luxe, Queen.)

Motor Sales Co.—1771 Broadway, New York City. (De Luxe.)

Motor Shop.—317 N. Broad St., Philadelphia, Pa. (Oldsmobile, Stearns.)

Motor Tavern.—Cor. Main & Front Sts., Findlay, O. (Cadillac, Franklin.)

Motor Traction Co.—323 Delta Ave., Clarksdale, Miss. (Lambert.)

Motor Transfer Co.—Richmond, Va. (Buick, Matheson, Franklin, Cadillac.)

Motor Vehicle Co.—Mulberry & Crescent Sts., Harrisburg, Pa. (Atlas, Jackson, Cameron, Ford.)

Motter, Chas. E.—York, Pa. (Stanley.)

Mount & Bros., J. W.—Maple Ave. & White St., Red Bank, N. J. (Cadillac, Maxwell.)

Mt. Diablo Garage.—Cor. Fernando & Colfax Sts., Concord, Cal. (Rambler); garage; repairing.

Mt. Vernon Motor Co.—1118 Cathedral St., Baltimore, Md. (Autocar, Haynes, Panhard, Mercedes, Isotta.)

Mueller, L. J.—6417 Woodland Ave., Cleveland, O. (Indian, Merkel.)

Muller, Cahoon Co.—Salt Lake City, Utah. (Pope-Waverley.)

Mullen, J. T.—Trappe, Md. (Cadillac.)

Mulock's Belmont Garage.—13 & 15 S. Carolina Ave., Atlantic City, N. J. (Rambler, Pullman); garage; g.

John B.—Powellton, Ill. (Wal-

Oneonta, N. Y. (Max-

Garage.—32 E. 40th St., New York City. Second-hand cars.

ay, J. L.—215 S. Main St., Bloomington, Ill. (Cadillac.)

ay, T. S.—Chester, N. Y. (Maxwell.)

Murphy, A. H.—918 State St., Erie, Pa. (Pope-Toledo, Rauch & Lang, Elmore.)

Murphy & Cooley.—Hartford City, Ind (National.)

Murphy Bros.—22 Park Row, Erie, Pa (Franklin, Winton, Thomas Flyer.)

Muskegon Bicycle & Auto Co.—18-20 Clay Ave., Muskegon, Mich. (Rambler, Maxwell.)

Mutual Elec. Co.—Duluth, Minn. (Pope-Toledo.)

Mutual Electric Co.—Kokomo, Ind. (Haynes, Pope-Waverley.)

Mutual Supply Co.—2210 Farnam St., Omaha, Neb. (Monarch.)

Myers, Fred, Sr.—Redfield, S. Dak. (Cadillac.)

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Nadig Mfg. Co., Chas. H.—N. 4th St., Allentown, Pa. (Waltham.)

Nado, Lewis A.—Danielson, Conn. (Rambler.)

Nalle, Ewell.—601 E. 6th St., Austin, Tex. (Thomas, Buick); repair cars represented.

Napier, Geo. R.—Macon, Ga. (Maxwell.)

Nash, J. H.—Orona, Me. (Ford.)

Nash, W. B.—Machias, Me. (Waltham.)

Nashville Motor Car Co.—9th Ave., & Church St., Nashville, Tenn. (Ford, Dorris.)

National Auto & Supply Co.—Cor. Duke & Vail Sts., Lancaster, Pa. (Rambler, Crawford, Marmon.)

National Auto Co.—New Orleans, La. (Monarch.)

National Auto Co.—1711 14th St., Washington, D. C. (Oldsmobile, Studebaker.)

National Motor Car Co.—957 S. Main St., Los Angeles, Cal. (National, Triumph, Pierce-Racine, F. N. Motorcycle.)

National Motor Car Co.—Oakland, Cal. (Chadwick, Jackson, National, Queen.)

National Supply Co.—Philadelphia, Pa. (Waltham.)

Neakes Bros.—Corpus Christi, Tex. (Cadillac.)

Neal & Clark & Neal Co.—643 Main St., Buffalo, N. Y. (Indian, Reliance.)

Neeley, N. A.—Christchurch, New Zealand. (Wayne.)

Negley, Charles.—Farmington, Ill. (Buick.)

Neiheisel Bros.—Boulder, Colo. (White, Smith, Autocar, Franklin, Jackson, Ford.)

Nelms, Robert.—42 W. Adams St., Jacksonville, Fla. (Queen.)

Nelson Auto Co.—216 Main St., Springfield, Mass. (Buick.)

Nelson, E. R.—Ishpeming, Mich. (Franklin.)

Nelson House Garage.—34 Market St., Poughkeepsie, N. Y. (Maxwell.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Nelson & Co., J. A.—Round Rock, Tex. (Mitchell.)
Nelson, W. H.—Smith Center, Kan. (Waltham.)
Nettleton & Co., V. L.—21 Hanchett St., Coldwater, Mich. (Rambler, Maxwell); garage; repairing.
Neubling, John G.—8843 Penn Ave., Reading, Pa. (Indian.)
Neuman & Co., Wm. F. V.—736 Woodward Ave., Detroit, Mich. (Wayne, Pope-Waverley, Stoddard-Dayton, Welch, White, Soules, Baker.)
Nevada Automobile & Supply Co.—N. Main St., Goldfield, Nev. (Office, 115 Ramsey St., Goldfield, Nev. (Pope-Toledo, Northern); garage; repairing.
Neville & Co.—Oshkosh, Wis. (Pope-Toledo.)
Nevin, Ernest D.—507 Wood Ave., Pittsburgh, Pa. (Darracq.)
New Amsterdam Motor Car Co.—Brooklyn, N. Y. (Crawford.)
New Amsterdam Motor Co.—152 W. 86th St., New York City. (Crawford.)
Newark Motor Car Co.—126-128 S. 14th St., Newark, N. J. (Wayne, Reo, Premier.)
Newburn, J. R.—Union City, Ind. (Northern.)
Newburg Auto Shop.—249 Grand St., Newburg, N. Y. (Winton); garage; repairs.
Newby's Auto Inn.—1122 W. Broad St., New Castle, Ind. (Maxwell, Premier, National, Rambler.)
New Castle Auto Co.—27 Cockram St., New Castle, Pa. (Pope-Toledo.)
Newcomb Auto Co.—Wildwood, N. J. (Cadillac.)
New Columbia Machine Works.—239 Pearl St., Fort Wayne, Ind. (Kiblinger.)
Newcomb, F. S.—Post Hill, New London, Conn. (Maxwell.)
Newell, C. H.—Coldwater, Mich. (Waltham.)
Newell, Jas. R.—819 Hay St., Wilkesburg, Pa. (Elmore.)
New England Auto Co.—55 Berkeley St., Boston, Mass., and 26 Market Sq., Providence, R. I. (Second-hand cars.)
New Haven Auto Corp.—53 Broadway, New Haven, Conn. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
New Era Co.—56 Galen St., Watertown, Mass. (Glide.)
New Jersey Automobile Co.—855 Springfield Ave., Newark, N. J. (Moline); garage; repairing.
New Jersey Motor Co.—49-51 Bank St., Newark, N. J. (Ford.)
Newlin, W. G.—128 Pipestone St., Benton Harbor, Mich. (Rambler.)

New London Auto Station.—New London, Conn. (Thomas Flyer, Thomas Detroit, Haynes); garage; repairing.
Newman Investment Co.—El Paso, Tex. (Buick.)
Newman, J. E.—1841 Market St., San Francisco, Cal. (Rapid.)
Newman, O. H.—Belmar, N. J. (Maxwell.)
Newmarch, L. A.—Sidney, New South Wales, (Lambert.)
Newton, J. E.—Bedford & Troy Sts., Fall River, Mass. (Stevens-Duryea.)
New York Auto Co.—State & Lafayette Sts., Utica, N. Y. (Reo.)
New York Motor Car Co.—231 W. 40th St., New York City. (Atlas Trucks.)
New York Transportation Co.—49th St. and 8th Ave., New York City. (Columbia cars and Exide batteries.) Rental service; garages at 19 Downing St., Newport, R. I.; and 66th St. and 3rd Ave., 27th St. and 9th Ave., Bayard St. and Bowery, New York City.
Niagara Falls Auto Transit Co.—103 Maine St., Niagara Falls, N. Y. (Cadillac, Winton); garage; repairing; supplies.)
Nickerson Co., F. A.—642 Congress St., Portland, Me. (Pierce Arrow.)
Nickerson, Ed.—Bourne, Mass. (Waltham.)
Nichols & Co., D. P.—220 Eliot St., Boston, Mass. (Frayer-Miller.)
Nicholas, J. Hervey.—1636 Broadway, Denver, Col. (Winton.)
Nichols, Scott D.—Federal & Front Sts., Troy, N. Y. (Ford, Premier, Maxwell, Rambler.)
Nipp, Chas. F.—Mimwha, Iowa. (Waltham.)
Noakes Bros.—Corpus Christi, Tex. (Buick.)
Neck Auto Co.—141 Dyer St., Providence, R. I. (Stoddard-Dayton.)
Noonan Tool & Machine Works.—Rome, N. Y. (Rambler.)
Norbeck & Nicholson.—Redfield, N. D. (Maxwell.)
Norcross Auto Co.—43 Foster St., Worcester, Mass. (Buick.)
Norcross Cameron Co.—57 Bridge St., Springfield, Mass. (Rambler, Corbin, Ford); garage; supplies.
Norris Automobile Co.—Genesee Ave., Saginaw, Mich. (Buick, Oldsmobile, Woods, Cadillac)
Northern Auto Co.—4th Ave., San Francisco.
Northern Auto Co.—14 Chicago, Ill. (Peerle)
Northern Automobile Square, Motor Mart, B (Northern); repairing.
Northampton Garage.—1 Mass. (Atlas.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

North Jersey Auto & Eng. Co., Inc.—Hackensack, N.J. (Mercedes, Winton.)
North Shore Auto Garage.—250 Harrison St., North Evanston, Ill. (Buick.)
Northway, Thomas J.—92 Exchange St., Rochester, N. Y. (Rainier, Rambler, Ford, White, Reo.)
Northwestern Auto Co.—Aberdeen, S. Dak. (Cadillac.)
Northwestern Cadillac Co.—316-322 4th Ave., Minneapolis, Minn. (Cadillac, Pope-Waverley.)
Northwestern Motor Car Co.—1928-30 N. 20th St., Philadelphia, Pa. (Moline); garage; repairing.
Northwestern Motor Co.—Broadway and Union St., Seattle, Wash. (White, Columbus.)
Norton Auto Co., S. E.—14 E. 1st St., La Junta, Colo. (Waltham.)
Nourse, F. R.—Louiston, Ida. (Holsman.)
Noyes, H. G.—Gorham, N. H. (Jackson.)
Nute & Keena.—Seattle, Wash. (Packard.)
Nutzel, Fred.—1108 S. 5th St., La Crosse, Wis. (Rambler.)
Nyack Auto Garage.—68 Burd St., Nyack, N. Y. (Maxwell.)
Nyberg, P. J.—Yankton, S. Dak. (Cadillac.)
Nye, John.—Salt Lake City, Utah. (Waltham.)

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Oathout, Chas. W.—160 Broad St., Newark, N. J. (Jackson.)
O'Brien, M. R.—22 Wood Ave., Providence, R. I. (Dolson.)
Occident Motor Car Co.—2731 W. Pico St., Los Angeles, Cal. (Cartercar.)
Oden Auto Co., J. P.—26 W. Philadelphia St., York, Pa. (Mitchell.)
Offenbacher, A. B.—525 3rd St., Marietta, O. (Pope-Waverley.)
Ogden, D.—332 5th St., Columbus, Ind. (Reo, Jackson, Wayne, Haynes); garage; repairs.
Ohio Motor Car Co.—2142 E. 9th St., Cleveland, O. (Buick, Columbia, Waltham, Haynes.)
Ohio Pail Co.—Middlefield, O. (Monarch.)
Ohio Valley Auto Co.—Greenup, Ky. (Rambler); repairing.
Ohler, J. O.—Lima, O. (Mitchell.)
Ohmacht, L. W.—Cresco, Ia. (Holsman.)
Olmsted & Son, H. R.—413 S. Clinton St., Syracuse, N. Y. (Indian.)
Ohnhaus Automobile Co.—219 Pearl St., Fort Wayne, Ind. (Buick, Jackson, Oldsmobile.)
Okado Bros.—Osaka, Japan. (Monarch.)

Oklahoma Automobile Co.—806 Broadway, Enid, Okla. (Cadillac, American.)
Oklahoma Motor Car Co.—515 W. Main St., Oklahoma City, Okla. (Rambler, Ford, Pope-Waverley, Reliance, Mason, American.)
Olds, Arthur L.—Charles City, Iowa. (Jackson.)
Olds, H. B.—315 Columbia St., Fort Wayne, Ind. (Stearns.)
Oldsmobile Co.—1010 Prospect Ave., Cleveland, O. (Oldsmobile.)
Oldsmobile Co.—1328 Michigan Ave., Chicago, Ill. (Oldsmobile.)
Oldsmobile Co.—1653 Broadway, New York. (Oldsmobile.)
Olewine, B. J.—Newcastle, Brunswick, Ga. (Pope-Hartford.)
Oliver & Kemp.—West Pike St., Pontiac, Mich. (Jackson, Maxwell.)
Oliver, S. C.—29 W. Forsythe St., Jacksonville, Fla. (Ford.)
Olsen, Oscar L.—Lincoln, Neb. (Waltham.)
O'Neill & Bros., A. A.—City Hall Ave. & Randolph St., Norfolk, Va. (Rambler.)
O'Neill's Auto Station.—574 Common St., Lawrence, Mass. (Premier, Ford.)
Oneonta Automobile Garage.—23 Dietz St., Oneonta, N. Y. (Haynes, Waltham, Oldsmobile.)
Onondaga Garage.—54 S. Clinton St., Syracuse, N. Y. (Pope-Hartford.)
Opp's Hardware Co.—Otterbein, Ind. (Lambert.)
Orange Auto Garage.—Essex Ave. & R. R. Pl., Orange, N. J. (Franklin, Pope-Hartford, Pope-Toledo.)
Orange Valley Garage.—948 Main St., Riverside, Cal. (Reo, Jackson, Royal.)
Orient Buckboard Supply Co.—110 Park St., Albion, Mich. (Waltham.)
Orlando-Kessler Auto Co.—36 W. Capitol St., Columbus, O. (Lozier.)
Ormond Automobile Co.—2 Jefferson Ave., Brooklyn, N. Y. (Columbia.)
Ormond Beach Garage.—Ormond, Fla. (Cadillac.)
Osborn, C. H.—405 S. Superior St., Albion, Mich. (Rambler, Waltham, Queen.)
Osbun Iron Works.—Redlands, Cal. (Royal); garage; repairing.
Osbun's Sons, J. F.—Clarksburg, W. Va. (Cadillac.)
Osen-Hunter Auto Co.—50 W. St. John St., San Jose, Cal. (Mitchell.)
Osen-Hunter Automobile Co.—407 Golden Gate Ave., San Francisco, Cal. (Mitchell.)
Ostlunds Garage & Machine Shop.—1320 4th Ave., Moline, Ill. (Maxwell.)
Outcalt Mfg. Co.—Spotswood, N. J. (Dragon.)
Overland Motor Car Co.—1333 Broadway, Denver, Colo. (Cartercar.)

**AUTOMOBILE AGENTS AND
DEALERS (Continued)**

Overs, C. E.—2nd St., Ashland, O. (Ford, Mitchell.)
Overton, L. W.—Traveler St., Southhold, N. Y. (Waltham.)
Ovington Mfg. Co.—2208 Broadway, New York City. (F. N. Motorcycle.)
Owen & Co., R. M.—Lansing, Mich. (Reo.)
Owen & Co., R. M.—1344 Michigan Ave., Chicago, Ill. (Reo, Premier.)
Owen & Co., R. M.—1659 Broadway, New York, N. Y. (Reo, Premier.)
Owen, H. F.—Delaware, O. (Cameron.)
Owen, Inc., Percy.—62nd St. and Broadway, New York City. (Bianchi.) Repairing cars represented.
Owensboro Auto Co., Inc.—Frederica and 4th Sts., Owensboro, Ky. (Columbia, Ford.)
Owen, Thos. G.—379 Franklin St., Newport, R. I. (Rambler.)
Oxford Auto Station.—Lynn, Mass. (Winton.)

P

Pacific Automobile Co.—1028 S. Main St., Los Angeles, Cal. (De Luxe, Queen, Overland.)
Pacific Coast Automobile Co.—Seattle, Wash. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Thomas Flyer, Thomas Detroit, Buick, Oldsmobile); garage; repairing.
Pacific Commercial Car Co.—Seattle, Wash. (Cartercar.)
Pacific Commercial Car Co.—8th and Pacific Aves., Tacoma, Wash. (Cartercar, Lambert.)
Pacific Motor Car Co.—1416 Broadway, Oakland, Cal. (Stevens-Duryea.)
Pacific Motor Car Co.—376 Golden Gate Ave., San Francisco, Cal. (Packard, Stevens-Duryea, Woods.)
Packard, J. E.—Augusta, Me. (Cadillac.)
Packard Motor Car Co.—Broadway & 61st St., New York City. (Packard); garage.
Paddock, N. H.—Holdredge, Neb. (Maxwell.)
Padgett, J. M.—Topeka, Kan. (Pope-Waverley.)
Page & Co., Carl.—Newark, N. J., and Bridgeport, Conn. (Peerless.)
Page & Co., W. A.—220 Elliott St., Boston, Mass. (Simplicity.)
Pagel, Dr. C. M.—St. Paul, Minn. (Holzman.)
Paige, E. W.—46 Washington Ave., Batavia, N. Y. (Ford.)
Paige, M. M.—302 Highland Drive, Seattle, Wash. (Lambert.)
Paige, Walter M.—131 Cass St., Traverse City, Mich. (Maxwell.)
Painter, G. W.—Winston, N. C. (Buick.)

Palace Auto Co.—1408-1410 Walnut St., Kansas City, Mo. (Pierce Arrow, Oldsmobile, Columbia); garage; repairing.
Palace Auto Station Co.—348 Trumbull St., Hartford, Conn. (Thomas Flyer, Autocar, Oldsmobile); garage.
Palace Automobile Station.—32 Hermon St., Worcester, Mass. (Rambler); garage; repairing.
Palace Garage.—540 Washington St., Camden, N. J. (Cadillac, Autocar.)
Palais de l'Automobile.—Broadway and 57th St., New York City. (Delaunay-Belleville, Panhard, Renault.)
Palis, F. W.—Spring St., Shreveport, La. (Buick, Jewel, Stoddard-Dayton.)
Palisade Auto Co.—Palisade Ave. and Hackensack Plank Rd., Weehawken, N. J. (Cadillac, Peerless, Pope-Hartford, Pope-Waverley.)
Palmer & Peck.—Oakland, Cal. (Auburn.)
Palmer & Singer Mfg. Co.—1620-1624 Broadway, New York City. (Simplex, Isotta Fraschini, P. & S.) Garage and repairing.
Palmer & Singer Mfg. Co. of New York.—1321 Michigan Ave., Chicago, Ill. (Simplex, Isotta Franchini, P. & S.)
Palmer. Auto Garage.—Palmer, Mass. (Olds.)
Palmer, Frank.—40-50 Jefferson Ave., Battle Creek, Mich. (Reo); garage; repairs; supplies.
Palo Alto Hardware & Improvement Co.—Emmetsburg, Ia. (Waltham.)
Panhard & Levassor.—222 Elliott St., Boston, Mass. (Panhard.)
Panhard & Levassor.—Broadway and 62d St., New York City. (Panhard.)
Pape, Otto.—Berlin, Germany. (Pope-Toledo.)
Pardee & Canary, Inc.—1218 Michigan Ave., Chicago, Ill. (Mors, Renault, Mora.)
Paris Foundry & Machine Works.—Paris, Ill. (Buick, Waltham.)
Parker & Co., F. R.—288 Columbus Ave., Boston, Mass. (Elmore.)
Park Automobile Co.—2359 Madison Ave., Baltimore, Md. (Frayser-Miller.)
Park Automobile Co.—4432 Olive St., St. Louis, Mo. (Thomas Flyer, Baker, Autocar.)
Parker, F. H.—Gardner, Mass. (Maxwell.)
Parker & Co., F. R.—228 Columbus Ave., Boston, Mass. (Elmore.)
Parker & Co., F. R.—Concor (Cadillac.)
Parker Co., J. P.—46-48 S. Second, Memphis, Tenn. (Stoddard-Dayton.)
Parker, David L., Co.—Auto Station Market St., New Bedford, M (Pope-Toledo, Pope-Hartford); age; repairing; supplies.
Parker, Robert.—Remington, Ind (Waltham.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Parkersburg Auto Co.**—607 Julian St., Parkersburg, W. Va. (White, Pope-Waverley.)
- Parker, Wm. A.**—1a Independencia 12, Mexico City, Mexico. (Elmore.)
- Park Garage.**—425 Main St., Chico, Cal. (Ford, Rambler.)
- Park Garage.**—Brooklyn, N. Y. (Walter.)
- Park Garage Co.**—210 W. Ohio St., Allegheny, Pa. (Walter, Corbin.)
- Park Hardware Co.**—Warren, Ohio. (Jewel.)
- Park, J. W.**—Fruit Land, Fla. (Carter-car.)
- Parkes, E. T.**—Fidelity Bldg., Buffalo, N. Y. (Autocar.)
- Parks, A. S.**—Wichita, Kan. (Locomobile.)
- Park Square Auto Station.**—43 Columbus Ave., Boston, Mass. (Stoddard-Dayton, Berliet); garage; repairing.
- Parsons, F. G.**—500 Main St., Stamford, Conn. (Waltham.)
- Parsons, J. C.**—410 N. Main St., Rushville, Ind. (Cameron.)
- Passaic Motor Car Co.**—147 Main Ave., Passaic, N. J. (Pope-Waverley.)
- Pastre Ellis Automobile Garage.**—Ocean Parkway, Brooklyn, N. Y. (National, Rambler.)
- Paterson Auto Exchange.**—10 Crosby Place, Paterson, N. J. (Cadillac, Haynes, Franklin.)
- Paterson, Geo. S.**—254 Euclid Ave., Cleveland, O. (Reo, Premier.)
- Paterson, James.**—Red Cloud, Neb. (Mitchell.)
- Paterson Vehicle Co.**—257 Market St., Paterson, N. J. (Jackson.)
- Patnot, A. F.**—Hanford, Cal. (Pope.)
- Patten, W. N.**—Honolulu, Hawaiian Islands. (Waltham.)
- Patterson, F. H.**—Fredonia, Kan. (Waltham.)
- Paulman & Co., H.**—1430 Michigan Ave., Chicago, Ill. (Pierce Arrow.)
- Pawler, P.**—Calumet, Mich. (Wayne.)
- Pawtucket Auto Co.**—4 Mason St., Pawtucket, R. I. (Winton, Cadillac, Studebaker, Oldsmobile, Maxwell.)
- Payne, John R. Co., Inc.**—Albany, N. Y. (Stearns.)

Auto Repair Garage.—161 Main St., Passaic, N. J. (Reo, Premier.)

on, Warren.—Troy, Ohio. (Wal-

Anderson.—Greenburg, Ind.

& White.—Anawan St., Fall River, ss. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

& White.—Weir St., Taunton, ss. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

- Peck, C. S.**—Shelbyville, Ind. (Cadillac.)
- Peckham Carriage Co.**—19 S. Kenton St., Dayton, O. (Buick, Cadillac, White.)
- Peckham, F. W., Motor Syndicate.**—40 Sackville St., Picadilly, London, England. (Maxwell.)
- Pecos Auto Co.**—Pecos, Tex. (Acme.)
- Pedigo, R. E.**—Lucas, Iowa. (Waltham.)
- Peerless Garage.**—942-944 Bedford Ave., Brooklyn, N. Y. (Peerless); garage; repairing.
- Peerless Garage Co.**—Union Bldg., Newark, N. J. (Peerless.)
- Peerless Motor Car Co. of N. E.**—178 Columbus Ave., Boston, Mass. (Peerless); garage; repairing.
- Peerless Motor Car Co.**—220 W. 41st St., New York City. (Peerless); garage; repairing.
- Pegues, P. T.**—Imperial Hotel, Dallas, Tex. (Lambert.)
- Pelton, Chas E.**—7 Shady Ave., Knoxville, N. Y. (Knox.)
- Pelton Grissel Auto Co.**—Fresno, Cal. (Maxwell.)
- Pence Automobile Co.**—717 Hennepin Ave., Minneapolis, Minn. (Buick, Packard, Pierce Arrow, Stevens-Duryea, Waltham, Pope-Toledo.)
- Pendleton, W. H. E.**—7th and Grand Ave., Los Angeles, Cal. (Austin.)
- Penn Automobile Co.**—31 Wood St., Reading, Pa. (Thomas Flyer.)
- Penn Auto Co.**—Pittsburg, Pa. (Crawford, Marmon.)
- Penn Motor Car Co.**—680 N. Broad St., Philadelphia, Pa. (Mitchell.)
- Pennsylvania Auto Agency.**—7 Motor Mart, Park Square, Boston, Mass. (Pennsylvania, Pullman, Northern); repairing.
- Pennsylvania Auto Co.**—2234 Broadway, N. Y. City. (Pennsylvania.)
- Pennsylvania Automobile Co.**—Hay St. & Kelly Ave., Wilkesburg, Pa. (Crawford, Marmon.)
- Peoria Auto Co.**—711 Main St., Peoria, Ill. (Pope-Toledo, Pope-Waverley, Cadillac, Franklin.)
- Peper Automobile Co.**—3922 Olive St., St. Louis, Mo. (American, Maxwell.)
- Percival, E. W., Jr.**—Fayetteville, N. C. (Waltham.)
- Peretti & Co.**—Florence, Italy. (Dragon.)
- Perkins & Corliss.**—65 Middle St., cor. Center St., Gloucester, Mass. (Maxwell, Rambler); repairs; supplies.
- Perkins & Corliss.**—Manchester, Mass. (Maxwell, Stevens-Duryea.)
- Perkins Auto Garage.**—Main St., Rockaway, N. J. (Corbin); garage; repairing.
- Perkins, B. B.**—St. Albans, Vt. (Cadillac, Franklin); garage; repairing.

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Perkins, B. C.**—504 Tchonpitolins Ave., New Orleans, La. (Apperson.)
- Perkins, F. H.**—White River Junction, Vt. (Cadillac, Stanley.)
- Perry, F. R.**—851 Whitney Ave., New Haven, Conn. (Jackson.)
- Perry, F. W.**—21 Court St., Taunton, Mass. (Maxwell.)
- Peters & Kittell.**—Cass & Union Sts., Hornell, N. Y. (Rambler.)
- Petern Bros.**—Millard, Neb. (Rambler.)
- Peterson, A. W.**—320 W. 3rd St., Davenport, Iowa. (Monarch.)
- Peterson, N. E.**—1520 Belmont Ave. Seattle, Wash. (Stearns.)
- Petersen, Dr. W. A.**—Elgin, Neb. (Holsman.)
- Petrie, Harrington & Co.**—Madison, Wis. (Rambler.)
- Pettis & Bolton.**—427 S. Saginaw St., Flint, Mich. (Ford.)
- Pettier, W.**—Fort Wayne, Ind. (Pope-Toledo.)
- Pfeffer, T. S.**—York, Pa. (Jewel.)
- Pfizenmayer, C. A.**—Duncan Hall, New Haven, Conn. (Winton.)
- Pfultz, D. G.**—N. Second St., Chambersburg, Pa. (Franklin, Cadillac, Pope.)
- Phelps, G. H.**—38 Central St., Worcester, Mass. (Corbin.)
- Philadelphia Auto Co.**—338 N. Broad St., Philadelphia, Pa. (Apperson.)
- Philadelphia Auto Sales Co.**—Philadelphia, Pa. (Jewel, Reliance, Dolson.)
- Philadelphia Motor Car Co.**—236 N. Broad St., Philadelphia, Pa. (Frayer-Miller.)
- Phillips & Wrinch, Ltd.**—76 Bay St., Toronto, Canada. (Mitchell.)
- Phillips, S. M.**—Sacramento, Cal. (Auto-car, Columbia.)
- Phil-Penn Motor Co.**—206 Drexel Bldg., Philadelphia, Pa. (Frayer-Miller.)
- Phoenix Light & Fuel Co.**—Phoenix, Ariz. (Cadillac.)
- Pickering Hardware Co.**—Cincinnati, O. (Indian.)
- Piedmont Motor Car Co.**—88 N. Pryor St., Atlanta, Ga. (Pope-Waverley, Marmon.)
- Pierce, A. L.**—Wallingford, Conn. (Waltham.)
- Pierce & Holson.**—Triscott, Kan. (Waltham.)
- Pierce & Isbell.**—1413 Michigan Ave., Chicago, Ill. (Baker.)
- Pierce Auto Co.**—109 S. State St., Syracuse, N. Y. (Oldsmobile.)
- Pierce Co., Geo. N., The.**—762 Golden Gate Ave., San Francisco, Cal. (Pierce Arrow.)
- Pierce Co., Geo. N., The.**—752 Main St., City Sales Department, Buffalo, N. Y. (Pierce Arrow.)
- Pierce Engine Co.**—1421 Michigan Ave., Chicago, Ill. (Pierce-Racine.)
- Pierce Engine Co.**—2200 Clark St., Racine, Wis. (Pierce-Racine.)
- Pierce Hardware Co., The.**—Taunton, Mass. (Waltham.)
- Pierre, Bremond.**—107 E. 6th St., Austin, Tex. (Haynes.)
- Pierson, Roy.**—Janesville, Wis. (Maxwell.)
- Pilling, A. J.**—Locust St. and Beach Rd., Winthrop, Mass. (Waltham.)
- Pilot Garage & Supply Co.**—185 Commercial St., Worcester, Mass. (Pope-Hartford, Pope-Toledo.)
- Pindar, W. J.**—Middleburgh, N. Y. (Mitchell.)
- Pingrey, C. H.**—Eddy Bldg., Bloomington, Ill. (Reo.)
- Pinkerton, W. A.**—Aberdeen, S. Dak. (Cartercar.)
- Pinn, W. T.**—Michigan City, Ind. (Waltham.)
- Pioneer Auto Co.**—Long Beach, Cal. (Rambler.)
- Pioneer Auto Co.**—Tucson, Ariz. (Buick.)
- Pioneer Auto Co.**—901 Golden Gate Ave., San Francisco, Cal. (Isotta-Fraschini, Mercedes, Olds, Panhard, Simplex, Thomas-Detroit, Thomas Flyer, Winton.)
- Pioneer Automobile Co.**—520-534 20th St., Oakland, Cal. (Winton, Thomas, Oldsmobile); garage; repairing.
- Pioneer Automobile Co.**—Benton Harbor, Mich. (Franklin.)
- Pioneer Garage.**—420 4th St., Eureka, Cal. (Mitchell.)
- Piper, L. W.**—310 Main St., Stroudsburg, Pa. (Dragon.)
- Pitman & Nelson Auto Co.**—491 Golden Gate Ave., San Francisco, Cal. (Page Adrian.)
- Pitman & Nelson Auto Co.**—2036 Addison St., Berkeley, Cal. (Page-Adrian); repairing; garage.
- Pitts & Wiseley.**—Roswell, New Mexico. (Lambert.)
- Pittsburgh Automobile Co.**—Pittsburgh, Kan. (Pungs-Finch.)
- Pittsburgh Auto Co.**—2213 Farmers' Bank Bldg., Pittsburg, Pa. (Thomas Flyer.)
- Pittsfield Auto Garage Co.**—228 North St., Pittsfield, Mass. (Rambler, Berkshire); garage; repair.
- Pixley, O. C.**—Des Moines (Des Moines Co., Des Moines, Iowa.)
- Placek, F. A.**—Millington, Ill. (Waltham.)
- Plainfield Motor Car Co.**—Plainfield, N. J. (Mitchell)
- Plank, A. E.**—Quincy, Ill.
- Plaza Automobile Co.**—918 Union St., Brooklyn, N. Y. (Reo, Premier); second-hand cars.

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Pletcher, M. H.**—Harrisburg, Pa. (Monarch.)
- Pollard, Dr. James.**—Farmington, Ill. (Jackson.)
- Pollard Auto Station.**—230 Main St., Nashua, N. H. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, Cadillac); garage; repairing.
- Polhill, John H.**—Fitzgerald, Ga. (Pope-Hartford.)
- Pomeroy, S. G.**—West Lebanon, Ind. (Waltham.)
- Pomona Garage Co.**—Pomona, Cal. (Reo.)
- Pon & Whatley.**—Columbus, Ga. (Buick, Cadillac.)
- Pond Machine & Foundry Co., L. H.**—186 Main St., Worcester, Mass. (Premier, Reo, Maxwell, Ford, Pope-Waverley, Mercedes.)
- Poole, C. W.**—1423 10th Ave., Seattle, Wash. (Cleveland.)
- Pope Auto Co.**—Cedar and Halsey Sts., Newark, N. J. (Pope-Hartford.)
- Pope Automobile Co. of Washington.**—817-819 14th St., N. W., Washington, D. C. Pope-Toledo, Pope-Hartford, Pope-Waverley, Locomobile, Autocar); garage; repairing.
- Pope Mfg. Co.**—436 Capitol Ave., Hartford, Conn. (Pope-Hartford, Pope-Toledo.)
- Pope Motor Car Co.**—Toledo, Ohio. (Pope-Toledo.)
- Pope-Toledo Motor Car Co.**—425 Delaware St., Kansas City, Mo. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Poppenberg Automobile Co.**—674-676 Main St., Buffalo, N. Y. (Rambler, Reo, Premier, Reliance.)
- Porrier, A.**—Garden City, Long Island, N. Y. (Maxwell); garage; repairing.
- Porter, F. R.**—East Stroudsburg, Pa. (Rambler.)
- Porter, Walter R.**—Keene, N. H. (Elmore.)
- Portland Co., The.**—Portland, Me. (Knox.)
- Portsmouth Garage, The.**—Fleet St., Portsmouth, N. H. (Stevens-Duryea.)
- Post, Amos.**—Catskill, N. Y. (Franklin.)
- Post, E. L.**—Cold Spring, N. Y. (Waltham.)
- Potchernick, M.**—East Houston St., San Antonio, Tex. (Maxwell.)
- Potter, Sidney E.**—Bet. Elm & Walnut Sts. Pierce City, Mo. (Ford); garage; repairing.
- Potter, W. N. & Sons.**—Newfield, Mass. (Atlas.)
- Powell Automobile Co.**—Omaha, Neb. (Baker, Cadillac, Franklin, White.)
- Powell's Garage.**—1404 Ridge Ave., Philadelphia, Pa. (Frayer-Miller.)
- Powers, A. H.**—San Francisco, Cal. (Waltham.)
- Power Vehicle Service Co.**—North & Madison Avenues., Baltimore, Md. (Welch.)
- Poyer, D. F.**—518 Main St., Menominee, Mich. (Buick, Cadillac.)
- Prasch, P. S.**—Buck St., Paulsboro, N. J. (Waltham.)
- Pratt, A. J.**—Coldwater, Mich. (Buick.)
- Pratt, Geo. B.**—Elkhart, Ind. (Locomobile.)
- Prentiss Motor Car & Supply Co.**—15 Berkeley St., Boston, Mass. (Studebaker.)
- Prescott, Adamson.**—Broad & Spring-Garden Sts., Philadelphia, Pa. (Columbia.)
- Preston Auto Co.**—Waitsburg, Wash. (Oldsmobile.)
- Price Bros.**—Huron St., Cleveland, O. (Baker.)
- Price, C. W.**—Greenfield, O. (Cadillac.)
- Price, P. M.**—Johnstown, Pa. (Stearns.)
- Pritchard, Percy.**—Utica, N. Y. (Maxwell.)
- Prichard, R. S.**—39-41 Gallia Ave., Portsmouth, O. (Buick, Pope-Waverley, Winton); garage; repairing.
- Priebe Carriage Co., C.**—205 S. 4th St., St. Joseph, Mo. (National.)
- Princeton Garage Co.**—Nassau St., Princeton, N. J. (Maxwell.)
- Prindle, B. A.**—Barre, Vt. (Elmore.)
- Pritchett, H. E.**—Jacksonville, Fla. (Franklin.)
- Procasky, Charles.**—411 Main St., Belleville Ill. (Dorris, Rambler.)
- Proctor, E. O.**—W. Main St., Ayer, Mass. (Jackson, Logan.)
- Proctor Supply Co., G. H.**—31 Stanhope St., Boston, Mass. (Stanley.)
- Prospect Park S. Garage.**—Coney Island & Church Aves., Brooklyn, N. Y. (Crawford.)
- Prout & Sons, A. H.**—Sandusky, O. (Frayer-Miller.)
- Provines, Harris G.**—Seneca, Mo. (Waltham.)
- Pueblo Automobile Co.**—Cor. Court & 4th Sts., Pueblo, Colo. (Pope-Waverley, Dragon, Ford.)
- Pueblo Elect. Co.**—117 W. 4th St., Pueblo, Colo. (Frayer-Miller, Cameron.)
- Pueblo Novelty Works.**—310 N. Main St., Pueblo, Colo. (Rambler.)
- Puget Sound Auto Co.**—1405-07 Broadway, Seattle, Wash. (National, Rambler, Commerce trucks); garage; repairing.
- Pugh Bros.**—15 Snow St., Providence, R. I. (Corbin, Elmore.)
- Pullman Auto Agency.**—7 Motor Mart, Boston, Mass. (Pennsylvania, Pullman, Northern); repairing.
- Pullman Motor Car Co.**—Chicago, Ill. (Pullman Flyer.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Pullman Motor Car Co.**—1140 S. Main St., Los Angeles, Cal. (Pullman Flyer.)
Pullman Motor Car Co.—Portland, Ore. (Jackson.)
Pullman Motor & Vehicle Co.—Fisher Bldg., Chicago, Ill. (Model.)
Pullman Motor Car Co.—W. S. Duvall, Pres., Loan & Trust Bldg., Washington, D. C. (Pullman Flyer.)
Pullman, C. R.—Little Rock, Ark. (Logan.)
Purington, A. B.—126 Exchange St., Bangor, Me. (Columbia); garage; repairs, supplies.
Puritan Motor Co.—43 Columbus Ave., Boston, Mass. (Dolson, Mason.)
Putnam, C. M.—Moriah, N. Y. (Waltham.)
Putnam Garage Co.—Putnam, Conn. (Jackson.)
Putman Nelson Auto Co.—Berkeley, Cal. (Simplicity.)
Putzel, Morris.—Macon, Ga. (Ford.)
Pyramid Motor Car Co.—31 New St., Danbury, Conn. (White, Pope-Hartford, Pope-Toledo, Pope-Waverley, Cadillac.)

Q

- Quackenbush Co., W. H.**—Westfield, N. J. (Ford, Maxwell, Mitchell, Premier, Reo.)
Quaker City Auto Co.—Ohio & Atlantic Aves., Atlantic City, N. J. (Maxwell.)
Quaker City Auto Co.—144 N. Broad St., Philadelphia, Pa. (Pope-Toledo, Pope-Hartford, Peerless); garage; repairing.
Quebec Auto & Launch Co.—Cor. St. Augustin & St. Patrick, Quebec, Canada. (Russell, Reo, Ford, Pope-Toledo, Pope-Hartford, Pope-Waverley.)
Queen City Auto Co.—538 W. Micken Ave., Cincinnati, Ohio. (Knox, Waltham.)
Queen City Garage.—2203-2207 2nd Ave., Seattle, Wash. (Apperson.)
Queen City Auto Repair Works.—2201-2203 2nd Ave., Seattle, Wash. (Reliance.)
Quinby & Co., J. M.—27 Division St., Newark, N. J. (Renault, Panhard.)
Quincy Auto Co.—Quincy, Ill. (White.)
Quinn, T. H. & Co.—Straight, Pa. (White.)
Quick, Win T.—Big Rapids, Mich. (Northern.)

R.

- Raban-Johnston.**—34 Broad St., Port Chester, N. Y. (Reo, Premier.)
Rabenold, W. F.—28 N. 11th St., Allentown, Pa. (American, Berliet, Dolson, Dragon); garage; repairing.

- Radkey, S. B.**—Cor. W. 5th & Colorado Sts., Austin, Tex. (Holsman.)
Rae, G. & J. M.—106 Falls St., Niagara Falls, N. Y. (Ford.)
Rainier Agency.—559 7th Ave., Pittsburgh, Pa. (Rainier.)
Rainier Co.—Broadway & 50th St., New York City. (Rainier.)
Rainier Motor Car Co.—1725 Michigan Ave., Chicago, Ill. (Rainier.)
Ramalay, F. W.—St. Paul, Minn. (Rauch, & Lang.)
Rambler Auto Co.—101 Fulton St., Syracuse, N. Y. (Rambler.)
Rambler Auto Agency.—707 Pacific Ave., Tacoma, Wash. (Rambler.)
Rambler Automobile Co.—1506 Capitol Ave., Omaha, Neb. (Rambler.)
Ramsay, B. S.—Plattsburg, N. Y. (Waltham.)
Ramsey-Hutchins Co.—1048 S. Main St., Los Angeles, Cal. (Pierce-Racine.)
Rand & Harvey.—Elizabeth St., Lewiston, Me. (Stanley.)
Randall, A. G.—109 N. 11th St., Boise, Ida. (Buick, Waltham); garage; repairing.
Randall Co., Fred E.—245 Columbus Ave., Boston, Mass. (Stevens-Duryea, Pullman.)
Randall Motor Car Co.—216 Beny St., Fort Wayne, Ind. (Stoddard-Dayton, Mitchell, Ford, Rambler, Model.)
Randliff Motor Car Co.—893 Boylston St., Boston, Mass. (Panhard.)
Randolph, T.—Nyack, N. Y. (Holsman.)
Ranlett Automobile Co.—76 Eastern Ave., St. Johnsbury, Va. (Stanley.)
Ranney & Co., A. Elliott.—1851 Broadway, New York City. (Elmore); garage; repairing.
Rarig Auto & Garage Co.—466 20th St., Oakland, Cal. (Queen, National, Jackson.)
Rarig Auto & Garage Co.—538 Golden Gate Ave., San Francisco, Cal. (National.)
Ray, D. A.—Fosston, Minn. (Buick.)
Ray-Wortham Automobile Co.—609 Throckmorton St., Fort Worth, Tex. (Stoddard-Dayton.)
Read Bicycle Co.—Ave. D, bet. 12th and 13th Sts., Miami, Fla. (Indian.)
Reading Automobile Co.—26 S. Fifth St., Reading, Pa. (Peerless, Franklin, Buick, Oldsmobile, Pope-Waverley); garage; repairing.
Reading Auto Co.—Philadelphia, (Peerless.)
Reading Auto Garage.—Reading, 1 (Maxwell.)
Ream Bros. Auto Agency.—606-8 Broadway, Greenville, O. (Buick, Cadillac, Franklin, Knox, Packard, Walt' White.)
Reason & Son, Geo. W.—Pine Mich. (Maxwell, Reo, Cartercar.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Reber, C. D.**—Allentown, Pa. (Atlas.)
Reed-Underhill Co.—222 Columbus Ave., Boston, Mass. (Knox.)
Reed & Johnson.—109 W. Chicago St., Concord, Mich. (Reo.)
Reese, E. Shriver.—230 Euclid Ave., Cleveland, O. (Royal.)
Rees, H. O.—242 W. Commerce St., San Antonio, Tex. (Lambert.)
Reese, S., Machine & Tool Works.—Plymouth, Pa. (Lambert.)
Reeves, Burton.—Freeport, Ill. (Jewel.)
Reichert Auto Co.—Temple St., cor. George, New Haven, Conn. (Haynes, Waltham); garage; repairing; supplies.
Reich, Robt. A.—Broadway, Kansas City, Mo. (Merkel.)
Reidenbach, R. P.—Ashtabula, O. (Jackson.)
Reid, R. T.—Midland, Tex. (Mitchell.)
Reid, S. D.—Euclid Garage, Cleveland, O. (Dolson.)
Reilly, C. J.—Syracuse, Ind. (Waltham.)
Reinfried, C. J.—Manitowac, Wis. (Cameron.)
Reliable Auto Co.—7th St. and Pacific Ave., Tacoma, Wash. (Baker, Buick, Olds, Pope-Hartford, Pope-Toledo, Thomas.) Garage.
Reliance Machine Co.—40 S. Park Ave., Warren, O. (Maxwell, Reading Standard motorcycle.)
Reliance Electrical Works.—Astoria, Ore. (Waltham.)
Reliance Motor Car Co.—216 E. 3rd St., Cincinnati, O. (Maxwell.)
Remsen Mfg. Co., I. S.—754 Bedford Ave., Brooklyn, N. Y. (Locomotive.)
Renault Freres Selling Branch.—Broadway & 57th St., New York, N. Y. (Renault.)
Rendon-Y-Hermano, J.—Calle 63. No. 501, Merida, Yucatan, Mexico. (Franklin, Monarch, Cameron.)
Renfrew, S. S.—Harvey, N. D. (Buick.)
Renfro's Garage & Supply House.—Tonopah, Nev. (American.)
Reno Garage.—Cor. Lake & 2nd Sts., Reno, Nev. (Pope-Toledo, Franklin.)
Renst & Renst.—Junction City, Kan. (Ford.)
Reo & Williams Motor Car Co.—1032 Los Angeles, Cal. (Atlas,

- Frank O.**—424 Stanyan Francisco, Cal., and Oakland, Pullman, Pennsylvania); repairing.
Auto Co.—1634 Broadway, Denver, o. (Reo, Gale, Premier.)
Auto Co.—Walcott, N. Y. (Reo, emier.)

- Reo Garage.**—Riverside, Cal. (Reo.)
Reo Motor Agency.—100 York Square, New Haven, Conn. (Reo.)
Reo Motor Car Co.—1032 Euclid Ave., Cleveland, O. (Reo, Premier.)
Reo Motor Car Co.—289 Jefferson Ave., Detroit, Mich. (Reo.)
Reo Motor Car Co. of Philadelphia.—242 N. Broad St., Philadelphia, Pa. (Reo, Premier); repairing.
Reo Motors, Ltd.—Little George St., London, England. (Reo.)
Rhode, Claire.—Pine Village, Ind. (Haynes.)
Rettig, F. J.—Canal St., Wabash, Ind. (Lambert, Ford.)
Reyburn Motor Car Co.—4601 Olive St., St. Louis, Mo. (Stearns, Royal.)
Rhode Island Motor Car Co.—69 Broad St., Providence, R. I. (Pope-Hartford, Franklin.)
Rhoda, A.—Cooperstown, Griggs Co., N. Dak. (Mitchell.)
Rhodes, John F.—109 Church St., Elmira, N. Y. (Waltham, Jackson.)
Rhodes, Lewis F.—Phoenixville, Pa. (Simplicity.)
Rialto Automobile Co.—Fresno, Cal. (Winton.)
Rice, J. J.—Kramer, Ind. (Rambler.)
Rice, M. A.—Baltimore, Md. (Rauch & Lang.)
Richards, J. B.—2nd St., Ashland, O. (Ford, Jackson.)
Richardson Electric Co.—210 W. 1st St., Duluth, Minn. (Maxwell, Cadillac, Buick, Pope-Waverley, Reo, White.)
Richardson, J. R.—11th & West Sts., Wilmington, Del. (Rapid.)
Richardson, Lee.—Redlands, Cal. (Earl.)
Richardson Paper Co.—Lockland, O. (American Mercedes.)
Richards, W. E.—Weatherford, Texas. (Cadillac.)
Rich, H. M.—Morrisville, Vt. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Cadillac, Jackson.)
Richley, J. W.—29 S. Beaver St., York, Pa. (Cadillac, Franklin, Winton.)
Richmond-Jarvis Co.—13 Park St., Grand Rapids, Mich. (Jewel, Rambler, National.)
Richter, Robert H.—1421 Michigan Ave., Chicago, Ill. (Hotchkiss.)
Rickey Machine Co.—92 Eaton Place, East Orange, N. J. (Marmon.)
Riddell Automobile Co.—720 Locust St., Des Moines, Ia. (Buick, Cadillac, Franklin, Winton.)
Rietveld, H.—Pella, Iowa. (Waltham.)
Riggs, J. Dudley.—1118 Cathedral St., Baltimore, Md. (Simplex.)
Riggs Land Co.—Redfield, S. Dak. (Lambert.)
Riggs, T. D.—Hartford, Conn. (Isotta.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Mitchell Motor Car Co.—Paris, France. (Mitchell.)
Mitchell Motor Co. of New York.—1876 Broadway, New York City. (Mitchell.)
Mobile Auto Co.—Mobile, Ala. (Stoddard-Dayton.)
Mobile Carriage Co.—762 Golden Gate Ave., San Francisco, Cal. (Pierce Arrow, Knox.)
Model Machine Works.—E. Clinton St., Frankford, Ind. (Holsman.)
Moe, B. P.—Watertown, S. Dak. (Rambler.)
Mogenety, B. F.—Shreveport, La. (Cadillac.)
Mohawk Valley Auto Co.—Albany, N. Y. (Knox.)
Mohler & De Gress.—la Independencia 12, Mexico City, Mex. (Rapid, Thomas Flyer, Monarch, Dragon, Pierce Arrow, Stevens-Duryea.)
Momot & Sacher.—S. Market St., Canton, Ohio. (Rambler.)
Moise, E. W., Jr.—Sumter, S. C.—(Buick.)
Moliner, M. & J.—Buenos Ayres, S. A. (Holsman.)
Mongollon Motor Road Co.—Silver City, N. M. (Reo.)
Monnich, Bernard.—Dodge County Bank Bldg., Hooper, Neb. (Holsman.)
Monroe, John B.—Powellton, Ill. (Waltham.)
Montana Garage Co.—Butte, Mont. (Glide.)
Monte Cristo Garage.—New London, Conn. (Pullman.)
Montgomery Auto Co.—Montgomery, Ala. (Cadillac.)
Montgomery, H. C.—Shelbyville, Ind. (Haynes.)
Montonx, E.—Riverhead, Long Island, N. Y. (Maxwell.)
Monumental Garage, The.—1002 Morton St., Baltimore, Md. (Pungs-Finch; Maxwell); garage; repairing.
Moody, C. F.—Devil's Lake, N. Dak. (Buick.)
Moon Automobile Co.—461 Golden Gate Ave., San Francisco, Cal. (Moon.)
Moon, C. D.—Eau Claire, Wis. (Franklin.)
Moore, Babcock.—429 Wabash Ave., Chicago, Ill. (Reliance.)
Moore Auto Co.—Lincoln, Neb. (Monarch.)
Moore Auto Co.—571 Fifth Ave., New York City. (Moore.)
Moore Automobile Co.—Walla Walla, Wash. (Franklin.)
Moore, Edenfield Elec. & Mfg. Co.—1033 Broad St., Augusta, Ga. (Franklin, Cadillac); garage; repairing.
Moore, E. E.—Middlesex Square, Marlboro, Mass. (Lambert.)

Moore, F. C.—San Bernardino, Cal. (Maxwell.)
Moore Fuel & Feed Co.—Bisbee, Ariz. (Maxwell.)
Moore, J. G.—809 Euclid Ave., Cleveland, O. (Dolson.)
Moore, Harry S.—1761 Crawford Road, garage; repairing.
Mora Motor Car Co.—1218 Michigan Ave., Chicago, Ill. (Mora.)
Mora Motor Car Co.—52nd St. and Broadway, New York City. (Mora.)
More Bros.—Wimbledon, N. Dak. (Lambert.)
Morfin, Carlos.—Agnas Calientes, Mex. (Wayne.)
Morgan & Co., Henry.—Montreal, Canada. (Maxwell, Daimler.)
Moriarty & Co., E. P.—1612-14 Grand Ave., Kansas City, Mo. (Packard, Stevens-Duryea); garage; repair cars represented.
Morley, Jas. F.—220½ S. Spring St., Los Angeles, Cal. (Royal, Coppock.)
Morrill Motor Car Co., E. C.—5 Raitts Court, Portsmouth, N. H. (Premier.)
Morris, R. H.—1818-1820 Telegraph Ave., Oakland, Cal. (Pope-Waverley.)
Morris, A.—Columbus Grove, O. (Cadillac, Buick, Franklin); garage; repairing.
Morris Bros. Automobile Co.—149 E. 4th St., Plainfield, N. J. (Holsman, Ford, Maxwell.)
Morrison Auto Agency.—3916 Washington St., St. Louis, Mo. (Welch.)
Morrison & Price Co.—169 Huntington Ave., Boston, Mass. (Rainier.)
Morrison Co., A. E.—93 Massachusetts Ave., Boston Mass. (Stearns, Oldsmobile.)
Morrison, C. H.—603 Kansas Ave., Topeka, Kan. (Studebaker.)
Morrison, George H.—Grand Rapids, Mich. (Waltham.)
Morrissey's Automobile Station.—Pine & Shamrock Sts., Stockbridge, Mass. (Rambler.)
Morrow & Bretthauer.—John & North Sts., Middletown, N. Y. (Rambler, Ford, Frontenac.)
Morrow-Thomas Hardware Co.—Amarillo, Tex. (Northern.)
Morse, I. J.—245 N. Broad St., Philadelphia, Pa. (Locomobile.)
Mortland Automobile Co.—12th & Oak Sts., Oakland, Cal. (Glide.)
Morton, R. E. L.—Hanford, Cal. well.)
Mosehart & Keller Co.—Houston (Buick.)
Moshier, Frank P. Jr.—Greenwich, (Ford.)
Moseley, O.—Peru, Ind. (Holsman.)
Mosley Haigler Electric Co.—Montgomery, Ala. Stoddard-Dayton.)
Motobloc Agency.—244 W. 69th New York City. (Motobloc.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Motor Car Agencies.—445-49 Golden Gate Ave., San Francisco, Cal. (Wayne, Moon, Logan, Renault, Johnson.)

Motor Car Co.—Mt. Royal & Maryland Aves., Baltimore, Md. (Peerless, Thomas Flyer, Stanley, Baker, Waltham, Knox, Stevens-Duryea.)

Motor Car Co.—1314 New York Ave, Washington, D. C. (Thomas Flyer, Peerless, Stevens-Duryea.)

Motor Car Co. of New Jersey.—291 Halsey St., Newark, N. J. (Cadillac, Northern, Autocar, Packard); garage; repairing; electric charging; supplies.

Motor Car Repair Co.—408 Orange St., Wilmington, Del. (Maxwell.)

Motor Cycle Specialty Co.—258 Columbus Ave., Boston, Mass. (Indian.)

Motor Livery Co.—249 3rd Ave., South Minneapolis, Minn. (Dragon.)

Motor Sales Co.—251 Jefferson Ave., Detroit, Mich. (De Luxe, Queen.)

Motor Sales Co.—1771 Broadway, New York City. (De Luxe.)

Motor Shop.—317 N. Broad St., Philadelphia, Pa. (Oldsmobile, Stearns.)

Motor Tavern.—Cor. Main & Front Sts., Findlay, O. (Cadillac, Franklin.)

Motor Traction Co.—323 Delta Ave., Clarksdale, Miss. (Lambert.)

Motor Transfer Co.—Richmond, Va. (Buick, Matheson, Franklin, Cadillac.)

Motor Vehicle Co.—Mulberry & Crescent Sts., Harrisburg, Pa. (Atlas, Jackson, Cameron, Ford.)

Motter, Chas. E.—York, Pa. (Stanley.)

Mount & Bros., J. W.—Maple Ave. & White St., Red Bank, N. J. (Cadillac, Maxwell.)

Mt. Diablo Garage.—Cor. Fernando & Colfax Sts., Concord, Cal. (Rambler); garage; repairing.

Mt. Vernon Motor Co.—1118 Cathedral St., Baltimore, Md. (Autocar, Haynes, Panhard, Mercedes, Isotta.)

Mueller, L. J.—6417 Woodland Ave., Cleveland, O. (Indian, Merkel.)

Muller, Cahoon Co.—Salt Lake City, Utah. (Pope-Waverley.)

Mulken, J. T.—Trappe, Md. (Cadillac.)

Mulock's Belmont Garage.—13 & 15 S. Carolina Ave., Atlantic City, N. J. (Buick, Rambler, Pullman); garage; repairing.

Murphy, John B.—Powellton, Ill. (Waltham.)

Murphy, A. H.—918 State St., Erie, Pa. (Pope-Toledo, Rauch & Lang, Elmore.)

Murphy & Cooley.—Hartford City, Ind. (National.)

Murphy Bros.—22 Park Row, Erie, Pa. (Franklin, Winton, Thomas Flyer.)

Muskegon Bicycle & Auto Co.—18-20 Clay Ave., Muskegon, Mich. (Rambler, Maxwell.)

Mutual Elec. Co.—Duluth, Minn. (Pope-Toledo.)

Mutual Electric Co.—Kokomo, Ind. (Haynes, Pope-Waverley.)

Mutual Supply Co.—2210 Farnam St., Omaha, Neb. (Monarch.)

Myers, Fred, Sr.—Redfield, S. Dak. (Cadillac.)

N

Nadig Mfg. Co., Chas. H.—N. 4th St., Allentown, Pa. (Waltham.)

Nado, Lewis A.—Danielson, Conn. (Rambler.)

Nalle, Ewell.—601 E. 6th St., Austin, Tex. (Thomas, Buick); repair cars represented.

Napier, Geo. R.—Macon, Ga. (Maxwell.)

Nash, J. H.—Orona, Me. (Ford.)

Nash, W. B.—Machias, Me. (Waltham.)

Nashville Motor Car Co.—9th Ave., & Church St., Nashville, Tenn. (Ford, Dorris.)

National Auto & Supply Co.—Cor. Duke & Vail Sts., Lancaster, Pa. (Rambler, Crawford, Marmon.)

National Auto Co.—New Orleans, La. (Monarch.)

National Auto Co.—1711 14th St., Washington, D. C. (Oldsmobile, Studebaker.)

National Motor Car Co.—957 S. Main St., Los Angeles, Cal. (National, Triumph, Pierce-Racine, F. N. Motorcycle.)

National Motor Car Co.—Oakland, Cal. (Chadwick, Jackson, National, Queen.)

National Supply Co.—Philadelphia, Pa. (Waltham.)

Neakes Bros.—Corpus Christi, Tex. (Cadillac.)

Neal & Clark & Neal Co.—643 Main St., Buffalo, N. Y. (Indian, Reliance.)

Neeley, N. A.—Christchurch, New Zealand. (Wayne.)

Negley, Charles.—Farmington, Ill. (Buick.)

Neiheisel Bros.—Boulder, Colo. (White, Smith, Autocar, Franklin, Jackson, Ford.)

Nelms, Robert.—42 W. Adams St., Jacksonville, Fla. (Queen.)

Nelson Auto Co.—216 Main St., Springfield, Mass. (Buick.)

Nelson, E. R.—Ishpeming, Mich. (Franklin.)

Nelson House Garage.—34 Market St., Poughkeepsie, N. Y. (Maxwell.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Nelson & Co., J. A.—Round Rock, Tex. (Mitchell.)
Nelson, W. H.—Smith Center, Kan. (Waltham.)
Nettleton & Co., V. L.—21 Hanchett St., Coldwater, Mich. (Rambler, Maxwell); garage; repairing.
Neubling, John G.—8843 Penn Ave., Reading, Pa. (Indian.)
Neuman & Co., Wm. F. V.—736 Woodward Ave., Detroit, Mich. (Wayne, Pope-Waverley, Stoddard-Dayton, Welch, White, Soules, Baker.)
Nevada Automobile & Supply Co.—N. Main St., Goldfield, Nev. (Office, 115 Ramsey St., Goldfield, Nev. (Pope-Toledo, Northern); garage; repairing.
Neville & Co.—Oshkosh, Wis. (Pope-Toledo.)
Nevin, Ernest D.—507 Wood Ave., Pittsburgh, Pa. (Darracq.)
New Amsterdam Motor Car Co.—Brooklyn, N. Y. (Crawford.)
New Amsterdam Motor Co.—152 W. 86th St., New York City. (Crawford.)
Newark Motor Car Co.—126-128 S. 14th St., Newark, N. J. (Wayne, Reo, Premier.)
Newburn, J. R.—Union City, Ind. (Northern.)
Newburg Auto Shop.—249 Grand St., Newburg, N. Y. (Winton); garage; repairs.
Newby's Auto Inn.—1122 W. Broad St., New Castle, Ind. (Maxwell, Premier, National, Rambler.)
New Castle Auto Co.—27 Cockram St., New Castle, Pa. (Pope-Toledo.)
Newcomb Auto Co.—Wildwood, N. J. (Cadillac.)
New Columbia Machine Works.—239 Pearl St., Fort Wayne, Ind. (Kiblinger.)
Newcomb, F. S.—Post Hill, New London, Conn. (Maxwell.)
Newell, C. H.—Coldwater, Mich. (Waltham.)
Newell, Jas. R.—819 Hay St., Wilkesburg, Pa. (Elmore.)
New England Auto Co.—55 Berkeley St., Boston, Mass., and 26 Market Sq., Providence, R. I. (Second-hand cars.)
New Haven Auto Corp.—53 Broadway, New Haven, Conn. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
New Era Co.—56 Galen St., Watertown, Mass. (Glide.)
New Jersey Automobile Co.—855 Springfield Ave., Newark, N. J. (Moline); garage; repairing.
New Jersey Motor Co.—49-51 Bank St., Newark, N. J. (Ford.)
Newlin, W. G.—128 Pipestone St., Benton Harbor, Mich. (Rambler.)

New London Auto Station.—New London, Conn. (Thomas Flyer, Thomas Detroit, Haynes); garage; repairing.
Newman Investment Co.—El Paso, Tex. (Buick.)
Newman, J. E.—1841 Market St., San Francisco, Cal. (Rapid.)
Newman, O. H.—Belmar, N. J. (Maxwell.)
Newmarch, L. A.—Sidney, New South Wales, (Lambert.)
Newton, J. E.—Bedford & Troy Sts., Fall River, Mass. (Stevens-Duryea.)
New York Auto Co.—State & Lafayette Sts., Utica, N. Y. (Reo.)
New York Motor Car Co.—231 W. 40th St., New York City. (Atlas Trucks.)
New York Transportation Co.—49th St. and 8th Ave., New York City. (Columbia cars and Exide batteries.) Rental service; garages at 19 Downing St., Newport, R. I.; and 66th St. and 3rd Ave., 27th St. and 9th Ave., Bayard St. and Bowery, New York City.
Niagara Falls Auto Transit Co.—103 Maine St., Niagara Falls, N. Y. (Cadillac, Winton); garage; repairing; supplies.)
Nickerson Co., F. A.—642 Congress St., Portland, Me. (Pierce Arrow.)
Nickerson, Ed.—Bourne, Mass. (Waltham.)
Nichols & Co., D. P.—220 Eliot St., Boston, Mass. (Frayer-Miller.)
Nicholas, J. Hervey.—1636 Broadway, Denver, Col. (Winton.)
Nichols, Scott D.—Federal & Front Sts., Troy, N. Y. (Ford, Premier, Maxwell, Rambler.)
Nipp, Chas. F.—Mimwhia, Iowa. (Waltham.)
Noakes Bros.—Corpus Christi, Tex. (Buick.)
Neck Auto Co.—141 Dyer St., Providence, R. I. (Stoddard-Dayton.)
Noonan Tool & Machine Works.—Rome, N. Y. (Rambler.)
Norbeck & Nicholson.—Redfield, N. D. (Maxwell.)
Norcross Auto Co.—43 Foster St., Worcester, Mass. (Buick.)
Norcross Cameron Co.—57 Bridge St., Springfield, Mass. (Rambler, Corbin, Ford); garage; supplies.
Norris Automobile Co.—Genesee Ave., Saginaw, Mich. (Buick, Oldsmobile, Woods, Cadillac)
Northern Auto Co.—4 _____ Ave., San Francisco. (_____)
Northern Auto Co.—14 _____ Chicago, Ill. (Peerle
Northern Automobile _____ Square, Motor Mart, Boston, (Northern); repairing.
Northampton Garage.—Northa _____ Mass. (Atlas.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

North Jersey Auto & Eng. Co., Inc.—Hackensack, N.J. (Mercedes, Winton.)
North Shore Auto Garage.—250 Harrison St., North Evanston, Ill. (Buick.)
Northway, Thomas J.—92 Exchange St., Rochester, N. Y. (Rainier, Rambler, Ford, White, Reo.)
Northwestern Auto Co.—Aberdeen, S. Dak. (Cadillac.)
Northwestern Cadillac Co.—316-322 4th Ave., Minneapolis, Minn. (Cadillac, Pope-Waverley.)
Northwestern Motor Car Co.—1928-30 N. 20th St., Philadelphia, Pa. (Moline); garage; repairing.
Northwestern Motor Co.—Broadway and Union St., Seattle, Wash. (White, Columbus.)
Norton Auto Co., S. E.—14 E. 1st St., La Junta, Colo. (Waltham.)
Nourse, F. R.—Louiston, Ida. (Holsman.)
Noyes, H. G.—Gorham, N. H. (Jackson.)
Nute & Keena.—Seattle, Wash. (Packard.)
Nutzel, Fred.—1108 S. 5th St., La Crosse, Wis. (Rambler.)
Nyack Auto Garage.—68 Burd St., Nyack, N. Y. (Maxwell.)
Nyberg, P. J.—Yankton, S. Dak. (Cadillac.)
Nye, John.—Salt Lake City, Utah. (Waltham.)

O

Oathout, Chas. W.—160 Broad St., Newark, N. J. (Jackson.)
O'Brien, M. R.—22 Wood Ave., Providence, R. I. (Dolson.)
Occident Motor Car Co.—2731 W. Pico St., Los Angeles, Cal. (Cartercar.)
Oden Auto Co., J. P.—26 W. Philadelphia St., York, Pa. (Mitchell.)
Offenbacher, A. B.—525 3rd St., Marietta, O. (Pope-Waverley.)
Ogden, D.—332 5th St., Columbus, Ind. (Reo, Jackson, Wayne, Haynes); garage; repairs.
Ohio Motor Car Co.—2142 E. 9th St., Cleveland, O. (Buick, Columbia, Waltham, Haynes.)
Ohio Pail Co.—Middlefield, O. (Monarch.)
Ohio Valley Auto Co.—Greenup, Ky. (Rambler); repairing.
Ohler, J. O.—Lima, O. (Mitchell.)
Ohmacht, L. W.—Cresco, Ia. (Holsman.)
Olmsted & Son, H. R.—413 S. Clinton St., Syracuse, N. Y. (Indian.)
Ohnhaus Automobile Co.—219 Pearl St., Fort Wayne, Ind. (Buick, Jackson, Oldsmobile.)
Okado Bros.—Osaka, Japan. (Monarch.)

Oklahoma Automobile Co.—806 Broadway, Enid, Okla. (Cadillac, American.)
Oklahoma Motor Car Co.—515 W. Main St., Oklahoma City, Okla. (Rambler, Ford, Pope-Waverley, Reliance, Mason, American.)
Olds, Arthur L.—Charles City, Iowa. (Jackson.)
Olds, H. B.—315 Columbia St., Fort Wayne, Ind. (Stearns.)
Oldsmobile Co.—1010 Prospect Ave., Cleveland, O. (Oldsmobile.)
Oldsmobile Co.—1328 Michigan Ave., Chicago, Ill. (Oldsmobile.)
Oldsmobile Co.—1653 Broadway, New York. (Oldsmobile.)
Olewine, B. J.—Newcastle, Brunswick, Ga. (Pope-Hartford.)
Oliver & Kemp.—West Pike St., Pontiac, Mich. (Jackson, Maxwell.)
Oliver, S. C.—29 W. Forsythe St., Jacksonville, Fla. (Ford.)
Olsen, Oscar L.—Lincoln, Neb. (Waltham.)
O'Neill & Bros., A. A.—City Hall Ave. & Randolph St., Norfolk, Va. (Rambler.)
O'Neill's Auto Station.—574 Common St., Lawrence, Mass. (Premier, Ford.)
Oneonta Automobile Garage.—23 Dietz St., Oneonta, N. Y. (Haynes, Waltham, Oldsmobile.)
Onondaga Garage.—54 S. Clinton St., Syracuse, N. Y. (Pope-Hartford.)
Opp's Hardware Co.—Otterbein, Ind. (Lambert.)
Orange Auto Garage.—Essex Ave. & R. R. Pl., Orange, N. J. (Franklin, Pope-Hartford, Pope-Toledo.)
Orange Valley Garage.—948 Main St., Riverside, Cal. (Reo, Jackson, Royal.)
Orient Buckboard Supply Co.—110 Park St., Albion, Mich. (Waltham.)
Orlando-Kessler Auto Co.—36 W. Capitol St., Columbus, O. (Lozier.)
Ormond Automobile Co.—2 Jefferson Ave., Brooklyn, N. Y. (Columbia.)
Ormond Beach Garage.—Ormond, Fla. (Cadillac.)
Osborn, C. H.—405 S. Superior St., Albion, Mich. (Rambler, Waltham, Queen.)
Osburn Iron Works.—Redlands, Cal. (Royal); garage; repairing.
Osburn's Sons, J. F.—Clarksburg, W. Va. (Cadillac.)
Osen-Hunter Auto Co.—50 W. St. John St., San Jose, Cal. (Mitchell.)
Osen-Hunter Automobile Co.—407 Golden Gate Ave., San Francisco, Cal. (Mitchell.)
Ostlunds Garage & Machine Shop.—1320 4th Ave., Moline, Ill. (Maxwell.)
Outcalt Mfg. Co.—Spotswood, N. J. (Dragon.)
Overland Motor Car Co.—1333 Broadway, Denver, Colo. (Cartercar.)

**AUTOMOBILE AGENTS AND
DEALERS (Continued)**

- Overs, C. E.**—2nd St., Ashland, O. (Ford, Mitchell.)
Overton, L. W.—Traveler St., Southhold, N. Y. (Waltham.)
Ovington Mfg. Co.—2208 Broadway, New York City. (F. N. Motorcycle.)
Owen & Co., R. M.—Lansing, Mich. (Reo.)
Owen & Co., R. M.—1344 Michigan Ave., Chicago, Ill. (Reo, Premier.)
Owen & Co., R. M.—1659 Broadway, New York, N. Y. (Reo, Premier.)
Owen, H. F.—Delaware, O. (Cameron.)
Owen, Inc., Percy.—62nd St. and Broadway, New York City. (Bianchi.) Repairing cars represented.
Owensboro Auto Co., Inc.—Frederica and 4th Sts., Owensboro, Ky. (Columbia, Ford.)
Owen, Thos. G.—379 Franklin St., Newport, R. I. (Rambler.)
Oxford Auto Station.—Lynn, Mass. (Winton.)

P

- Pacific Automobile Co.**—1028 S. Main St., Los Angeles, Cal. (De Luxe, Queen, Overland.)
Pacific Coast Automobile Co.—Seattle, Wash. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Thomas Flyer, Thomas Detroit, Buick, Oldsmobile); garage; repairing.
Pacific Commercial Car Co.—Seattle, Wash. (Cartercar.)
Pacific Commercial Car Co.—8th and Pacific Aves., Tacoma, Wash. (Cartercar, Lambert.)
Pacific Motor Car Co.—1416 Broadway, Oakland, Cal. (Stevens-Duryea.)
Pacific Motor Car Co.—376 Golden Gate Ave., San Francisco, Cal. (Packard, Stevens-Duryea, Woods.)
Packard, J. E.—Augusta, Me. (Cadillac.)
Packard Motor Car Co.—Broadway & 61st St., New York City. (Packard); garage.
Paddock, N. H.—Holdredge, Neb. (Maxwell.)
Padgett, J. M.—Topeka, Kan. (Pope-Waverley.)
Page & Co., Carl.—Newark, N. J., and Bridgeport, Conn. (Peerless.)
Page & Co., W. A.—220 Elliott St., Boston, Mass. (Simplicity.)
Pagel, Dr. C. M.—St. Paul, Minn. (Holsman.)
Paige, E. W.—46 Washington Ave., Batavia, N. Y. (Ford.)
Paige, M. M.—302 Highland Drive, Seattle, Wash. (Lambert.)
Paige, Walter M.—131 Cass St., Traverse City, Mich. (Maxwell.)
Painter, G. W.—Winston, N. C. (Buick.)

- Palace Auto Co.**—1408-1410 Walnut St., Kansas City, Mo. (Pierce Arrow, Oldsmobile, Columbia); garage; repairing.
Palace Auto Station Co.—348 Trumbull St., Hartford, Conn. (Thomas Flyer, Autocar, Oldsmobile); garage.
Palace Automobile Station.—32 Hermon St., Worcester, Mass. (Rambler); garage; repairing.
Palace Garage.—540 Washington St., Camden, N. J. (Cadillac, Autocar.)
Palais de l'Automobile.—Broadway and 57th St., New York City. (Delaunay-Belleville, Panhard, Renault.)
Palis, F. W.—Spring St., Shreveport, La. (Buick, Jewel, Stoddard-Dayton.)
Palisade Auto Co.—Palisade Ave. and Hackensack Plank Rd., Weehawken, N. J. (Cadillac, Peerless, Pope-Hartford, Pope-Waverley.)
Palmer & Peck.—Oakland, Cal. (Auburn.)
Palmer & Singer Mfg. Co.—1620-1624 Broadway, New York City. (Simplex, Isotta Fraschini, P. & S.) Garage and repairing.
Palmer & Singer Mfg. Co. of New York.—1321 Michigan Ave., Chicago, Ill. (Simplex, Isotta Franchini, P. & S.)
Palmer. Auto Garage.—Palmer, Mass. (Olds.)
Palmer, Frank.—40-50 Jefferson Ave., Battle Creek, Mich. (Reo); garage; repairs; supplies.
Palo Alto Hardware & Improvement Co.—Emmetsburg, Ia. (Waltham.)
Panhard & Levassor.—222 Elliott St., Boston, Mass. (Panhard.)
Panhard & Levassor.—Broadway and 62d St., New York City. (Panhard.)
Pape, Otto.—Berlin, Germany. (Pope-Toledo.)
Pardee & Canary, Inc.—1218 Michigan Ave., Chicago, Ill. (Mors, Renault, Mora.)
Paris Foundry & Machine Works.—Paris, Ill. (Buick, Waltham.)
Parker & Co., F. R.—288 Columbus Ave., Boston, Mass. (Elmore.)
Park Automobile Co.—2359 Madison Ave., Baltimore, Md. (Frayser-Miller.)
Park Automobile Co.—4432 Olive St., St. Louis, Mo. (Thomas Flyer, Baker, Autocar.)
Parker, F. H.—Gardner, Mass. (Maxwell.)
Parker & Co., F. R.—228 Columbus Ave., Boston, Mass. (Elmore)
Parker & Co., F. R.—Concor (Cadillac.)
Parker Co., J. P.—46-48 S. Second Memphis, Tenn. (Stoddard-Dayton)
Parker, David L., Co.—Auto Station Market St., New Bedford, M (Pope-Toledo, Pope-Hartford); age; repairing; supplies.
Parker, Robert.—Remington, Ind (Waltham.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Parkersburg Auto Co.**—607 Julian St., Parkersburg, W. Va. (White, Pope-Waverley.)
- Parker, Wm. A.**—1a Independencia 12, Mexico City, Mexico. (Elmore.)
- Park Garage.**—425 Main St., Chico, Cal. (Ford, Rambler.)
- Park Garage.**—Brooklyn, N. Y. (Walter.)
- Park Garage Co.**—210 W. Ohio St., Allegheny, Pa. (Walter, Corbin.)
- Park Hardware Co.**—Warren, Ohio. (Jewel.)
- Park, J. W.**—Fruit Land, Fla. (Carter-car.)
- Parkes, E. T.**—Fidelity Bldg., Buffalo, N. Y. (Autocar.)
- Parks, A. S.**—Wichita, Kan. (Locomobile.)
- Park Square Auto Station.**—43 Columbus Ave., Boston, Mass. (Stoddard-Dayton, Berliet); garage; repairing.
- Parsons, F. G.**—500 Main St., Stamford, Conn. (Waltham.)
- Parsons, J. C.**—410 N. Main St., Rushville, Ind. (Cameron.)
- Passaic Motor Car Co.**—147 Main Ave., Passaic, N. J. (Pope-Waverley.)
- Pastre Ellis Automobile Garage.**—Ocean Parkway, Brooklyn, N. Y. (National, Rambler.)
- Paterson Auto Exchange.**—10 Crosby Place, Paterson, N. J. (Cadillac, Haynes, Franklin.)
- Paterson, Geo. S.**—254 Euclid Ave., Cleveland, O. (Reo, Premier.)
- Paterson, James.**—Red Cloud, Neb. (Mitchell.)
- Paterson Vehicle Co.**—257 Market St., Paterson, N. J. (Jackson.)
- Patnot, A. F.**—Hanford, Cal. (Pope.)
- Patten, W. N.**—Honolulu, Hawaiian Islands. (Waltham.)
- Patterson, F. H.**—Fredonia, Kan. (Waltham.)
- Paulman & Co., H.**—1430 Michigan Ave., Chicago, Ill. (Pierce Arrow.)
- Pawler, P.**—Calumet, Mich. (Wayne.)
- Pawtucket Auto Co.**—4 Mason St., Pawtucket, R. I. (Winton, Cadillac, Studebaker, Oldsmobile, Maxwell.)
- Payne, John R. Co., Inc.**—Albany, N. Y. (Stearns.)
- Auto Repair Garage.**—161 Main St., Passaic, N. J. (Reo, Premier.)
- on, Warren.**—Troy, Ohio. (Waltham.)
- Anderson.**—Greenburg, Ind. (.)
- White.**—Anawan St., Fall River, ss. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- & White.**—Weir St., Taunton, ss. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

- Peck, C. S.**—Shelbyville, Ind. (Cadillac.)
- Peckham Carriage Co.**—19 S. Kenton St., Dayton, O. (Buick, Cadillac, White.)
- Peckham, F. W., Motor Syndicate.**—40 Sackville St., Picadilly, London, England. (Maxwell.)
- Pecos Auto Co.**—Pecos, Tex. (Acme.)
- Pedigo, R. E.**—Lucus, Iowa. (Waltham.)
- Peerless Garage.**—942-944 Bedford Ave., Brooklyn, N. Y. (Peerless); garage; repairing.
- Peerless Garage Co.**—Union Bldg., Newark, N. J. (Peerless.)
- Peerless Motor Car Co. of N. E.**—178 Columbus Ave., Boston, Mass. (Peerless); garage; repairing.
- Peerless Motor Car Co.**—220 W. 41st St., New York City. (Peerless); garage; repairing.
- Pegues, P. T.**—Imperial Hotel, Dallas, Tex. (Lambert.)
- Pelton, Chas E.**—7 Shady Ave., Knoxville, N. Y. (Knox.)
- Pelton Grissel Auto Co.**—Fresno, Cal. (Maxwell.)
- Pence Automobile Co.**—717 Hennepin Ave., Minneapolis, Minn. (Buick, Packard, Pierce Arrow, Stevens-Duryea, Waltham, Pope-Toledo.)
- Pendleton, W. H. E.**—7th and Grand Ave., Los Angeles, Cal. (Austin.)
- Penn Automobile Co.**—31 Wood St., Reading, Pa. (Thomas Flyer.)
- Penn Auto Co.**—Pittsburg, Pa. (Crawford, Marmon.)
- Penn Motor Car Co.**—680 N. Broad St., Philadelphia, Pa. (Mitchell.)
- Pennsylvania Auto Agency.**—7 Motor Mart, Park Square, Boston, Mass. (Pennsylvania, Pullman, Northern); repairing.
- Pennsylvania Auto Co.**—2234 Broadway, N. Y. City. (Pennsylvania.)
- Pennsylvania Automobile Co.**—Hay St. & Kelly Ave., Wilkesburg, Pa. (Crawford, Marmon.)
- Peoria Auto Co.**—711 Main St., Peoria, Ill. (Pope-Toledo, Pope-Waverley, Cadillac, Franklin.)
- Peper Automobile Co.**—3922 Olive St., St. Louis, Mo. (American, Maxwell.)
- Percival, E. W., Jr.**—Fayetteville, N. C. (Waltham.)
- Peretti & Co.**—Florence, Italy. (Dragon.)
- Perkins & Corliss.**—65 Middle St., cor. Center St., Gloucester, Mass. (Maxwell, Rambler); repairs; supplies.
- Perkins & Corliss.**—Manchester, Mass. (Maxwell, Stevens-Duryea.)
- Perkins Auto Garage.**—Main St., Rockaway, N. J. (Corbin); garage; repairing.
- Perkins, B. B.**—St. Albans, Vt. (Cadillac, Franklin); garage; repairing.

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Perkins, B. C.**—504 Tchonpitolins Ave., New Orleans, La. (Apperson.)
- Perkins, F. H.**—White River Junction, Vt. (Cadillac, Stanley.)
- Perry, F. R.**—851 Whitney Ave., New Haven, Conn. (Jackson.)
- Perry, F. W.**—21 Court St., Taunton, Mass. (Maxwell.)
- Peters & Kittell.**—Cass & Union Sts., Hornell, N. Y. (Rambler.)
- Petern Bros.**—Millard, Neb. (Rambler.)
- Peterson, A. W.**—320 W. 3rd St., Davenport, Iowa. (Monarch.)
- Peterson, N. E.**—1520 Belmont Ave. Seattle, Wash. (Stearns.)
- Petersen, Dr. W. A.**—Elgin, Neb. (Holsman.)
- Petrie, Harrington & Co.**—Madison, Wis. (Rambler.)
- Pettis & Bolton.**—427 S. Saginaw St., Flint, Mich. (Ford.)
- Pettier, W.**—Fort Wayne, Ind. (Pope-Toledo.)
- Pfeffer, T. S.**—York, Pa. (Jewel.)
- Pfizenmayer, C. A.**—Duncan Hall, New Haven, Conn. (Winton.)
- Pfutz, D. G.**—N. Second St., Chambersburg, Pa. (Franklin, Cadillac, Pope.)
- Phelps, G. H.**—38 Central St., Worcester, Mass. (Corbin.)
- Philadelphia Auto Co.**—338 N. Broad St., Philadelphia, Pa. (Apperson.)
- Philadelphia Auto Sales Co.**—Philadelphia, Pa. (Jewel, Reliance, Dolson.)
- Philadelphia Motor Car Co.**—236 N. Broad St., Philadelphia, Pa. (Frayer-Miller.)
- Phillips & Wrinch, Ltd.**—76 Bay St., Toronto, Canada. (Mitchell.)
- Phillips, S. M.**—Sacramento, Cal. (Auto-car, Columbia.)
- Phil-Penn Motor Co.**—206 Drexel Bldg., Philadelphia, Pa. (Frayer-Miller.)
- Phoenix Light & Fuel Co.**—Phoenix, Ariz. (Cadillac.)
- Pickering Hardware Co.**—Cincinnati, O. (Indian.)
- Piedmont Motor Car Co.**—88 N. Pryor St., Atlanta, Ga. (Pope-Waverley, Marmon.)
- Pierce, A. L.**—Wallingford, Conn. (Waltham.)
- Pierce & Holson.**—Triscott, Kan. (Waltham.)
- Pierce & Isbell.**—1413 Michigan Ave., Chicago, Ill. (Baker.)
- Pierce Auto Co.**—109 S. State St., Syracuse, N. Y. (Oldsmobile.)
- Pierce Co., Geo. N., The.**—762 Golden Gate Ave., San Francisco, Cal. (Pierce Arrow.)
- Pierce Co., Geo. N., The.**—752 Main St., City Sales Department, Buffalo, N. Y. (Pierce Arrow.)
- Pierce Engine Co.**—1421 Michigan Ave., Chicago, Ill. (Pierce-Racine.)
- Pierce Engine Co.**—2200 Clark St., Racine, Wis. (Pierce-Racine.)
- Pierce Hardware Co., The.**—Taunton, Mass. (Waltham.)
- Pierre, Bremond.**—107 E. 6th St., Austin, Tex. (Haynes.)
- Pierson, Roy.**—Janesville, Wis. (Maxwell.)
- Pilling, A. J.**—Locust St. and Beach Rd., Winthrop, Mass. (Waltham.)
- Pilot Garage & Supply Co.**—185 Commercial St., Worcester, Mass. (Pope-Hartford, Pope-Toledo.)
- Pindar, W. J.**—Middleburgh, N. Y. (Mitchell.)
- Pingrey, C. H.**—Eddy Bldg., Bloomington, Ill. (Reo.)
- Pinkerton, W. A.**—Aberdeen, S. Dak. (Cartercar.)
- Pinn, W. T.**—Michigan City, Ind. (Waltham.)
- Pioneer Auto Co.**—Long Beach, Cal. (Rambler.)
- Pioneer Auto Co.**—Tucson, Ariz. (Buick.)
- Pioneer Auto Co.**—901 Golden Gate Ave., San Francisco, Cal. (Isotta-Fraschini, Mercedes, Olds, Panhard, Simplex, Thomas-Detroit, Thomas Flyer, Winton.)
- Pioneer Automobile Co.**—520-534 20th St., Oakland, Cal. (Winton, Thomas, Oldsmobile); garage; repairing.
- Pioneer Automobile Co.**—Benton Harbor, Mich. (Franklin.)
- Pioneer Garage.**—420 4th St., Eureka, Cal. (Mitchell.)
- Piper, L. W.**—310 Main St., Stroudsburg, Pa. (Dragon.)
- Pitman & Nelson Auto Co.**—491 Golden Gate Ave., San Francisco, Cal. (Page Adrian.)
- Pitman & Nelson Auto Co.**—2036 Addison St., Berkeley, Cal. (Page-Adrian); repairing; garage.
- Pitts & Wiseley.**—Roswell, New Mexico. (Lambert.)
- Pittsburgh Automobile Co.**—Pittsburgh, Kan. (Pungs-Finch.)
- Pittsburgh Auto Co.**—2213 Farmers' Bank Bldg., Pittsburg, Pa. (Thomas Flyer.)
- Pittsfield Auto Garage Co.**—228 North St., Pittsfield, Mass. (Rambler, Berkshire); garage; repair.
- Pixley, O. C.**—Des Moines Co., Des Moines, Iowa. (Reo.)
- Placek, F. A.**—Milliam, N. Y. (Reo.)
- Plainfield Motor Car**—Plainfield, N. J. (Mitchell)
- Plank, A. E.**—Quincy, Ill. (Reo.)
- Plaza Automobile Co.**—918 Union Brooklyn, N. Y. (Reo, Premier); second-hand cars.

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Pletcher, M. H.**—Harrisburg, Pa. (Monarch.)
- Pollard, Dr. James.**—Farmington, Ill. (Jackson.)
- Pollard Auto Station.**—230 Main St., Nashua, N. H. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, Cadillac); garage; repairing.
- Polhill, John H.**—Fitzgerald, Ga. (Pope-Hartford.)
- Pomeroy, S. G.**—West Lebanon, Ind. (Waltham.)
- Pomona Garage Co.**—Pomona, Cal. (Reo.)
- Pon & Whitley.**—Columbus, Ga. (Buick, Cadillac.)
- Pond Machine & Foundry Co., L. H.**—186 Main St., Worcester, Mass. (Premier, Reo, Maxwell, Ford, Pope-Waverley, Mercedes.)
- Poole, C. W.**—1423 10th Ave., Seattle, Wash. (Cleveland.)
- Pope Auto Co.**—Cedar and Halsey Sts., Newark, N. J. (Pope-Hartford.)
- Pope Automobile Co. of Washington.**—817-819 14th St., N. W., Washington, D. C. Pope-Toledo, Pope-Hartford, Pope-Waverley, Locomobile, Auto-car); garage; repairing.
- Pope Mfg. Co.**—436 Capitol Ave., Hartford, Conn. (Pope-Hartford, Pope-Toledo.)
- Pope Motor Car Co.**—Toledo, Ohio. (Pope-Toledo.)
- Pope-Toledo Motor Car Co.**—425 Delaware St., Kansas City, Mo. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Poppenberg Automobile Co.**—674-676 Main St., Buffalo, N. Y. (Rambler, Reo, Premier, Reliance.)
- Porrier, A.**—Garden City, Long Island, N. Y. (Maxwell); garage; repairing.
- Porter, F. R.**—East Stroudsburg, Pa. (Rambler.)
- Porter, Walter R.**—Keene, N. H. (Elmore.)
- Portland Co., The.**—Portland, Me. (Knox.)
- Portsmouth Garage, The.**—Fleet St., Portsmouth, N. H. (Stevens-Duryea.)
- Post, Amos.**—Catskill, N. Y. (Franklin.)
- Post, E. L.**—Col Spring, N. Y. (Waltham.)
- Post, E. L.**—East Houston St., San Tex. (Maxwell.)
- Post, E. L.**—Bet. Elm & Walnut rce City, Mo. (Ford); gar-irig.
- N. & Sons.**—Newfield, Mass.
- 1 Automobile Co.**—Omaha, Neb. ker, Cadillac, Franklin, White.)
- l's Garage.**—1404 Ridge Ave., Phil-phia, Pa. (Frayer-Miller.)

- Powers, A. H.**—San Francisco, Cal. (Waltham.)
- Power Vehicle Service Co.**—North & Madison Avenues., Baltimore, Md. (Welch.)
- Poyer, D. F.**—518 Main St., Menominee, Mich. (Buick, Cadillac.)
- Prasch, P. S.**—Buck St., Paulsboro, N. J. (Waltham.)
- Pratt, A. J.**—Coldwater, Mich. (Buick.)
- Pratt, Geo. B.**—Elkhart, Ind. (Loco-mobile.)
- Prentiss Motor Car & Supply Co.**—15 Berkeley St., Boston, Mass. (Stude-baker.)
- Prescott, Adamson.**—Broad & Spring-Garden Sts., Philadelphia, Pa. (Co-lumbia.)
- Preston Auto Co.**—Waitsburg, Wash. (Oldsmobile.)
- Price Bros.**—Huron St., Cleveland, O. (Baker.)
- Price, C. W.**—Greenfield, O. (Cadil-lac.)
- Price, P. M.**—Johnstown, Pa. (Stearns.)
- Pritchard, Percy.**—Utica, N. Y. (Max-well.)
- Prichard, R. S.**—39-41 Gallia Ave., Ports-mouth, O. (Buick, Pope-Waverley, Winton); garage; repairing.
- Priebe Carriage Co., C.**—205 S. 4th St., St. Joseph, Mo. (National.)
- Princeton Garage Co.**—Nassau St., Princeton, N. J. (Maxwell.)
- Prindle, B. A.**—Barre, Vt. (Elmore.)
- Pritchett, H. E.**—Jacksonville, Fla. (Franklin.)
- Procasky, Charles.**—411 Main St., Belle-ville Ill. (Dorris, Rambler.)
- Proctor, E. O.**—W. Main St., Ayer, Mass. (Jackson, Logan.)
- Proctor Supply Co., G. H.**—31 Stanhope St., Boston, Mass. (Stanley.)
- Prospect Park S. Garage.**—Coney Island & Church Aves., Brooklyn, N. Y. (Crawford.)
- Prout & Sons, A. H.**—Sandusky, O. (Frayer-Miller.)
- Provines, Harris G.**—Seneca, Mo. (Waltham.)
- Pueblo Automobile Co.**—Cor. Court & 4th Sts., Pueblo, Colo. (Pope-Waver-ley, Dragon, Ford.)
- Pueblo Elect. Co.**—117 W. 4th St., Pue-blo, Colo. (Frayer-Miller, Cameron.)
- Pueblo Novelty Works.**—310 N. Main St., Pueblo, Colo. (Rambler.)
- Puget Sound Auto Co.**—1405-07 Broad-way, Seattle, Wash. (National, Ram-bler, Commerce trucks); garage; re-pairing.
- Pugh Bros.**—15 Snow St., Providence, R. I. (Corbin, Elmore.)
- Pullman Auto Agency.**—7 Motor Mart, Boston, Mass. (Pennsylvania, Pull-man, Northern); repairing.
- Pullman Motor Car Co.**—Chicago, Ill. (Pullman Flyer.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Pullman Motor Car Co.**—1140 S. Main St., Los Angeles, Cal. (Pullman Flyer.)
Pullman Motor Car Co.—Portland, Ore. (Jackson.)
Pullman Motor & Vehicle Co.—Fisher Bldg., Chicago, Ill. (Model.)
Pullman Motor Car Co.—W. S. Duvall, Pres., Loan & Trust Bldg., Washington, D. C. (Pullman Flyer.)
Pullman, C. R.—Little Rock, Ark. (Logan.)
Purington, A. B.—126 Exchange St., Bangor, Me. (Columbia); garage; repairs, supplies.
Puritan Motor Co.—43 Columbus Ave., Boston, Mass. (Dolson, Mason.)
Putnam, C. M.—Moriah, N. Y. (Waltham.)
Putnam Garage Co.—Putnam, Conn. (Jackson.)
Putman Nelson Auto Co.—Berkeley, Cal. (Simplicity.)
Putzel, Morris.—Macon, Ga. (Ford.)
Pyramid Motor Car Co.—31 New St., Danbury, Conn. (White, Pope-Hartford, Pope-Toledo, Pope-Waverley, Cadillac.)

Q

- Quackenbush Co., W. H.**—Westfield, N. J. (Ford, Maxwell, Mitchell, Premier, Reo.)
Quaker City Auto Co.—Ohio & Atlantic Aves., Atlantic City, N. J. (Maxwell.)
Quaker City Auto Co.—144 N. Broad St., Philadelphia, Pa. (Pope-Toledo, Pope-Hartford, Peerless); garage; repairing.
Quebec Auto & Launch Co.—Cor. St. Augustin & St. Patrick, Quebec, Canada. (Russell, Reo, Ford, Pope-Toledo, Pope-Hartford, Pope-Waverley.)
Queen City Auto Co.—538 W. Micken Ave., Cincinnati, Ohio. (Knox, Waltham.)
Queen City Garage.—2203-2207 2nd Ave., Seattle, Wash. (Apperson.)
Queen City Auto Repair Works.—2201-2203 2nd Ave., Seattle, Wash. (Reliance.)
Quinby & Co., J. M.—27 Division St., Newark, N. J. (Renault, Panhard.)
Quincy Auto Co.—Quincy, Ill. (White.)
Quinn, T. H. & Co.—Straight, Pa. (White.)
Quick, Win T.—Big Rapids, Mich. (Northern.)

R

- Raban-Johnston.**—34 Broad St., Port Chester, N. Y. (Reo, Premier.)
Rabenold, W. F.—28 N. 11th St., Allentown, Pa. (American, Berliet, Dolson, Dragon); garage; repairing.

- Radkey, S. B.**—Cor. W. 5th & Colorado Sts., Austin, Tex. (Holsman.)
Rae, G. & J. M.—106 Falls St., Niagara Falls, N. Y. (Ford.)
Rainier Agency.—559 7th Ave., Pittsburgh, Pa. (Rainier.)
Rainier Co.—Broadway & 50th St., New York City. (Rainier.)
Rainier Motor Car Co.—1725 Michigan Ave., Chicago, Ill. (Rainier.)
Ramalay, F. W.—St. Paul, Minn. (Rauch, & Lang.)
Rambler Auto Co.—101 Fulton St., Syracuse, N. Y. (Rambler.)
Rambler Auto Agency.—707 Pacific Ave., Tacoma, Wash. (Rambler.)
Rambler Automobile Co.—1506 Capitol Ave., Omaha, Neb. (Rambler.)
Ramsay, B. S.—Plattsburg, N. Y. (Waltham.)
Ramsey-Hutchins Co.—1048 S. Main St., Los Angeles, Cal. (Pierce-Racine.)
Rand & Harvey.—Elizabeth St., Lewiston, Me. (Stanley.)
Randall, A. G.—109 N. 11th St., Boise, Ida. (Buick, Waltham); garage; repairing.
Randall Co., Fred E.—245 Columbus Ave., Boston, Mass. (Stevens-Duryea, Pullman.)
Randall Motor Car Co.—216 Beny St., Fort Wayne, Ind. (Stoddard-Dayton, Mitchell, Ford, Rambler, Model.)
Randliff Motor Car Co.—893 Boylston St., Boston, Mass. (Panhard.)
Randolph, T.—Nyack, N. Y. (Holsman.)
Ranlett Automobile Co.—76 Eastern Ave., St. Johnsbury, Va. (Stanley.)
Ranney & Co., A. Elliott.—1851 Broadway, New York City. (Elmore); garage; repairing.
Rarig Auto & Garage Co.—466 20th St., Oakland, Cal. (Queen, National, Jackson.)
Rarig Auto & Garage Co.—538 Golden Gate Ave., San Francisco, Cal. (National.)
Ray, D. A.—Fosston, Minn. (Buick.)
Ray-Wortham Automobile Co.—609 Throckmorton St., Fort Worth, Tex. (Stoddard-Dayton.)
Read Bicycle Co.—Ave. D, bet. 12th and 13th Sts., Miami, Fla. (Indian.)
Reading Automobile Co.—26 S. Fifth St., Reading, Pa. (Peerless, Franklin, Buick, Oldsmobile, Pope-Waverley); garage; repairing.
Reading Auto Co.—Philadelphia, (Peerless.)
Reading Auto Garage.—Reading, (Maxwell.)
Ream Bros. Auto Agency.—606-8 B way, Greenville, O. (Buick, Cadillac, Franklin, Knox, Packard, Walt White.)
Reason & Son, Geo. W.—Pine Mich. (Maxwell, Reo, Cartercar.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Reber, C. D.—Allentown, Pa. (Atlas.)
Reed-Underhill Co.—222 Columbus Ave., Boston, Mass. (Knox.)
Reed & Johnson.—109 W. Chicago St., Concord, Mich. (Reo.)
Reese, E. Shriver.—230 Euclid Ave., Cleveland, O. (Royal.)
Rees, H. O.—242 W. Commerce St., San Antonio, Tex. (Lambert.)
Reese, S., Machine & Tool Works.—Plymouth, Pa. (Lambert.)
Reeves, Burton.—Freeport, Ill. (Jewel.)
Reichert Auto Co.—Temple St., cor. George, New Haven, Conn. (Haynes, Waltham); garage; repairing; supplies.
Reich, Robt. A.—Broadway, Kansas City, Mo. (Merkel.)
Reidenbach, R. P.—Ashtabula, O. (Jackson.)
Reid, R. T.—Midland, Tex. (Mitchell.)
Reid, S. D.—Euclid Garage, Cleveland, O. (Dolson.)
Reilly, C. J.—Syracuse, Ind. (Waltham.)
Reinfried, C. J.—Manitowac, Wis. (Cameron.)
Reliable Auto Co.—7th St. and Pacific Ave., Tacoma, Wash. (Baker, Buick, Olds, Pope-Hartford, Pope-Toledo, Thomas.) Garage.
Reliance Machine Co.—40 S. Park Ave., Warren, O. (Maxwell, Reading Standard motorcycle.)
Reliance Electrical Works.—Astoria, Ore. (Waltham.)
Reliance Motor Car Co.—216 E. 3rd St., Cincinnati, O. (Maxwell.)
Remsen Mfg. Co., I. S.—754 Bedford Ave., Brooklyn, N. Y. (Locomobile.)
Renault Freres Selling Branch.—Broadway & 57th St., New York, N. Y. (Renault.)
Rendon-Y-Hermano, J.—Calle 63. No. 501, Merida, Yucatan, Mexico. (Franklin, Monarch, Cameron.)
Renfrew, S. S.—Harvey, N. D. (Buick.)
Renfro's Garage & Supply House.—Tonopah, Nev. (American.)
Reno Garage.—Cor. Lake & 2nd Sts., Reno, Nev. (Pope-Toledo, Franklin.)
Renst & Renst.—Junction City, Kan. (Ford.)
Reo & Williams Motor Car Co.—1032 4th St., Los Angeles, Cal. (Atlas, Reo.)
Reo, Frank O.—424 Stanyan St., Francisco, Cal., and Oakland, Pullman, Pennsylvania); garage; repairing.
Reo Co.—1634 Broadway, Denver, (Reo, Gale, Premier.)
Reo Co.—Walcott, N. Y. (Reo, Isotta.)

Reo Garage.—Riverside, Cal. (Reo.)
Reo Motor Agency.—100 York Square, New Haven, Conn. (Reo.)
Reo Motor Car Co.—1032 Euclid Ave., Cleveland, O. (Reo, Premier.)
Reo Motor Car Co.—289 Jefferson Ave., Detroit, Mich. (Reo.)
Reo Motor Car Co. of Philadelphia.—242 N. Broad St., Philadelphia, Pa. (Reo, Premier); repairing.
Reo Motors, Ltd.—Little George St., London, England. (Reo.)
Rhode, Claire.—Pine Village, Ind. (Haynes.)
Rettig, F. J.—Canal St., Wabash, Ind. (Lambert, Ford.)
Reyburn Motor Car Co.—4601 Olive St., St. Louis, Mo. (Stearns, Royal.)
Rhode Island Motor Car Co.—69 Broad St., Providence, R. I. (Pope-Hartford, Franklin.)
Rhoda, A.—Cooperstown, Griggs Co., N. Dak. (Mitchell.)
Rhodes, John F.—109 Church St., Elmira, N. Y. (Waltham, Jackson.)
Rhodes, Lewis F.—Phoenixville, Pa. (Simplicity.)
Rialto Automobile Co.—Fresno, Cal. (Winton.)
Rice, J. J.—Kramer, Ind. (Rambler.)
Rice, M. A.—Baltimore, Md. (Rauch & Lang.)
Richards, J. B.—2nd St., Ashland, O. (Ford, Jackson.)
Richardson Electric Co.—210 W. 1st St., Duluth, Minn. (Maxwell, Cadillac, Buick, Pope-Waverley, Reo, White.)
Richardson, J. R.—11th & West Sts., Wilmington, Del. (Rapid.)
Richardson, Lee.—Redlands, Cal. (Earl.)
Richardson Paper Co.—Lockland, O. (American Mercedes.)
Richards, W. E.—Weatherford, Texas. (Cadillac.)
Rich, H. M.—Morrisville, Vt. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Cadillac, Jackson.)
Richley, J. W.—29 S. Beaver St., York, Pa. (Cadillac, Franklin, Winton.)
Richmond-Jarvis Co.—13 Park St., Grand Rapids, Mich. (Jewel, Rambler, National.)
Richter, Robert H.—1421 Michigan Ave., Chicago, Ill. (Hotchkiss.)
Rickey Machine Co.—92 Eaton Place, East Orange, N. J. (Marmon.)
Riddell Automobile Co.—720 Locust St., Des Moines, Ia. (Buick, Cadillac, Franklin, Winton.)
Rietveld, H.—Pella, Iowa. (Waltham.)
Riggs, J. Dudley.—1118 Cathedral St., Baltimore, Md. (Simplex.)
Riggs Land Co.—Redfield, S. Dak. (Lambert.)
Riggs, T. D.—Hartford, Conn. (Isotta.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Rinehard, A. B.—Akron, O. (White.)
Ring, M. B.—19 Chestnut St., Norwich, Conn. (Maxwell.)
Ripner, L. W.—Stroudsburg, Pa. (Reo.)
Risden, C. W.—223 W. 8th St., Los Angeles, Cal. (Indian.)
Rissman, Carl.—Hanover, Germany. (Monarch.)
Rittenhouse Garage.—220 S. 23rd St., Philadelphia, Pa. (American Mercedes); garage; repairing.
Ritter, J. F. Wm.—Youngstown, O. (Peerless, Packard); repairing.
Riverside Garage.—10th St., nr. Market, Riverside, Cal. (Maxwell.)
Rivers Jacoby Auto Co.—2651 Monroe St., Toledo, O. (Rambler.)
Roanoke Auto Co.—107 Church St., Roanoke, Va. (Rambler.)
Robbing, G. D.—San Antonio, Tex. (Mitchell.)
Roberage, J. A.—Meriden, Conn. (Knox, Haynes, Cadillac, Winton.)
Roberts & Co., O. G.—152 N. Main St., Columbus, O. (Stoddard-Dayton, Glide, Jackson.)
Roberts, David.—Talcott Ave., Rockville, Conn. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
Robertson & Bennett.—Keene, N. H. (Stanley, Rambler.)
Robertson, J. W.—Taunton, Mass. (Elmore, Cadillac.)
Robinson & Adams Co.—522 Spruce St., Scranton, Pa. (Maxwell.)
Robinson Auto Station.—Pleasant St., Worcester, Mass. (Cadillac); garage.
Robinson, B. J.—Vicksburg, Miss. (Cadillac.)
Robinson, D. N.—Hattiesburg, Miss. (Waltham.)
Robinson, J. E.—Oil City, Pa. (Elmore.)
Robinson, T. F.—352 Market St., St. Paul, Minn. (Reliance.)
Robbing, Edward.—Scranton, Pa. (Indian.)
Rochester Automobile Co.—150 South Ave., Rochester, N. Y. (Columbia, Baker, Lansden, Matheson, Packard.)
Rockford Engineering Co.—Rockford, Ill. (Babcock.)
Rodgers & Co.—710 Gay St., Knoxville, Tenn. (Reo, Rambler, Oldsmobile, Rapid.)
Rodgers, C. M.—Buffalo, N. Y. (Rapid.)
Rodgers, Ernest.—Hico, Tex. (Waltham.)
Roemer, Emil.—29-31 School St., Webster, Mass. (Maxwell.)
Rogers & Co., Ralph.—316 W. Main St., Burlington, Iowa. (Rambler, Reo.)
Rogers, Clarence M.—1114 Main St., Buffalo, N. Y. (Rapid.)
Rogers, F. O.—Concord, N. C. (Maxwell.)

Rohr, Frank E.—Winchester, Ind. (Logan.)
Roiden & Riggs.—Watertown, N. Y. (Cadillac.)
Roler, J. S.—171-181 3rd Ave., N. Nashville, Tenn. (Rambler.)
Rolls-Royce Import Co.—1879 Broadway, New York City. (Rolls-Royce.)
Romaine, D. W.—Mercer & Brunswick Sts., Jersey City, N. J. (Marion.)
Ronell, A. L.—Fort Dodge, Iowa. (Deere.)
Roosevelt Auto Co. Inc.—Carteret, N. J. (Knox.)
Roscoe, Benjamin.—Winsted, Conn. (Maxwell.)
Rose Automobile Co.—1st & Walnut Sts., Spokane, Wash. (National, Mitchell, American Mors.)
Rose, E. B.—537 Mercer St., Jersey City, N. J. (Maxwell.)
Rosena Bros.—Bucyrus, O. (Reo.)
Rosenblatt, J. M.—Greensboro, N. C. (Jackson.)
Rosensteel, John E.—High St., Ebensburg, Pa. (Mitchell.)
Rosenthal, Arthur M.—North and Detroit Sts., Kenton, O. (Reo, Premier, Winton.)
Roseville Motor Car Co.—620 Orange St., Newark, N. J. (Dragon, Pope-Waverley.)
Ross, A. H.—Flatiron, Bldg., Main St., Akron, O. (Reo.)
Ross, C. W.—Elmira, N. Y. (Haynes.)
Rossler Mfg. Co., C.—507 Ellicott St., Buffalo, N. Y. (Rossler.)
Roswell Auto Co.—Roswell, New Mexico. (Buick, Pope-Toledo.)
Roswell Hardware Co.—Roswell, New Mexico. (Maxwell.)
Roth, Jacob.—1117 State St., Erie, Pa. (Cadillac, Peerless.)
Rothschild, Albert.—Wilmington, N. C. (Maxwell.)
Rowan & Co., Henry G., Jr.—2028 Sansom St., Philadelphia, Pa. (De Dietrich.)
Royal, P. P.—Drummond, Mont. (Waltham.)
Rubright, A.—2nd and Market Sts., Canton, O. (Reo, Premier.)
Rudy, W. E.—125 E. Market St., Lima, O. (Ford, Premier.)
Ruede, F. S.—Akron, O. (Dolson.)
Ruhl & Johnston.—Decatur, Ill. (Pope-Waverley.)
Runkle, Jerry.—Gainsville, W. Va. (Winton.)
Rummele, E. H.—807 N. Main St., Wigan, Wis. (Winton.)
Rush, Gardner & Bartlett.—Tex. (Pope-Hartford.)
Rush, J. R.—Bel Air, Md.
Russell, L. B., Jr.—Coma, W. Va. (Waltham.)
Russell, T. M.—Middleton, Wis. (Locomobile.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Rust, Geo. E.**—2201 Second Ave., Seattle, Wash. (Reliance.)
Rutan Co., P. C.—46 Front St., Port Jervis, N. Y. (Pope-Hartford.)
Rutland Machine & Auto Co.—55-61 Wales St., Rutland, Vt. (Buick, Winton, Franklin); garage; repairing.
Rutland Motor Co.—76 West St., Rutland, Vt. (Maxwell, Waltham.)
Rutter, C. L.—Henry & New Hampshire Sts., Lawrence, Kan. (Pope-Waverley, Maxwell.)
Ryan, Garret T.—Phoenix, Ariz. (National.)
Ryan, Harris J.—Stanford University, Cal. (Waltham.)
Rykert & Gould.—122 California St., Sycamore, Ill. (Cartercar.)

S

- Sabine Supply Co.**—Orange, Tex. (Cadillac.)
Safety Door Hanger Co.—Ashland, O. (Mitchell.)
Saque & Son, Horace.—184 Church St., Poughkeepsie, N. Y. (Cadillac); garage; repairing; supplies.
Sallander, A. W.—627 Front St., Fort Madison, Iowa. (Buick, Cadillac.)
Sanborn, E. S.—Ormond, Fla. (Waltham.)
Sanborn, Frank W.—176 N. Main St.; Concord, N. H. (Rambler.)
Sanchez-Juarez & Co.—Mexico City, Mexico. (Peerless.)
Sander & Co., J. M.—Akron, O. (Cartercar.)
Sands Electric & Mfg. Co., H. S.—1143 Market St., Wheeling, W. Va. (Rambler.)
Sandt, Geo. M.—333 Broad St., Red Bank, N. J. (Maxwell.)
Sanford Auto Co.—Sanford, Me. (Cadillac.)
Sanford, M. C.—Clyde, Ohio. (Northern.)
San Francisco Motor Co.—Berkeley, Cal. (Dolson.)
Sangamo Auto Garage.—Springfield, Ill. (Queen.)
Sanger, E. F.—Milwaukee, Wis. (Maxwell.)
Sanger, Geo. T.—206 W. Main St., Orange, Mass. (Waltham, Reo, Yale motor-cycles); garage; repairing.
San Luis Auto & Machine Co.—San Luis, Obispo, Cal. (Maxwell.)
Santa Monica Garage.—Santa Monica, Cal. (Maxwell.)
Santa Rosa Garage.—5th St., Santa Rosa, Cal. (Winton.)
Sargent, W. M.—Morrisville, Vt. (Jackson.)

- Sarver, Herman.**—Muncie, Ind. (Waltham.)
Sauerbach, C. N.—12 Rue Portals, Paris, France. (Mitchell.)
Sawyer Carriage Co.—Lowell, Mass. (Autocar, Corbin.)
Sawyer, Floyd.—Brighton, Mich. (Waltham.)
Sayre Machine Auto Co.—104 Cross St., Sayre, Pa. (Cadillac.)
Schaefer & Co.—11 East 2nd St., Dayton, O. (Indian.)
Schaffer Mfg. Co.—308 N. Calvert St., Baltimore, Md. (Jackson, Pullman.)
Schellentrager, E. J.—Cleveland, O. (Matheson.)
Schellentrager, E. J.—41 Leader Bldg., Pittsburg, Pa. (Matheson.)
Schemmel, Geo. C.—Wapakoneta, Ohio. (Maxwell.)
Schenectady Automobile Co.—Schenectady, N. Y. (Maxwell.)
Schenley Automobile Co.—3994 Forbes St., Pittsburg, Pa. (Knox.)
Schrack Bros.—Great Neck, N. Y. (St. Louis.)
Schilling, M.—Santa Rosa, Cal. (Maxwell.)
Schlegel, C. G.—Kenesaw, Neb. (Waltham.)
Schlosser, R. J.—25 E. Pennsylvania Ave., Warren, Pa. (Cadillac, Winton.)
Schmidt, A. G.—1404 Michigan Ave., Chicago, Ill. (Clement-Bayard.)
Schmidt Automobile Co.—Iowa City, Ia. (Mitchell.)
Schmidt, Edw.—Mineola, N. Y. (National, Rambler.)
Schmitt Bros.—Dowagiac, Mich. (Jackson.)
Schneider, P. J.—187 Jefferson Ave., Detroit, Mich. (Columbia, Pierce, Pope-Toledo, Franklin, Stevens-Duryea.)
Schoeffel Auto & Livery Co.—26 Plymouth Ave., Rochester, N. Y. (Royal.)
Schram, J. C.—Marietta, Ohio. (Jackson.)
Schroeder, H.—229-231 W. Market St., York, Pa. (Reo, Premier, York-Pullman); garage; repairing.
Schroeder, H.—Main St., Shrewsbury, Pa. (Reo, Premier, York-Pullman); garage; repairing.
Schuell & Schapl.—Woodstock, Ill. (International.)
Schug Bros.—Berne, Ind. (Mitchell.)
Schuh & Co.—Kentland, Ind. (Waltham.)
Schulte, B. W.—2 Lyceum Ave., Scranton, Pa. (Rambler.)
Schultz, Chas. C.—New Orleans, La. (Waltham.)
Schultz, J. H.—Blacksburg, Va. (Ford, Rambler, Logan.)
Schuman Carriage Co.—Honolulu, Hawaiian Islands. (Ford.)
Schwartz, Harry D.—Crown Point, Ind. (Waltham.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Schwartz, J. I.—Bridgeton, N. J. (Rapid.)
Schwender Bros.—Mankato, Minn. (Pierce Racine.)
Schwerin, J. A.—Sumter, S. C. (North-ern.)
Scotdale Automobile Co.—Scotdale, Pa. (Stearns, Franklin.)
Scott, A. D.—3916 Washington Ave., St. Louis, Mo. (Mitchell.)
Scott, A. J.—Rugby, N. Dak. (North-ern.)
Scott Motor Co., Geo. J.—1720 Broad-way, New York City. (Glide; garage; repairing.)
Scott, D. C.—Anaconda, Mont. (Pope-Hartford.)
Scott Mfg. Co.—Adele, Ia. (Holsman.)
Scranton Garage & Motor Co.—Mer-chants & Mechanics Bank, 419 Spruce St., Scranton, Pa. (Buick, Cadillac, Franklin, Pope-Toledo, Pope-Hart-ford, Matheson.)
Scrivens, C. L., New Garage.—13 Spring St., Ashtabula, O. (Buick, Cadillac); garage; repairing.
Scul, John I.—258 N. Broad St., Phila-delphia, Pa. (Acme.)
Seaman & Merkel.—Fleetwood, Pa. (Rambler, Reo.)
Seaman, Samuel J., Jr.—Glen St., Glen's Falls, N. Y. (Ford.)
Sears-Nattinger Auto Co.—812 Walnut St., Des Moines, Iowa. (Ford, Reo, Stoddard-Dayton.)
Seattle Automobile Co.—1423 10th Ave., Seattle, Wash. (Columbia, Lo-comobile, Franklin.)
Seavey Bros.—50 Emerson St., Haver-hill, Mass. (Lambert.)
Seidler-Miner Auto Co.—244 Jefferson Ave., Detroit, Mich. (Babcock, Jack-son.)
Seifert & Co., E. W.—Shelbyville, Ind. (Maxwell, National.)
Seiler Co., The.—Jamestown, N. Dak. (Cadillac.)
Seligman, A. F.—Troy, Ill. (Jewel.)
Selleck, John L.—South St. & Union Ave., Peekskill, N. Y. (Rambler, Marion.)
Selma Gun & Key Co.—917 Water St., Selma, Ala. (Wayne, Pope-Hartford, Waltham, Mitchell); garage; repairing.
Sessions, J. B.—Bristol, Conn. (Loco-mobile.)
Severn, J. H.—Lakota, N. Dak. (Reo, Premier.)
Sexton, C. A.—Perth Amboy, N. J. (Maxwell.)
Shackelford & Leffordge Co.—West-boro, Mo. (Jackson.)
Shafer Mfg. Co.—408 N. Calvert St., Baltimore, Md. (Rapid, Jackson, York Pullman.)

Shaler Co., C. A.—Waupun, Wis. (El-more.)
Shambaugh, Charles.—S. Raub, Ind. (Buick, Pope-Toledo, White.)
Shamlaugh, Chas., Auto Inn.—Lafay-ette, Ind. (Cadillac, Pope-Toledo, White.)
Shanklin, N. J.—Marion, Kan. (Wal-tham.)
Shannahan & Wrighain Hardware Co.—N. Washington St., Easton, Md. (Rambler.)
Sharman Automobile Co.—109-111 W. South Temple St., Salt Lake City, Utah. (American Mors, Reo, Moline, Mitchell, National, Woods.)
Sharps Garage.—Bakersfield, Cal. (Maxwell.)
Sharp, W. H. B.—Indian Head, Sask., Canada. (Holsman.)
Shaw Co., Walden W.—1532-1534 Michi-gan Ave., Chicago, Ill. (Berliet); garage; repairing.
Shaw, L. B.—Riddlesburg, Pa. (Cadil-lac.)
Shean Auto Co.—640 Main St., Spring-field, Mass. (Oldsmobile, American Mercedes.)
Shearer Auto Co., S. C.—1650 Glenarm St., opp. Denver Club, Denver, Colo. (Haynes.)
Sheets & Knoble.—De Kalb, Ill. (Pope-Waverley.)
Shenango Valley Auto Co.—Sharon, Pa. (Mitchell.)
Shepard Co.—Providence, R. I. (Co-lumbia.)
Shepard, Walter L.—364 Franklin St., Melrose Highlands, Mass. (Winton, Stanley.)
Sherill & Morgan, Drs.—Camp Crook, S. Dak. (Cadillac, Waltham.)
Sherrer, Dr. F. A.—Easton, Pa. (Mit-chell.)
Shetter, A. B.—Middletown, O. (Ca-dillac.)
Sherwood, H.—San Francisco, Cal. (Monarch.)
Shelter, L. T.—633 S. Grand St., Los Angeles, Cal. (Reo.)
Shellingham, H. L.—20 N. 4th St., Grand Forks, N. Dak. (Mitchell.)
Shinholser & Co., J. W.—217 3rd St., Macon, Ga. (Franklin, Cadillac.)
Shipman, Ralph.—Sunbury, Pa. (Max-well.)
Shrive, William.—64 W Yonkers, N. Y. (Cadillac.)
Shookman & Son.—Goshen, I tham.)
Shore & Beach.—Lincoln, Neb.
Shreve, E. G.—Atlantic City, N. J. tham.)
Shreveport Auto & Gas Engine 319 Spring St., Shreveport, La (Pope-Toledo.)
Shirey, M. A.—110 W. Wayne St., Sou Bend, Ind. (Monarch, Ford.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Shuey, N. A.**—South Bend, Ind. (Atlas.)
- Shugers, George.**—Auburn, Ind. (Maxwell.)
- Shugert, G. S.**—247 Adams St., Rochester, Pa. (Northern, Rambler, Haynes); garage; repairing.
- Shuler, W. P.**—1002 Morton St., Baltimore, Md. (Pungs-Finch, Maxwell.)
- Shutt, W. H.**—1711 Broadway, New York City. (Buick, Corbin, Pope-Waverley.)
- Sidles Automobile Co., H. E.**—13th & P Sts., Lincoln, Neb. (Cadillac, Woods.)
- Siegfried J. B.**—Cambridge, Ohio. (Jewell.)
- Simplex Auto Co.**—336 N. Broad St., Philadelphia, Pa. (Isotta Fraschini, Panhard, Renault.)
- Simplex Distributing Co., The.**—12 W. 33rd St., New York City. (Simplex.)
- Simplicity Auto Co.**—15th St. and Cleveland Pl., Denver, Colo. (Simplicity.)
- Sims & Co., H. W.**—Inkster, N. Dak. (Buick.)
- Sims, W. P.**—Bisbee, Ariz. (Waltham.)
- Simmons, Burt R.**—310 Connolly St., Paris, Ill. (Waltham, Buick, Pope-Toledo); garage; repairing.
- Simmonds & Francis.**—Flandreau, S. Dak. (Moline, Atlas.)
- Simons, G. O.**—Shelby, Ohio. (Winton.)
- Simonson, Wm.**—Mineola, N. Y. (Mitchell.)
- Singer Automobile Co.**—573 Farwell Ave., Milwaukee, Wis. (Franklin, Maxwell.)
- Singer Auto Co.**—3939 Oliver St., St. Louis, Mo. (Premier.)
- Sioux Falls Auto Supply Co.**—112-114 N. Main Ave., Sioux Falls, S. Dak. (Jackson, Rambler, Ford); garage; repairing.
- Sitton, Albert.**—Fullerton, Cal. (Royal.)
- Siver Carriage Co.**—52 Cedar St., Oneida, N. Y. (Maxwell, Ford.)
- Skelven & Co., N. J.**—325 Water St., Augusta, Me. (Franklin, Elmore.)
- Skene, J. W.**—88-90 Bates St., Lewiston, Me. (Rambler, Ford); garage; repairing.
- Skinner, L. H.**—Colorado Springs, Colo. (Hudson.)
- Slavin, Wm.**—Suffern, N. Y. (Maxwell.)
- Slosson, E. P.**—1788 Fell St., San Francisco, Cal. (Premier, Crawford.)
- Slutter & Gamble.**—Burlington, Iowa. (Maxwell.)
- Shutt, W. H.**—845 Broad St., Newark, N. J. (Buick, Corbin, Pope-Waverley.)
- Shutt, W. H.**—373 Bloomfield Ave., Montclair, N. J. (Buick, Corbin, Pope-Waverley.)
- Smart & Son, Eugene.**—459 Central Ave., Dover, N. H. (Stanley.)
- Smealie Bros.**—10 Division St., Amsterdam, N. Y. (Franklin.)
- Smelser, Lealie.**—New Windsor, Md. (Cadillac.)
- Smelzer, W. M.**—Rockville, Nev. (Waltham.)
- Smith's Agency & Auto Garage.**—Earlville, Ill. (Cadillac.)
- Smith, A. E.**—Sandy Hill, N. Y. (Maxwell.)
- Smith, A. I.**—213-219 Wisconsin St., Wauwatosa, Wis. (Cameron.)
- Smith, A. J.**—Gen. Sales Agent, 1228 Figueroa St., Los Angeles, Cal. (Elmore.)
- Smith, A. L.**—Elmira, N. Y. (Studebaker.)
- Smith, Alexander.**—35 Mulberry St., Hartford, Conn. (Indian.)
- Smith & Co., N. C.**—Mt. Vernon, N. Y. (Rapid.)
- Smith Bros.**—Los Angeles, Cal. (Rainier.)
- Smith & Sander.**—Akron, Ohio. (Premier, Rambler.)
- Smith & Jordan.**—231 Flatbush Ave. and 10 Clinton St.; charging station, 811 Union St., Brooklyn, N. Y. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)
- Smith Auto Co.**—61st St. & Broadway, New York City. (Smith.)
- Smith Auto Co.**—1420 Court Place, Denver, Colo. (Smith, Mora, American, Marvel, Logan.)
- Smith Automobile Co.**—Kansas City, Mo. (Smith.)
- Smith, A. R.**—809 E. Kearsley St., Flint, Mich. (Buick.)
- Smith, B. K.**—Monticello, Ind. (Waltham.)
- Smith, Carey, W. & Co.**—98 W. Lincoln Ave., Mt. Vernon, N. Y. (Rapid.)
- Smith Carriage Co., John M.**—Atlanta, Ga. (Reo.)
- Smith, Clawson.**—420-422 Michigan Ave., Lansing, Mich.
- Smith, Clyde H.**—Skowhegan, Me. (Cadillac.)
- Smith Co., C. H.**—Warren, Pa. (Haynes.)
- Smith Co., Ltd., C. H.**—Sheffield, Pa. (Haynes.)
- er & Co.**—2nd St., bet. Main and h Sts., Santa Anna, Cal. (Reo.)
- er, O. M.**—Anaheim, Cal. (Reo.)
- er, Morris B.**—West Chester, Pa. (Ford.)
- er, W. F.**—Bloomsburg, Pa. (Holsen.)
- er & Co., E. J.**—78 Holman St., Attleboro, Mass. (Dragon, Jackson.)
- ughter, R. L.**—Midland, Tex. (Buick.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Smith Co., Ltd., C. H.—Ridgway, Pa. (Haynes.)
Smith, C. R.—1230 Fulton St., 200 Bedford Ave., Brooklyn, N. Y. (Frayer-Miller.)
Smith, De Ephraim.—103 W. Peachtree Ave., Atlanta, Ga. (Mitchell.)
Smith, E. L.—2339 S. Grand Ave., St. Louis, Mo. (Matheson.)
Smith, Fred M.—218 2nd Ave., Hibbing, Minn. (Rambler.)
Smith, Fred S.—38 Columbus Ave., Boston, Mass. (Walter, Autocar.)
Smith, G. Bennet.—Freeport, N. Y. (Logan.)
Smith, G. C.—Blackhawk, Ind. (Wal-
 tham); light repairs.
Smith, Geo. W.—Newport, R. I. (Max-
 well.)
Smith, G. W.—Littleton, N. H. (Buick,
 Cadillac.)
Smith, Harry.—Pinegrove, Pa. (Ram-
 bler.)
Smith, John E.—Easton, Pa. (Max-
 well.)
Smith, J. A.—Saratoga Springs, N. Y. (Thomas Flyer.)
Smith, L.—West Point, Ia. (Carter-
 car.)
Smith Machine Co.—Van Rensselaer
 St., Cohoes, N. Y. (Maxwell.)
Smith, M. F.—Pittsburg, Pa. (Walter.)
Smith, N. J. & F. C.—Ridgewood, N. J. (Maxwell.)
Smith Sons, H.—Manteno, Ill. (Cadil-
 lac.)
Smith, S. A. & C. A.—Brattleboro, Vt. (Premier.)
Smith, W. E.—Dalhart, Tex. (Wal-
 tham.)
Smith, Wm.—2395 Boulevard, Jersey
 City, N. J. (Logan, Reo, Premier,
 Rapid, Ford.)
Smythe, Robert.—Rock Island, Ill. (Maxwell.)
Snoddeal Auto Co., Geo. R.—2552 Mad-
 ison Ave., Baltimore, Md. (Marmon.)
Snow Automobile Co.—86 Dorrance St.,
 Providence, R. I. (Stevens-Duryea.)
Snowden, John W.—Peekskill, N. Y. (Winton.)
Snow Hardware Co.—36 Union St.,
 Rockville, Conn. (Buick, Cadillac.)
Snyder & Kerr.—Attica, Ind. (Jackson,
 Reo, Overland, Wayne.)
Snyder Auto Cycle Co.—York, Pa. (Pull-
 man.)
Snyder Automobile Co.—229 W. Market
 St., York, Pa. (Baker, Pope-Toledo,
 White.)
Snyder, O.—57 Broad St., Bethlehem,
 Pa. (Chadwick, Logan, Pierce Ra-
 cine.)
Snyder, Robert J.—Bethlehem, Pa. (Holsman.)

Société Anonyme Westinghouse.—52
 West 67th St., New York City. (West-
 inghouse.)
Sohner, J. W.—Ironton, Ohio. (Ford.)
Solliday & Co.—4th & Prairie Sts., Mil-
 waukee, Wis. (Wayne.)
Somerville Auto Co.—Boston Ave. and
 Broadway, W. Somerville, Mass. (Rambler, Maxwell.)
Sontag, F. A.—Houston, Tex. (Thomas
 Flyer.)
Soules, Welch Motor Car Co.—736
 Woodward Ave., Detroit, Mich. (Welch, Soules, Baker.)
South Automobile Co.—105 S. Concep-
 tion St., Mobile, Ala. (Pierce Arrow.)
South Broad Auto Co.—729 S. Broad St.,
 Philadelphia, Pa. (Dorris, Stevens-
 Duryea); garage; repairing; supplies;
 electric charging.
South End Automobile Co.—7 Wright
 St., Newark, N. J. (Walter.)
Southern Auto Co., Ltd.—930 Common
 St., New Orleans, La. (Rambler,
 Ford, Premier.)
Southern Auto Co.—College St., Ash-
 ville, N. Y. (Ford, Rambler.)
Southern Auto Co.—1200 Mt. Royal
 Ave., Baltimore, Md. (Pierce Arrow);
 repairing.
Southern Automobile Co.—Mobile, Ala. (Wayne.)
Southern Automobile Co.—168 N. Col-
 lege St., Nashville, Tenn. (Buick,
 Cadillac, Oldsmobile, Stanley, Pope-
 Toledo, Pope-Hartford, White.)
Southern California Motor Co.—1811 S.
 Main St., Los Angeles, Cal. (Ameri-
 can, Marion.)
Southern Garage Co.—35-37 W. Mound
 St., Columbus, Ohio. (Buick); gar-
 age; repairing.
South Haven Auto Co.—South Haven,
 Mich. (Babcock, Elmore, Franklin,
 Thomas.)
South Side Auto Co.—2339 S. Grand
 Ave., St. Louis, Mo. (Corbin, Mathe-
 son.)
Southwestern Automobile Co.—West
 Adams St., Phoenix, Ariz. (Ram-
 bler.)
Southworth Co., A. G.—1733 Broadway,
 New York City, 342 Flatbush Ave.,
 Brooklyn, N. Y. (Pope-Toledo, Pope-
 Hartford, Pope-Waverl.)
Spalding Bros.—Abilene,
Spalding & Bros., A.
 St., Philadelphia, I
 yea.)
Spalding & Bros., A. C.
 garage. 144 W. 50th
 Duryea); garage; repair
Spalding Cotton Mills.
 (Maxwell.)
Spalin, J. C.—Lyons, Iowa.

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Spankle, W. Judson.**—242 N. Broad St., Philadelphia, Pa. (Hotchkiss Reo, Premier); repairing.
- Spear, C. A.**—Oakfield, N. Y. (Waltham.)
- Special Motor Vehicle Co.**—225 E. 4th St., Cincinnati, Ohio. (Ford.)
- Speers, M. H.**—Pine Bluff, Ark. (Thomas Flyer.)
- Spencer & Parker.**—121 E. Milwaukee St., Janesville, Wis. (Jackson.)
- Spencer, C. H.**—Phenix, R. I. (Waltham.)
- Spencer Motor Co.**—316 N. Broad St., Philadelphia, Pa. (Jackson.)
- Sperry, W. M.**—Leroy, N. Y. (Maxwell.)
- Splatt, Wall & Co.**—Perth, Australia. (Monarch.)
- Spinney, H. I.**—Farmington, Me. (Stanley.)
- Spinning, F. M.**—1310 2nd Ave., Seattle, Wash. (Indian.)
- Springer & Eastroid.**—Mayville, N. Dak. (Ford.)
- Springfield Auto Co.**—40 Liberty St., Springfield, Mass. (Stevens-Duryea, Locomobile, Franklin); garage.
- Spurling, H. G. W.**—Hamilton, Bermuda. (Rapid.)
- Squires, E. G.**—Ottawa and Pearl Sts., Grand Rapids, Mich. (Gearless, Michigan.)
- Staacke Bros.**—133 W. Commerce St., San Antonio, Tex. (Stevens-Duryea.)
- Stagg, Stephen.**—Richmond, Va. (Holsman, Maxwell.)
- St. Albans Foundry Co.**—St. Albans, N. Y. (Rambler.)
- St. Paul Motor Co.**—184 Western Ave., St. Paul, Minn. (Oldsmobile.)
- Stamp, Jacon C.**—1327 Market St., Wheeling, W. Va. (Winton.)
- Standard Auto Co.**—750 Woodward Ave., Detroit, Mich. (Packard, Oldsmobile); repairing; supplies.
- Standard Auto Co.**—1206 Huron Road, Cleveland, O. (Packard.)
- Standard Auto Garage Co.**—234 N. Phelps St., Youngstown, O. (Buick, Franklin, Pope-V.)
- Standard Automol** —5917 Baum St., E. E. Pitt a. (Packard, —110 5th Ave., (Moline); garage; re-
- Standard Motor Co.**—4 Waybosset Avenue, R. I. (Pennsylvania.)
- Motor Car Co.**—118 East 9th Angeles, Cal. (Ford, Soules.)
- Motor Car Co.**—503 Golden e Ave., San Francisco, Cal. (Ford, les, Babcock.)
- Standard Motor Car Co.**—419 Linden St., Scranton, Pa. (Autocar, Pierce Arrow.)
- Stanford Garage.**—112 Alma St., Palo Alto, Cal. (Ford.)
- Stanley, C. F.**—Montreal, Canada. (Stanley.)
- Stanley, I. N.**—Kingfield, Me. (Stanley.)
- Stark Summit Auto Co.**—512 S. Arch Ave., Alliance, Ohio. (Mitchell, Cartecar, Ford, Marvel); garage; repairing.
- Starr & Son, J. G.**—Decatur, Ill. (Northern.)
- Star Motor Car Co.**—226 Halsey St., Newark, N. J. (Pullman.)
- State Automobile Co.**—Mignonette & Randolph Sts., Pittsburg, Pa. (Logan, York Pullman.)
- State Motor Service Co.**—216 W. 50th St., New York City. Second-hand cars.
- State Novelty Works.**—324 Fuller St., Helena, Mont. (Rambler.)
- Stearns Auto Agency.**—1429 Broadway, Seattle, Wash. (Stearns.)
- Stearns Co., F. B., The.**—Cleveland, O. (Stearns.)
- Stearns Hardware Co.**—Port Arthur, Tex. (Waltham.)
- Stebbs Auto Co., H. D.**—Chattanooga, Tenn. (Reo, Rambler.)
- Steels, C. F.**—Alpena, Mich. (Cadillac.)
- Steger, H. B.**—1014 9th St., Douglas, Ariz. (Ford, Waltham.)
- Steinhart-Jensen Auto Co.**—Joliet, Ill. (Holsman.)
- Stenger & Rohm.**—Main St., Saville, N. Y. (Ford.)
- Stephens, John E.**—102 Congress St., Rumford Falls, Me. (Reo, Maxwell.)
- Stephenson, W. W.**—Box 24, Bakersfield, Colo. (Maxwell, Rambler.)
- Stepney Auto Supply Station.**—Stepney, Conn. (Waltham.)
- Sterling Garage & Auto Co.**—Prince St., Elizabeth, N. J. (Winton.)
- Sterling Mfg. Co.**—Fall River, Mass. (Locomobile.)
- Sterling Motor Car Co.**—180-184 Water St., Binghamton, N. Y. (Ford, Marmon, Jackson); garage; repairing.
- Steuerwald Machine Co.**—St. Ansgar, Ia. (Mitchell.)
- Stevens, B. A.**—Charles City, Iowa. (Locomobile, Cadillac.)
- Stevens Co., E. A.**—Fitchburg Hotel, Main St., Fitchburg, Mass. (Glide); garage; repairing.
- Stevens, Dr. F. E.**—Bridgeton, Me. (Cadillac.)
- Stiverson, Frank E.**—Cleveland, O. (Atlas.)
- Steward, A. C.**—St. Louis, Mo. (Dorris.)
- Steward, H. C.**—Riverside, Cal. (Rambler.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Stewart, B.—Deadwood, S. Dak. (Holman.)
Steward Co., A. C.—10th and Santee Sts., Los Angeles, California. (Dorris.)
Stienhauer, F. C.—56 Edgewood Ave., Atlanta, Ga. (Rambler.)
Stilson, Adelbert.—1018 Sprague Ave., Spokane, Wash. (Peerless.)
Stine & Parks.—Arch St., Freemont, Ohio. (Reo.)
Stinemetz, Fred.—Port Chester, N. Y. (Maxwell.)
Stites, C. W.—Independence, Iowa. (Haynes.)
St. Joseph Automobile & Supply Co.—7th & Francis Sts., St. Joseph, Mo. (Oldsmobile.)
St. Louis Automobile Co.—453 N. Boyle Ave., St. Louis, Mo. (Jackson.)
St. Louis Car Co.—1706 Broadway, New York City. (American Mors.)
Stocker, August.—Salt Lake City, Utah. (Peerless, Autocar.)
Stoddard-Dayton Motor Car Co.—10th & Main Sts., Los Angeles, Cal. (Stoddard-Dayton.)
Stoddard & Co., A. P.—Gloucester, Mass. (Mitchell.)
Stokois & Zonen.—Rotterdam, Holland. (Monarch.)
Stoltz, C. C.—126 & 128 N. Prospect St., Marion, Ohio. (Autocar, Buick); garage; repairing, supplies.
Stondall & Melaa.—309 E. Wilson St., Madison, Wis. (Rambler.)
Stone Automobile Co., Inc.—1006 Main St., Stroudsburg, Pa. (Cadillac, Stevens-Duryea); garage; repairing.
Stone, Geo. H. P.—Harter Block, Ilion, N. Y. (Pope-Hartford.)
Stone, H. J.—Los Angeles, Cal. (Frayer-Miller.)
Storm, W. A.—Galena, Kan. (Model.)
Stoughtin, Folkins Co.—224 Commercial St., Portland, Me. (Maxwell.)
Stover, H. L.—144 S. Main St., Chambersburg, Pa. (Reo, Rambler.)
Stowers, J. L.—Havana, Cuba. (Waltham.)
Strait & Son., J. G.—Wainscott, N. Y. (Reo.)
Stranahan & Eldridge Co.—541 Tremont St., Boston, Mass. (Buick.)
Stratton Co., H. C., Inc.—173 Huntington Ave., Boston, Mass. (De Luxe, Kisselkar, American Mercedes.)
Strauss & Son, Herman.—Louisville, Ky. (Waltham.)
Strauss Bros. & Co.—Ligonier, Ind. (Matheson.)
Straus, John Mason.—3d and Chestnut Sts., Louisville, Ky. (Pierce-Arrow.)
Stringer, Bert A.—Calgary, Alberta, Canada. (Wayne.)

Strohbn, J. H.—Walcott, Iowa. (Waltham.)
Strong, G.—New Castle, Ind. (Holman.)
Studebaker Bros. Co.—Broadway & 48th St., New York City. (Studebaker.)
Studebaker Bros. Co. of California.—Market & 10th Sts., San Francisco, Cal. (Studebaker.)
Studebaker Bros. Mfg. Co.—Cor. 15th & Blake Sts., Denver, Colo. (Studebaker.)
Studebaker Bros. Mfg. Co.—378 Wabash Ave., Chicago, Ill. (Studebaker.)
Studebaker Bros. Mfg. Co.—13th & Hickory Sts., Kansas City, Mo. (Studebaker.)
Studebaker Bros. Mfg. Co.—317 Elm St., Dallas, Tex. (Studebaker.)
Studebaker Bros. Co. of Utah.—157 State St., Salt Lake City, Utah. (Studebaker.)
Studebaker Bros. Co., N. W.—330 E. Morrison St., Portland, Ore. (Studebaker.)
Sturges, Percy.—Norwalk, Conn. (Oldsmobile, Cadillac, Pope-Hartford.)
Stutsman & Co., C. B.—Monte Vista, Colo. (Ford, Gale, Reliance, Dayton.) Garage; repairing.
Stuart, Hamilton.—St. Johnsbury, Vt. (Reo.)
Stuart, J. H.—McIndo Falls, Vt. (Reo, Premier); garage; repairing.
Suburban Auto & Garage.—2713-2717 Woodburn Ave., Cincinnati, O. (Queen, Rauch & Lang.)
Success Automobile Co.—420 Pico and Hill Sts., Los Angeles, Cal. (Locomobile, Winton, Isotta, Mercedes, Panhard, Renault, Simplex.)
Suisson Garage Co., Inc.—Main St., Suisson, Solano County, Cal. (Mitchell, Oldsmobile, Winton, Autocar, Maxwell, National.)
Sullivan Auto Co., D. B.—27 N. Capitol Ave., Indianapolis, Ind. (Lambert.)
Sullivan's Auto Garage.—16-18 Myrtle St., Manchester, N. H. (Reo, Ford.)
Summer, S. J.—Indianapolis, Ind. (Holman.)
Summit Automobile Co.—Akron, Ohio. (Cartercar.)
Summit Garage.—Union Place, Summit, N. J. (Reo.)
Summit Motor Car Co.—Smithfield Ave., Summit, N. J. (Ford.)
Superior Auto Co.—130 E. 9th Angeles, Cal. (Haynes.)
Sutherland, R. L.—115 Maryland Indianapolis, Ind. (Glide.)
Sutter & Gamble.—Burlingt (Maxwell.)
Swampscott Auto Co.—Lynn. (Pope-Hartford.)
Swangit, H. E.—Detroit, Kan. (Waltham.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Swartz, J. I., & Co.**—53½ E. Commerce St., Bridgeton, N. J., care of H. W. Garrison. (Rapid.)
- Sweeney, E. E.**—168 3rd Ave., North Nashville, Tenn. (Stevens-Duryea, Maxwell.)
- Sweeney Sporting Goods Co.**—Albany, N. Y. (Waltham.)
- Sweigert, Frank.**—44 W. Mulberry St., Kokomo, Ind. (Ford.)
- Swenson, R. A., Mrs.**—185 Prairie Ave., Providence, R. I. (Indian, Merkel); garage; repairing.
- Swezy, C. L.**—Middletown, N. Y. (Dragon.)
- Swift, Charles I.**—Millbrook, N. Y. (Mitchell.)
- Syracuse Auto Supply Co.**—118-120 S. State St., Syracuse, N. Y. (Maxwell.)
- Syracuse Motor Car Co.**—511 S. Clinton St., Syracuse, N. Y. (Winton, Cadillac.)

T

- Tacoma Automobile Co.**—743 S. Tacoma Ave., Tacoma, Wash. (Franklin.)
- Taft & Co., W. E.**—150 Broadway, Providence, R. I. (Glide.)
- Taggart, B. B.**—Watertown, N. Y. (White.)
- Tallman Stables.**—17 Dill St., Auburn, N. Y. (Rambler.)
- Tamblin, Dr. J. H.**—Copenhagen, N. Y. (Knox.)
- Tampa Automobile & Garage Co., The.**—312 Washington St., Tampa, Fla. (Mitchell.)
- Tampa Cycle Co.**—508 Franklin St., Tampa, Fla. (Cadillac.)
- Tampa Harness & Wagon Co.**—Tampa, Fla. (Pope-Toledo, Pope-Hartford, Pope-Waverley); garage; repairing.
- Tanberg Auto Co.**—River and Gibson Sts., Eau Claire, Wis. (White, Buick, Oldsmobile, Pope-Waverley); garage; repairing.
- Tanberg Auto Co.**—312 State St., La Crosse, Wis. (White.)
- Tansky & Co.**—St. Petersburg, Russia. (Monarch.)
- Tarkio Electric & Water Co.**—Tarkio, Wis. (Pope-Waverley, Waltham); repairing.
- Tarrant, W. P.**—12 Maple Ave., Saratoga, N. Y. (Dolson.)
- Tasker, B. B.**—Minot, N. Dak. (Ford.)
- Tatem & Son, J. B.**—Putnam, Conn. (Knox.)
- Taylor Automobile Co.**—33 Orange St., Albany, N. Y. (Locomobile); garage; repairing.
- Taylor, James.**—Taylor House, Coatsville, Pa. (Rambler.)
- Taylor, L. D.**—Brattleboro, Vt. (Cadillac.)

- Taylor, L. J.**—Earlville, Ill. (Reo, Premier.)
- Taylor, Wade A.**—Niles, Ohio. (Pope-Hartford.)
- Teagarden & Pull.**—Goshen, Ind. (Rauch & Lang.)
- Temple Auto Co., Ralph.**—1219-1221 Michigan Ave., Chicago, Ill. (National, Jackson, Pullman, Temple, Marvel, Rapid.)
- Temple Auto Co.**—Temple, Tex. (Holzman, Rapid.)
- Templeton, D. F.**—Montgomery House, Morristown, Pa. (Maxwell.)
- Tennant Motor, Ltd.**—1449 Michigan Ave., Chicago, Ill. (Peerless, Mercedes.)
- Tenvoorde, J. H.**—Minneapolis, Minn. (Deere.)
- Terre Haute Auto Co.**—119 S. 7th St., Terre Haute, Ind. (Packard, Cadillac, Pope-Waverley, Maxwell.)
- Testard, H. A.**—341 St. Charles St., New Orleans, La. (Buick, Pope-Toledo, Cadillac.)
- Teves & Hendricks.**—411 Berry St., Brooklyn, N. Y. (Smith.)
- Tew, B. T.**—Hempstead, N. Y. (Haynes.)
- Texas Auto Transit Co.**—San Antonio, Tex. (Rapid.)
- Thayer, F. E.**—1028 S. Main St., Los Angeles, Cal. (Darracq.)
- Thiesen, Fred.**—Chilton, Wis. (Jewel.)
- Tholen Bros.**—304 Shawnee St., Leavenworth, Kan. (Cadillac.)
- Thomas & Bros., G. P.**—Batavia, N. Y. (Waltham, Pierce Arrow.)
- Thomas & Lowe Machine Co.**—Sabin & West Exchange Sts., Providence, R. I. (Autocar, Pope-Toledo.)
- Thomas & Talman Auto Co.**—1828 L St., N. W., Washington, D. C. (Pullman.)
- Thomas Motor Co., E. R.**—Retail Dept., 1200 Niagara St., Buffalo, N. Y. (Thomas Flyer.)
- Thomas Detroit Co., E. R.**—Harper Ave. & Dequindre St., Detroit, Mich. (Thomas Detroit.)
- Thomas, F. C.**—Pomona, Cal. (Maxwell.)
- Thomasville Iron Works.**—331 Jackson St., Thomasville, Ga. (Reo, Ford.)
- Thompson & Co.**—State & Whitaker Sts., Savannah, Ga. (Maxwell, Reo, Rambler.)
- Thompson & Lipcomb.**—Washington St., Lacon, Ill. (Jackson.)
- Thompson, T. E.**—Canostota, N. Y. (Maxwell.)
- Tibbetts, N. H.**—Groveton, N. H. (Lambert.)
- Thomson Co., Robert.**—254 Court St., Rochester, N. Y. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Throon & Sons, J. E.—Trenton, N. J. (Winton.)
Thornhill Co., H. W.—Dallas, Tex. (Rapid.)
Thornhill, W. C.—Minneapolis, Minn. (Frayer-Miller, Reo.)
Thorpe, B. E.—117 W. 16th St., San Francisco, Cal. (Jewel.)
Thurlow, J. A.—10th & Delaware Sts., Wilmington, Del. (Queen.)
Tierney, S. P.—147 Main St., Springfield, Mass. (Cameron.)
Tiffin Cycle & Auto Co.—Tiffin, Ohio. (Pope-Waverley.)
Times Square Automobile Co.—1599-1601 Broadway, New York. (Second-hand cars); garage; repairing.
Tioga Auto Co.—Broad & Tioga Sts., Philadelphia, Pa. (National.)
Tippecanoe Auto Co.—112-114 N. 5th St., Lafayette, Ind. (Reo, Jackson, Overland.)
Tippel, Alfred Josef.—Wien Oeslerreich, 111, Linzerstrasse, Vienna, Austria-Hungary. (Lambert.)
Titman, Leeds & Co.—128 N. Broad St., Philadelphia, Pa. (Matheson, Studebaker.)
Todd, James B.—322 Peachtree St., Atlanta, Ga. (Stoddard-Dayton); garage; repairing.
Toepfer's Sons, Frank.—413 National Ave., Milwaukee, Wis. (Earl.)
Toledo Motor Boat & Power Co.—Toledo, Ohio. (Haynes.)
Toledo Motor Car Co.—1012 Madison Ave., Toledo, Ohio. (Columbia, Winton, American Mercedes, Pope-Toledo, Baker.)
Tollerton, I. G.—Alliance, O. (Jewel.)
Tollner & Sons, B.—292 Taaffe Pl., Brooklyn, N. Y. (Baker.)
Toman Bros.—Trenton, N. J. (Rambler.)
Tompkins, Dr. Geo. J.—701 Church St., Lynchburg, Va. (Maxwell.)
Torrey, E. S.—Rockland, Mass. (Cadillac.)
Torgler, E. R.—Toledo, O. (Jewel.)
Torgorah, John.—Gottenborg, Sweden. (Northern.)
Toronto Automobile Co.—6 Adelaide St., Toronto, Canada. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
Tower & Son, J. D.—Mendota, Ill. (National.)
Towle & Co., E. H.—25 W. Main St., Waterbury, Conn. (Franklin, Locomobile, Cadillac); garage; repairing; supplies.
Townsend, Arthur R.—1148 Bedford Ave., Brooklyn, N. Y. (Knox.)
Townsend, G. M.—Maryville, Mo. (Earl.)

Toyah Rapid Transit Co.—Toyah, Tex. (Buick.)
Trabold, A.—217 Woodwale Ave., Johnstown, Pa. (Mitchell.)
Tragardh, John.—Gottenburg, Sweden. (Northern.)
Trainer & Co., T. W.—Cambridge Bldg., Chester, Pa. (Glide, Jackson.)
Traver, Judson D.—Rhinebeck, N. Y. (Waltham.)
Travis Auto Co., C. W.—Main St., Evansville, Ind. (Buick, Pope-Waverley, Cadillac.)
Treacy & Pierce.—Roanoke Rapids, N. C. (Waltham.)
Treadway, W. S.—Norwood, Ohio. (Wayne.)
Treat & Clark.—25 Palm St., Bangor, Me. (Mitchell, Jackson, Logan, Maxwell.)
Treat, S. W.—Atlantic, Iowa. (Mason.)
Trecker & Sons, C.—Odell, Ill. (Rambler, Reo, Premier, Buick.)
Trenery & Co., C. L.—Block No. 4, Le Mars, Ia. (Gale, Queen, Olds); repairing.
Trimble, G. T.—Ellsworth, Kan. (Northern.)
Trimmer, Dr. E. D.—High Bridge, N. Y. (Maxwell.)
Triple State Electric Co.—McFarland St., Charleston, W. Va. (Pope-Waverley.)
Trojan Button Fastner Co.—594 River St., Troy, N. Y. (Queen, Gale.)
Trowbridge, A.—17 South St., Morristown, N. J. (Reo, Premier); garage; repairing.
Troy & Albany Auto Exchange.—State & Larke Sts., Albany, N. Y. (Franklin.)
Troy Auto Exchange.—22 4th St., Troy, N. Y. (Buick, Pierce Arrow, Pope-Toledo, Franklin.)
Troy Carriage Works.—145 3rd Ave., Troy, N. Y. (Wayne, Mitchell, Chadwick.)
Trowbridge, F. A.—17 South St., Morristown, N. J. (Reo.)
Trumbauer, W.—832 Delaware Ave., Bethlehem, Pa. (Ford.)
Tubbs, Dr. R. B.—Council Bluffs, Iowa. (Holsman.)
Tucker, Geo.—Brattleboro, Vt. (Cartercar.)
Tucker, J. P.—Wiscasset, Me. (Haynes.)
Tulane Automobile Co.—433 Perdido St., New Orleans, La. (Royal.)
Turnbull, G. A.—Princeton, Ill. (Modeline); garage; repairing.
Turner, F. A.—Sandwich, Ill. (Holsman.)
Turrell & Co., H. M.—17-19 Jefferson St., Waterbury, Conn. (Rambler.)
Tuthill, R. S.—Unionville, N. Y. (Holsman.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Twenty-Second Street Garage.**—Toledo, Ohio. (Ford.)
Twentieth Century Motor Car Co.—121-125 S. Lafayette St., South Bend, Ind. (Buick); garage; repairing.
Twining Co., Thos. W.—326 N. Broad St., Philadelphia, Pa. (Crawford, Marion.)
Tyler & Sweezy.—Junction City, Kan. (Rambler, Premier.)
Tyrrell, Geo. H.—2862 Webster Ave., New York City. (White.)
Tyrone Motor Car Co.—Tyrone, Pa. (Rapid.)

U

- Union Auto Co.**—Washington, D. C. (Elmore.)
Union Auto Co.—1651 Elk St., Bellingham, Wash. (Winton, Cadillac, Auto-car.)
Union Automobile Co.—521 Homewood Ave., Pittsburg, Pa. (Panhard, Renault.)
Union Auto Co.—Bull's Ferry Rd. and Main St., Union Hill, N. J. (National, Rambler.)
Union Auto Garage Co.—35 S. College St., Akron, Ohio. (Buick, Pope-Toledo, Thomas Flyer.)
Union Garage.—Pasadena, Cal. (Ford.)
Union Light & Power Co.—St. Louis, Mo. (Rauch & Lang, Studebaker, Columbia Electric); garage; repairing.
United Motor Car Co.—6112 Euclid Ave., Cleveland, Ohio. (Dragon.)
U. S. Automobile Co.—21 Plymouth Ave., Rochester, N. Y. (Locomobile, Stearns, Stevens-Duryea, Pierce Arrow); garage; repairing; supplies.
University Auto Co.—30 Carlton St., Rochester, Pa. (Mitchell.)
University Garage Co.—St. John & Olive Sts., New Haven, Conn. (Wayne); garage; supplies.
Updike, C. O.—145 E. Main St., Lexington, Ky. (Rambler); garage; repairing; supplies.
Upham Co., U. J.—Duluth, Minn. (Waltham.)
Up-to-Date Garage.—1141 1st St., San Diego, Cal. (Reo.)
Ure & Co., John, Jr.—172 12th St., Milwaukee, Wis. (Marmon.)
Urquhart, A. S.—Calgary, Alta, Canada. (Matheson, Northern.)
Utah Automobile Co.—57 Market St., Salt Lake City, Utah. (Pope-Toledo.)
Utica Cycle Co.—21 Columbus St., Utica, N. Y. (Rambler.)
Utica Motor Car Co.—333-337 Bleeker St., Utica, N. Y. (Buick, Peerless, Pierce Arrow, Thomas Flyer, Baker, Cadillac, Darracq); garage; repairs. supplies.

- Urquiza, M. M.**—Queretaro, Mexico. (Holsman.)

V

- Vaala & Nutwig.**—Sande, Ia. (Holsman.)
Vale, Harry M.—736 Broad St., Beloit, Wis. (Rambler.)
Valley Automobile Co.—133 E. Market St., Warren, Ohio. (Cadillac, Baker, Pope-Hartford, Pope-Toledo.)
Van Allen, W. C.—Mechanic St., Boonton, N. J. (Reo, Cadillac.)
Van Alstyne, T. B.—25 W. 42nd St., New York City. (Dolson.)
Van Automobile Co.—4706 Washington Ave., St. Louis, Mo. (Cleveland, Stoddard-Dayton, Marmon.)
Van Amberg, C. E.—118 N. Front St., Kingston, N. Y. (Maxwell.)
Van Benscheten, John.—273 Main St., Poughkeepsie, N. Y. (Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Mitchell, Lozier); garage; repairing; supplies.
Vancouver Auto & Bicycle Co.—Vancouver, Canada. (Oldsmobile.)
Vandecar, W. D.—157 N. Ottawa St., Grand Rapids, Mich. (Reo, Glide); garage; repairing.
Vanderslice, C. M.—185 Hanover St., Pottstown, Pa. (Cadillac.)
Vanderbilt, H. M.—Suffern, N. Y. (Haynes.)
Vandever & Co., H. W.—807 Market Pl., Wilmington, Del. (Pope-Hartford.)
Van Duzen Kehm Motor Car Co.—Birmingham, Ala. (Reo, Rambler.)
Van Fenen & Co.—Billings, Mont. (Winton.)
Van Fleet Mfg. Co.—Joliet, Ill. (Atlas.)
Van Meter, H.—Glen Ellen, Cal. (Waltham.)
Van Ness Garage.—Rear Van Ness House, Burlington, Vt. (Reo, Premier, Rapid.)
Van Schaick, C. D.—Mt. Vernon, N. Y. (Covert.)
Vanstone, C. Co.—Bridgeport, Conn. (Knox.)
Van Schaick, C. D.—74 Beaver St., New York City. (Covert.)
Van Warts Garage.—Palisade Ave., Englewood, N. J. (Reo, Maxwell, Studebaker, Crawford); garage; repairing.
Van Wye, John E.—Willis, O. (Maxwell.)
Varley, W. P.—Van Brunt St., Englewood, N. J. (Franklin.)
Varney, W. M.—Long Beach, Cal. (Pope-Waverley, Maxwell.)
Velo, Angel.—Havana, Cuba. (Queen.)
Venango Auto Station.—Franklin, Pa. (White.)
Vent, Eugene.—Mexico City, Mex. (Royal.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Vicory, Chas. A.**—R. F. D. 2, Hornet, Mo. (Holsman.)
Victor Automobile Co.—809 Massachusetts Ave., Indianapolis, Ind. (Marvel, Dragon.)
Virginia Motor Car Co.—Roanoke, Va. (Maxwell.)
Voegelley, Charles.—Tecumseh, Mich. (Cadillac.)
Volkel, Wm.—Perrysville, Ind. (Holsman.)
Vonder Linden, H.—52 Market St., Poughkeepsie, N. Y. (Rambler.)
Von Hamm Young Co.—Honolulu, Hawaiian Islands. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, White Peerless, Autocar, Maxwell); garage; repairing.
Vrooman Bros.—1259 State St., Schenectady, N. Y. (Elmore, Waltham, Haynes); garage; repairing.
Vuille, Chas. A.—819 Washington St., Huntington, Pa. (Cadillac, Franklin.)

W

- Wabash Auto & Electric Co.**—Terre Haute, Ind. (Jackson.)
Wachtell & Sons, C. S.—Muncie, Ind. (Cadillac.)
Wagner, H. G.—17th & U St., N. W., Washington, D. C. (Winton.)
Wagner, John.—339 Main St., Streator, Ill. (Buick.)
Wahlman, S. J.—Ashpeming, Mich. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
Waite, F. E.—Oshkosh, Wis. (Mitchell.)
Waite, Geo. W.—Albany, N. Y. (Elmore.)
Wakeman, W. R.—Dalton, N. Y. (Waltham.)
Walker, J. G.—San Angelo, Tex. (Buick.)
Walker, Mrs. W. K.—Burlington, Vt. (Elmore.)
Wallace & Sons, V.—Salisbury, N. C. (Pope-Hartford.)
Wallace Bros. Co.—46 Ma'n St., New Rochelle, N. Y. (Maxwell); garage; repairs; supplies.
Wallace Buggy Co.—Chattanooga, Tenn. (Elmore, Stoddard-Dayton.)
Wallace, E. N.—Main and Carlisle Sts., Hemlock, Ind. (Haynes.)
Wallace, G. S.—Port Allegany, Pa. (Maxwell.)
Wallace, R. L.—San Jose, Cal. (Waltham.)
Walley, Wm. C.—Morris, Ill. (Rambler.)
Walsh, Robert.—Charles City, Iowa. (Rambler.)
Walter Auto Co.—49 W. 66th St., New York City. (Walter.)
Walter Automobile Co. of New York.—Fred Kuser, Manager. (Walter.)

- Walters & Burger.**—Woodstock, Ill. (Rambler.)
Walter, Frank.—Montgomery Hall, Staunton, Va. (Autocar.)
Waltham Mfg. Co.—1615 Broadway, cor. 49th St., New York City. (Waltham touring cars, Waltham buckboards and delivery wagons); repairing.
Waltham Motor Car Co.—443 Wabash Ave., Chicago, Ill. (Waltham.)
Wanamaker, John.—Philadelphia, Pa. (Merkel.)
Wanamaker, John.—New York City. (Merkel.)
Ward, Frank.—404 S. Water St., Rockford, Ill. (Winton.)
Ware & Floren.—Lakota, N. Dak. (Premier.)
Warfel & Arbuckle.—1601 State St., Erie, Pa. (Waltham, Pope-Waverley); repairing.
Warminster Motor Co., Ltd.—Warminster, England. (Wayne.)
Warner & Co., C. P.—1502 Michigan Ave., Chicago, Ill. (Moline.)
Warner, G. E.—438 S. Salina St., Syracuse, N. Y. (Thomas Flyer.)
Warneck Co., Wm.—324 4th St., Sioux City, Ia. (Ford, Rambler, Maxwell.)
Warren, Geo. R.—Main St., Middle Alley, Slatington, Pa. (Waltham.)
Warren Motor Car Co.—Warren, Ohio. (Ford.)
Warren, W. A.—Pittsburg, Pa. (Dolson.)
Warsaw Auto Garage & Machine Works.—Warsaw, N. Y. (Winton, Cadillac, Autocar.)
Warwick, J. G. & Co.—5971 Center Ave., Pittsburg, Pa. (Jewel.)
Wasatch Auto Co.—Salt Lake City, Utah. (Thomas Flyer.)
Washington Automobile Co.—7th & Pacific Sts., Tacoma, Wash. (Ford, Jackson, Mitchell.)
Washington Automobile Co.—67-69 E. Maiden St., Washington, Pa. (Franklin.)
Washington Garage.—3918 Washington Blvd., St. Louis, Ill. (Pierce Arrow, Peerless, Winton.)
Wasem & Beals.—Eagle Grove, Iowa. (Waltham.)
Wasson Co.—Lincoln, Ill. (Pope-Waverley.)
Waterloo Automobile Co.—V. N. Y. (Buick, Marmon.)
Waterman Bros. Co., Inc.—1222 St., Fresno, Cal. (Cadillac, White)
Waters, Elmer R.—South Raub, (Haynes.)
Watertown Auto & Supply C town, N. Y. (Matheson.)
Waterville Motor Co.—245 Waterville, Me. (Reo, Lambert.)
Watkins, J. W.—Mt. Carmel, Pa. (M well.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Watson Bros.**—Marinette, Wis. (Waltham.)
- Watson, Coleman.**—290 Broad St., Lynn, Mass. (White.)
- Watson, J. C.**—Scales Mound, Ill. (Waltham.)
- Watters, John S.**—233 Baronne St., New Orleans, La. (Wayne.)
- Watts, Harry.**—Logansport, Ind. (Lambert.)
- Waukegan Motor Car Co.**—119 S. Sheridan Rd., Waukegan, Ill. (Elmore.)
- Waverley Electric Auto Co.**—Charleston, S. C.—(Pope-Waverley.)
- Wayne Auto Agency.**—507 Mutual Life Bldg., Seattle, Wash. (Wayne.)
- Wayne Garage.**—33 Grant Sq., Brooklyn, N. Y. (Wayne.)
- Wayne Motor Co.**—1337 Michigan Ave., Chicago, Ill. (Wayne.)
- Weatherford Electric Co.**—Weatherford, Tex. (Holsman.)
- Weaver, C. H.**—255 Elm St., Oil City, Pa. (Buick, Oldsmobile, Royal.)
- Weaver, H. C.**—Portsmouth, N. H. (Maxwell.)
- Weaver, J. C.**—720 S. Main St., Akron, O. (Queen.)
- Webb, Clarence R.**—San Angelo, Tex. (Cameron.)
- Webb & Son, W. H.**—316 State St., Conneaut, O. (Rambler.)
- Weber Co., Orlando F.**—1322 Michigan Ave., Chicago, Ill. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Weber, W. H.**—Detroit, Mich. (Rambler.)
- Weed Garage.**—233 Ontario St., Toledo, Ohio. (Columbus.)
- Weeks, C. M.**—Babylon, N. Y. (Cadillac.)
- Weeks, S. J.**—622 G St., Washington, D. C. (Lambert.)
- Wehrly, H. A.**—New Paris, Ohio. (Waltham.)
- Weisel, P. J.**—Anaheim, Cal. (Moline, Ford, Maxwell.)
- Welch, Andrew.**—Aurora, Ill. (Cadillac.)
- Welch Motor Co.**—1871 Broadway, New York City. (Welch); repairing Welch cars.
- Welch Bros. Motor Car Co.**—Grand St., Milwaukee, Wis. (Packard, Pope-Hartford, Buick, garage; repairing; supplies.)
- Wentworth Garage.**—826 7th Ave., New York City. Second-hand cars.
- Wentworth, J. A.**—Manchester, N. H. & Lang.)
- Wentworth, W.**—1013 14th St., N. W., Washington, D. C. (National.)
- Wentworth, Prince.**—814 Fourth Ave., Louisville, Ky. (Rambler.)
- Wentworth Auto Station.**—Central Ave., Dover, N. H. (Reo, Premier, Wayne); garage; repairing.
- Wentworth Garage.**—6346 Wentworth Ave., Chicago, Ill. (Cartercar.)
- Wentworth Motor Car Co.**—1406-1408 Euclid Ave., Cleveland, O. (Mors.)
- Werant & Rembe.**—Haverstraw, N. Y. (Ford.)
- Wener, Geo. J.**—Rye, N. Y. (Maxwell.)
- Wertzig & Vernet.**—Concordia, Kan. (Waltham.)
- Wert Motor Car Co.**—Van Wert, Ohio. (Ford, Rambler, Maxwell.)
- West Barnstable Motor Co.**—West Barnstable, Mass. (Logan, Commercial.)
- West Coast Auto Co.**—1008 Florida Ave., Tampa, Fla. (Maxwell.)
- West Coast Motor Car Co.**—387 Golden Gate Ave., San Francisco, Cal. (Darracq.)
- West Chester Garage.**—118 W. Main St., West Chester, Pa. (Autocar, Winton.)
- West End Auto & Machine Co.**—72 W. Main St., Stamford, Conn. (Maxwell.)
- Western Automobile Co.**—Calgary, Alta, Canada. (Logan.)
- Western Auto Co.**—4701 Washington Blvd., St. Louis, Mo. (Winton, Pierce Arrow.)
- Western Auto Co.**—Denver, Colo. (Wayne.)
- Western Automobile Co.**—384 Cedar St., St. Paul, Minn. (Winton, Woods, Pope-Toledo, Franklin.)
- Western Automobile & Supply Co.**—115 N. Cascade Ave., Colorado Springs, Colo. (Oldsmobile, Columbus, Franklin, Peerless.)
- Western Auto Supply Co.**—414-416 3rd Ave., Cedar Rapids, Ia. (Glide, Mitchell, Reo.)
- Western Motor Car Co.**—Sturgis, Mich. (Knox.)
- Western Motor Car Co.**—Lincoln, Cal. (Maxwell, Rambler.)
- Western Motor Car Co.**—1412-14, Michigan Ave., Chicago, Ill. (Stearns.)
- Western Motor Car Co.**—1004-1006 K St., Sacramento, Cal. (Jewel, Reo, Stoddard Dayton, Maxwell.)
- Western Motor Car Co.**—415 S. Hill St., Los Angeles, Cal. (Packard, Thomas, Stevens-Duryea); garage; repairing.
- Western Realty & Loan Co.**—Glen Ulen, N. Dak. (Buick.)
- West, Geo. Jr.**—Ballston Spa, N. Y. (Simplex.)
- Westing, G. H. Co.**—219 Massachusetts Ave., Indianapolis, Ind. (Indian.)
- West Side Motor Co.**—Hamilton, Ohio. (Wayne.)
- West-Stillman Motor Car Co.**—153 N. Broad St., Philadelphia, Pa. (Pennsylvania, Mercedes.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Vicory, Chas. A.**—R. F. D. 2, Hornet, Mo. (Holsman.)
Victor Automobile Co.—809 Massachusetts Ave., Indianapolis, Ind. (Marvel, Dragon.)
Virginia Motor Car Co.—Roanoke, Va. (Maxwell.)
Voegeley, Charles.—Tecumseh, Mich. (Cadillac.)
Volkel, Wm.—Perrysville, Ind. (Holsman.)
Vonder Linden, H.—52 Market St., Poughkeepsie, N. Y. (Rambler.)
Von Hamm Young Co.—Honolulu, Hawaiian Islands. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, White Peerless, Autocar, Maxwell); garage; repairing.
Vrooman Bros.—1259 State St., Schenectady, N. Y. (Elmore, Waltham, Haynes); garage; repairing.
Vuille, Chas. A.—819 Washington St., Huntington, Pa. (Cadillac, Franklin.)

W

- Wabash Auto & Electric Co.**—Terre Haute, Ind. (Jackson.)
Wachtell & Sons, C. S.—Muncie, Ind. (Cadillac.)
Wagner, H. G.—17th & U St., N. W., Washington, D. C. (Winton.)
Wagner, John.—339 Main St., Streator, Ill. (Buick.)
Wahlman, S. J.—Ashpeming, Mich. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
Waite, F. E.—Oshkosh, Wis. (Mitchell.)
Waite, Geo. W.—Albany, N. Y. (Elmore.)
Wakeman, W. R.—Dalton, N. Y. (Waltham.)
Walker, J. G.—San Angelo, Tex. (Buick.)
Walker, Mrs. W. K.—Burlington, Vt. (Elmore.)
Wallace & Sons, V.—Salisbury, N. C. (Pope-Hartford.)
Wallace Bros. Co.—46 Main St., New Rochelle, N. Y. (Maxwell); garage; repairs; supplies.
Wallace Buggy Co.—Chattanooga, Tenn. (Elmore, Stoddard-Dayton.)
Wallace, E. N.—Main and Carlisle Sts., Hemlock, Ind. (Haynes.)
Wallace, G. S.—Port Allegany, Pa. (Maxwell.)
Wallace, R. L.—San Jose, Cal. (Waltham.)
Walley, Wm. C.—Morris, Ill. (Rambler.)
Walsh, Robert.—Charles City, Iowa. (Rambler.)
Walter Auto Co.—49 W. 66th St., New York City. (Walter.)
Walter Automobile Co. of New York.—Fred Kuser, Manager. (Walter.)

- Walters & Burger.**—Woodstock, Ill. (Rambler.)
Walter, Frank.—Montgomery Hall, Staunton, Va. (Autocar.)
Waltham Mfg. Co.—1615 Broadway, cor. 49th St., New York City. (Waltham touring cars, Waltham buckboards and delivery wagons); repairing.
Waltham Motor Car Co.—443 Wabash Ave., Chicago, Ill. (Waltham.)
Wanamaker, John.—Philadelphia, Pa. (Merkel.)
Wanamaker, John.—New York City. (Merkel.)
Ward, Frank.—404 S. Water St., Rockford, Ill. (Winton.)
Ware & Floren.—Lakota, N. Dak. (Premier.)
Warfel & Arbuckle.—1601 State St., Erie, Pa. (Waltham, Pope-Waverley); repairing.
Warminster Motor Co., Ltd.—Warminster, England. (Wayne.)
Warner & Co., C. P.—1502 Michigan Ave., Chicago, Ill. (Moline.)
Warner, G. E.—438 S. Salina St., Syracuse, N. Y. (Thomas Flyer.)
Warneck Co., Wm.—324 4th St., Sioux City, Ia. (Ford, Rambler, Maxwell.)
Warren, Geo. R.—Main St., Middle Alley, Slatington, Pa. (Waltham.)
Warren Motor Car Co.—Warren, Ohio. (Ford.)
Warren, W. A.—Pittsburg, Pa. (Dolson.)
Warsaw Auto Garage & Machine Works.—Warsaw, N. Y. (Winton, Cadillac, Autocar.)
Warwick, J. G. & Co.—5971 Center Ave., Pittsburg, Pa. (Jewel.)
Wasatch Auto Co.—Salt Lake City, Utah. (Thomas Flyer.)
Washington Automobile Co.—7th & Pacific Sts., Tacoma, Wash. (Ford, Jackson, Mitchell.)
Washington Automobile Co.—67-69 E. Maiden St., Washington, Pa. (Franklin.)
Washington Garage.—3918 Washington Blvd., St. Louis, Ill. (Pierce Arrow, Peerless, Winton.)
Wasem & Beals.—Eagle Grove, Iowa. (Waltham.)
Wasson Co.—Lincoln, Ill. (Pope-Waverley.)
Waterloo Automobile Co.—Watertown, N. Y. (Buick, Marmon.)
Waterman Bros. Co., Inc.—1222 St., Fresno, Cal. (Cadillac, White.)
Waters, Elmer R.—South Raub, (Haynes.)
Watertown Auto & Supply Co.—Watertown, N. Y. (Matheson.)
Waterville Motor Co.—245 Main St., Waterville, Me. (Reo, Lambert.)
Watkins, J. W.—Mt. Carmel, Pa. (Maxwell.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

Watson Bros.—Marinette, Wis. (Waltham.)
Watson, Coleman.—290 Broad St., Lynn, Mass. (White.)
Watson, J. C.—Scales Mound, Ill. (Waltham.)
Watters, John S.—233 Baronne St., New Orleans, La. (Wayne.)
Watts, Harry.—Logansport, Ind. (Lambert.)
Waukegan Motor Car Co.—119 S. Sheridan Rd., Waukegan, Ill. (Elmore.)
Waverley Electric Auto Co.—Charleston, S. C. (Pope-Waverley.)
Wayne Auto Agency.—507 Mutual Life Bldg., Seattle, Wash. (Wayne.)
Wayne Garage.—33 Grant Sq., Brooklyn, N. Y. (Wayne.)
Wayne Motor Co.—1337 Michigan Ave., Chicago, Ill. (Wayne.)
Weatherford Electric Co.—Weatherford, Tex. (Holsman.)
Weaver, C. H.—255 Elm St., Oil City, Pa. (Buick, Oldsmobile, Royal.)
Weaver, H. C.—Portsmouth, N. H. (Maxwell.)
Weaver, J. C.—720 S. Main St., Akron, O. (Queen.)
Webb, Clarence R.—San Angelo, Tex. (Cameron.)
Webb & Son, W. H.—316 State St., Conneaut, O. (Rambler.)
Weber Co., Orlando F.—1322 Michigan Ave., Chicago, Ill. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
Weber, W. H.—Detroit, Mich. (Rambler.)
Weed Garage.—233 Ontario St., Toledo, Ohio. (Columbus.)
Weeks, C. M.—Babylon, N. Y. (Cadillac.)
Weeks, S. J.—622 G St., Washington, D. C. (Lambert.)
Wehrly, H. A.—New Paris, Ohio. (Waltham.)
Weisel, P. J.—Anaheim, Cal. (Moline, Ford, Maxwell.)
Welch, Andrew.—Aurora, Ill. (Cadillac.)
Welch Motor Co.—1871 Broadway, New York City. (Welch); repairing Welch cars.
Welch Bros. Motor Car Co.—Grand .. cor. 7th St., Milwaukee, Wis. (Oldsmobile, Packard, Pope-Hartford, Olds); garage; repairing; supplies.
Garage.—826 7th Ave., New York. Second-hand cars.
J. A.—Manchester, N. H. & Lang.)
W.—1013 14th St., N. W., Washington, D. C. (National.)
Prince.—814 Fourth Ave., Louisville, Ky. (Rambler.)

Wentworth Auto Station.—Central Ave., Dover, N. H. (Reo, Premier, Wayne); garage; repairing.
Wentworth Garage.—6346 Wentworth Ave., Chicago, Ill. (Cartercar.)
Wentworth Motor Car Co.—1406-1408 Euclid Ave., Cleveland, O. (Mors.)
Werant & Rembe.—Haverstraw, N. Y. (Ford.)
Wener, Geo. J.—Rye, N. Y. (Maxwell.)
Wertzig & Vernet.—Concordia, Kan. (Waltham.)
Wert Motor Car Co.—Van Wert, Ohio. (Ford, Rambler, Maxwell.)
West Barnstable Motor Co.—West Barnstable, Mass. (Logan, Commercial.)
West Coast Auto Co.—1008 Florida Ave., Tampa, Fla. (Maxwell.)
West Coast Motor Car Co.—387 Golden Gate Ave., San Francisco, Cal. (Darracq.)
West Chester Garage.—118 W. Main St., West Chester, Pa. (Autocar, Winton.)
West End Auto & Machine Co.—72 W. Main St., Stamford, Conn. (Maxwell.)
Western Automobile Co.—Calgary, Alta, Canada. (Logan.)
Western Auto Co.—4701 Washington Blvd., St. Louis, Mo. (Winton, Pierce Arrow.)
Western Auto Co.—Denver, Colo. (Wayne.)
Western Automobile Co.—384 Cedar St., St. Paul, Minn. (Winton, Woods, Pope-Toledo, Franklin.)
Western Automobile & Supply Co.—115 N. Cascade Ave., Colorado Springs, Colo. (Oldsmobile, Columbus, Franklin, Peerless.)
Western Auto Supply Co.—414-416 3rd Ave., Cedar Rapids, Ia. (Glide, Mitchell, Reo.)
Western Motor Car Co.—Sturgis, Mich. (Knox.)
Western Motor Car Co.—Lincoln, Cal. (Maxwell, Rambler.)
Western Motor Car Co.—1412-14, Michigan Ave., Chicago, Ill. (Stearns.)
Western Motor Car Co.—1004-1006 K St., Sacramento, Cal. (Jewel, Reo, Stodard Dayton, Maxwell.)
Western Motor Car Co.—415 S. Hill St., Los Angeles, Cal. (Packard, Thomas, Stevens-Duryea); garage; repairing.
Western Realty & Loan Co.—Glen Ulen, N. Dak. (Buick.)
West, Geo. Jr.—Ballston Spa, N. Y. (Simplex.)
Westing, G. H. Co.—219 Massachusetts Ave., Indianapolis, Ind. (Indian.)
West Side Motor Co.—Hamilton, Ohio. (Wayne.)
West-Stillman Motor Car Co.—153 N. Broad St., Philadelphia, Pa. (Pennsylvania, Mercedes.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Wever, H. C.**—Portsmouth, N. H. (Maxwell.)
- Wetmore, H. A.**—Athon, Iowa. (Wal-
tham.)
- Weygant Sons, R. F.**—Central Valley,
N. Y. (Maxwell.)
- Weygant, W. M.**—Tuxedo Park, N. Y.
(Maxwell, Mitchell.)
- Wheelan, J. D.**—Care Dallas Auto Co.,
Dallas, Tex. (Thomas Flyer.)
- Wheeler, O. D.**—19 Maple St., Marlboro,
Mass. (Moline, Pope-Hartford.)
- Wheeler, C. F.**—Vilas, Colo. (Wal-
tham.)
- Wheeler, W. L.**—Menasha, Wis. (Buick,
Winton.)
- Wheeling Auto Co.**—"The Auto Inn,"
16th and Eoff Sts., Wheeling, W. Va.
(Cadillac, Frayer-Miller, Rapid, Reo,
Winton.)
- Wheelright, George F.**—488 Broad St.,
Providence, R. I. (Lambert.)
- Whipple, The Motorcycle Man.**—260 W.
Jackson Blvd., Chicago, Ill. (Indian,
Merkel.)
- Whitcomb Auto Co., T. C.**—East 9th
St., Cleveland, Ohio. (Rambler.)
- Whitcomb Auto Co.**—Lynbrook, Long
Island, N. Y. (Maxwell.)
- Whitfield, N. B.**—143 Park St., New Ha-
ven, Conn. (Oldsmobile.)
- White, A. Corydon, Jr.**—640 Main St.,
Springfield, Mass. (White, Stanley.)
- White & Co.**—320 Newbury St., Boston,
Mass. (White.)
- White & Grasswick.**—Calgary, Alta,
Canada. (Marmon, Russell, Rambler.)
- White Agency.**—176 State St., Bing-
hampton, N. Y. (White.)
- White Auto Co.**—11 Dorrance St., Provi-
dence, R. I. (White.)
- White Auto Agency.**—1116 Main St.,
Buffalo, N. Y. (White); garage; sup-
plies.
- White Automobile Co.**—976 N. Main St.,
Columbus, Ohio. (White, Baker.)
- White, Chas.**—Monett, Mo. (Jewel.)
- White Co., The.**—Cleveland, O. (White.)
- White Co.**—Broadway & 62nd St., New
York City. (White.)
- White Co.**—639 N. Broad St., Philadel-
phia, Pa. (White.)
- White Co.**—19 E. 9th St., Cincinnati,
Ohio. (White.)
- White Co., The.**—417 Federal St., Troy,
N. Y. (White.)
- White Co.**—1380 Bedford Ave., Brook-
lyn, N. Y. (White.)
- White Co.**—Railroad Pl., East Orange,
N. J. (White); repairing.
- White Co., The.**—19 E. 9th St., Bellefon-
taine, O. (White.)
- White Co.**—1780 Market St., San Fran-
cisco, Cal. (White.)
- White, Frank.**—Portland, Ind. (Pope-
Hartford.)
- White Garage.**—666 State St., New
Haven, Conn. (White.)
- White Garage.**—Lynn, Mass. (White.)
- White Garage.**—1010 Morton St., Balti-
more, Md. (White); garage.
- White Garage Co.**—240 Michigan Ave.,
Chicago, Ill. (White.)
- White Garage.**—1215 Madison Ave., To-
ledo, Ohio. (White.)
- White Garage.**—487 Rockwell Ave.,
Cleveland, Ohio. (White.)
- White Garage.**—712 S. Broadway, Los
Angeles, Cal. (White, Pope-Hartford,
Pope-Toledo.)
- White, H. A.**—Memphis, Tenn. (Cadil-
lac.)
- White, M. T.**—74 Bridge St., Springfield,
Mass. (Maxwell.)
- White-Savage Auto Co.**—43 S. State St.,
Salt Lake City, Utah. (Cadillac, Math-
eson, Stearns.)
- White Steam Cars.**—21 E. 9th St., Cin-
cinnati, Ohio. (White.)
- Whiting Auto Co., H. E.**—22 Park Sq.,
Motor Mart, Boston, Mass. (Mora.)
- Whiting, C. L.**—591 Main St., Roches-
ter, N. Y. (Buick.)
- Whitman, R. H.**—Powell St., Richford,
Vt. (Ford, Stanley, Waltham.)
- Whitney.**—43 Columbus Ave., Boston,
Mass. (Berliet.)
- Whitney, E. D.**—50 Greene St., Brattle-
boro, Vt. (Stevens-Duryea.)
- Whitney, R. S.**—7 Dunlap St., Bruns-
wick, Me. (Jackson, Logan.)
- Whitten, B. D.**—Great Falls, Mont.
(Holsman.)
- Whitten, C. E.**—40 Central Ave., Lynn,
Mass. (Thomas Flyer.)
- Whitten, Harry E.**—16 Andrew St.,
Lynn, Mass. (Springfield, Rambler.)
- Whitten-Gilmore Co.**—5 Park Sq., Bos-
ton, Mass. (Thomas Flyer.)
- Whitten Motor Car Co.**—Broad & Pot-
ter Sts., Providence, R. I. (Rambler.)
- Whittaker, H. C.**—Wheeling, W. Va.
(Pope-Hartford.)
- Whittington, N. T.**—Cayuga, Ind.
(Holsman.)
- Wichita Automobile Co.**—Topeka, Kan.
(Pope-Hartford.)
- Wichita Automobile Co.**—123-125 South
Laurence Ave., Wichita, Kan. (Reo,
Stoddard-Dayton, Rambler, Maxwell,
Pope-Waverley.)
- Wichita Falls Imp.**
Tex. (Waltham.)
- Wicke, J. A.**—Van H
line); garage; repairi
- Wickersheim, E. T.**—
Santa Ana, Cal. (Jackso
- Wickstrom & Schafer.**
Mo. (Holsman.)
- Widmayer, F. B.**—2312 Broad
York City. (Indian.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Wight, Ed. L.**—Atlanta, Ga. (Pope-Hartford.)
- Wight, W. W.**—Cornwall, Cal. (Rambler); garage.
- Wilcox, Lewis E.**—Main St., cor. Grand Ave., Middletown, N. Y. (Renting.)
- Wilcox, Wallace L.**—Central St., Fall River, Mass. (Franklin.)
- Wilhelm, A. J.**—Prophetstown, Ill. (Waltham.)
- Wilhide, J. L. B.**—2329 Madison Ave., Baltimore, Md. (Atlas, Atlas Trucks, Prayer-Miller.)
- Wilkerson, Geo. S.**—Youngstown, Ohio. (Rauch & Lang.)
- Wilksburg Automobile Garage.**—819 Hay St., Pittsburg, Pa. (Elmore.)
- Wilkinson & Co., F. W.**—Manchester, England. (Stanley.)
- Wilkins, E. J.**—Gloversville, N. Y. (Atlas.)
- Willard Auto Station.**—400 14th St., Washington, D. C. (Dolson, Jackson.)
- Willard Co., H. J.**—18 Forest Ave., Portland, Me. (Packard, Elmore, Cadillac, Franklin, Winton.)
- Willard Co., H. J.**—48 Ash St., Lewiston, Me. (Cadillac, Winton.)
- Williams & Sons, J. C.**—Orange, Cal. (Reo.)
- William & Son, J. J.**—109 Main St., Montpelier, Vt. (Buick, Pope-Hartford.)
- Williams Auto Co., R. O.**—621-623 Broad St., Columbus, O. (Stearns.)
- Williamsburg Automobile & Storage Co.**—159 Clymer Ave., Brooklyn, N. Y. (Autocar); garage.
- Williams, Harvey R.**—Lancaster, Pa. (Queen.)
- Williams, J. H.**—Monroe, Wis. (Jewel.)
- Williams, John.**—464 Pleasant St., Fall River, Mass. (Reo.)
- Williams, T. J.**—Des Moines, Iowa. (Holsman.)
- Williamson, W. S.**—228 Clifton Pl., Brooklyn, N. Y. (Holsman.)
- Williamsport Auto Exchange.**—599 W. 3rd St., Williamsport, Pa. (Maxwell, Premier, White.)
- Willow Street Motor Car Repair Co.**—Willow St., Fitchburg, Mass. (Rambler.)
- 84 Court St., Auburn, Mass. (Holsman.)
- Wagonage.**—Flatbush & Ocean Aves., Brooklyn, N. Y. (Marmon.)
- Wagon Auto Co.**—Delaware & 10th Streets, Wilmington, Del. (Autocar, Winton.)
- Crew Motor Car Co.**—119 Main St., Elmira, N. Y. (Rambler, White, Marmon, Pope-Waverley, Ford, American); garage; repairs; supplies.

- Wilson & Co.**—117 Craig St., West Montreal, Canada. (Buick, Babcock, Pierce Arrow, Rapid, Franklin.)
- Wilson Auto Co.**—Montreal, Canada. (Rapid, Knox.)
- Wilson Auto Co.**—142 Bank St., Ottawa, Canada. (Franklin, Pierce Arrow, Stoddard-Dayton.)
- Wilson, A. H.**—2nd & Market Sts., Canton, Ohio. (Cadillac, Winton, Northern.)
- Wilson Automobile Co.**—118 St. Lawrence Ave., Wichita, Kan. (Northern, Stearns.)
- Wilson, A. T.**—1548 Broadway, Denver, Col. (Ford, Columbus, Dragon.)
- Wilson, A. S.**—23 Cooper St., Woodbury, N. J. (Ford, Studebaker.)
- Wilson Co., D. B.**—13 Broadway, Waterbury, Conn. (Maxwell.)
- Wilson, A. S.**—1548 Broadway, Denver, Colo. (Earl.)
- Wilson, E. C.**—Richfield, Kan. (Holsman.)
- Wilson's Garage.**—Savannah, Georgia. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Wilson & Ellette Motor Car Co.**—Alliance, Ohio. (Cadillac, Winton.)
- Wilson, Jim P.**—Alpine, Texas. (Waltham.)
- Wilson, Sam J.**—Eau Claire, Wis. (Jackson.)
- Wilson, Thomas H.**—Detroit Club, Detroit, Mich. (Stearns.)
- Wilson, W. Grant.**—2343 Military St., Port Huron, Mich. (Maxwell.)
- Wilson's Garage.**—Wells, Md. (White.)
- Wincapam & Co., C. C.**—Prince's Bay, N. Y. (Waltham.)
- Windiate & Vandenbrooks.**—Craps Bldg., Bay City, Mich. (Maxwell.)
- Wine, E. H.**—Harrisburg, Va. (Rambler.)
- Wing Motor Car Co., F. E.**—12 Columbus Ave., Boston, Mass. (Marmon.)
- Winslow, A. S.**—New Rochelle, N. Y. (Cadillac.)
- Winston, F. G., Jr.**—709 Hennepin Ave., Minneapolis, Minn. (Columbia, Oldsmobile, Waltham, Woods.)
- Winter-Darnell Auto Co.**—3rd & Market Sts., Alton, Ill. (Jackson.)
- Winton Motor Carriage Co.**—1226 Huron Road, Cleveland, O. (Winton.)
- Winton Motor Carriage Co.**—Broadway and 70th St., New York City. (Winton.)
- Winton Motor Carriage Co.**—London, England. (Winton.)
- Winton Motor Carriage Co.**—715 E. Pine St., Seattle, Wash. (White.)
- Winton Motor Carriage Co.**—1259 Michigan Ave., Chicago, Ill. (Winton.)
- Winton Motor Carriage Co.**—Stanhope St., Boston, Mass. (Winton.)

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Winton Motor Carriage Co.**—Pittsburg, Pa. (Winton.)
- Winton Motor Carriage Co.**—San Francisco, Cal. (Winton.)
- Winton Motor Carriage Co.**—248-252 Jefferson Ave., Detroit, Mich. (Winton.)
- Winton Motor Carriage Co.**—246 N. Broad St., Philadelphia, Pa. (Winton); garage; repairing.
- Winton Motor Carriage Co.**—Baltimore, Md. (Winton.)
- Wisconsin Motorcycle Co.**—Monroe, Wis. (Indian.)
- Wiss & Bros., Victor A.**—12 Pine St., Morristown, N. J. (Cadillac.)
- Withee, W. W.**—La Crosse, Wis. (Mitchell.)
- Wittman Co.**—205 S. 11th St., Lincoln, Neb. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Witz, J. L.**—Staunton, Va. (Pope-Hartford.)
- Wolcott, L. A.**—Huntington, W. Va. (Cadillac.)
- Wolf, John.**—Michigan City, Ind. (Winton.)
- Wolf, John F.**—Forge & Willow St., Lebanon, Pa. (Indian.)
- Wolfe, F. D.**—San Jose, Cal. (Jewel.)
- Wolfe, W. H. & L. C.**—1011 Chestnut St., Altoona, Pa. (Thomas, Winton, Studebaker, Pope-Toledo, Autocar, Buick); garage; repairing.
- Wolven, E. J.**—Worthington, Minn. (Rambler.)
- Wolverton, Thos. C.**—537-539 Mercer St., Jersey City, N. J. (Maxwell.)
- Wood & Barnett.**—1333 Broadway, Denver, Colo. (Stoddard-Dayton.)
- Wood Automobile Co., Frank B.**—60-62 River St., Elgin, Ill. (Ford, Rambler, Kisselkar); garage; repairing.
- Woodbury, E. P.**—Burlington, Vt. (Cadillac.)
- Wood, Colbin, C.**—Plymouth, Mass. (Lambert.)
- Woodford, J. M.**—Elkins, W. Va. (Waltham.)
- Wood, J. Elmer.**—Beverly, Mass. (Sterling); garage; repairing.
- Wood, Harry.**—Care Dayton Auto Co., Dayton, O. (Jewel.)
- Wood, John D.**—Geneseo, Ill. (Cameron.)
- Woodmans Sons, C. B.**—Westbrook, Me. (Jewell.)
- Woods Motor Vehicle Co.**—1408 Michigan Ave., Chicago, Ill. (Woods.)
- Woods Motor Vehicle Co.**—245 Eighth Ave., New York City. (Woods.)
- Woods & Co., C. W.**—Timaru, New Zealand. (Monarch.)
- Woods, Wm. F. & Chas. E.**—18 Congress St., Portsmouth, N. H. (Cadillac.)
- Woodward, Reopell Co.**—Springfield, Mass. (Stoddard-Dayton); garage; repairing.
- Woodworth, C. C.**—Aquascalientes, Mexico. (Waltham.)
- Wood, W. W.**—133 Green St., Marietta, Ohio. (Maxwell.)
- Woodyard, C. C.**—Parkersburg, W. Va. (Waltham.)
- Woolman, Maurice.**—Council Bluffs, Ia. (Haynes.)
- Workman, R. A.**—Woodward, Okla. (Waltham.)
- Wortham, W. F.**—Waco, Tex. (Maxwell.)
- Worth & Bowen.**—Rusville, Ind. (National.)
- Worthing Automobile Co., G. W.**—31 W. 29th St., Fond du Lac, Wis. (Pope-Waverley, Jackson.)
- Wright, A. E., Jr.**—Buena Vista, Colo. (Reo, Premier.)
- Wotten, W. O.**—Bank of Cal. Bldg., Tacoma, Wash. (Rambler.)
- Wright, B. A.**—Newport, Ky. (Haynes.)
- Wright, C. H.**—Boulder, Colo. (Holsman.)
- Wright, Frank.**—Appleton, Wis. (Pope-Waverley.)
- Wright Co., H. B.**—Newark, Del. (Rambler.)
- Wright, Northam.**—Chesterbrook, Conn. (Rambler.)
- Wright & West.**—Stockton, Cal. (Maxwell.)
- Writer, Geo. S.**—Nyack, N. Y. (Ford.)
- Wuff's Garage.**—Colusa, Cal. (Ford, Rambler, Maxwell.)
- Wulf, W. J.**—San Juan, Porto Rico. (Thomas Flyer.)
- Wurth, Lewis J.**—26 William St., Morristown, N. J. (Mitchell.)
- Wyckoff, Church & Partridge.**—Broadway & 56th St., New York City. (C. G. V., Stearns); garage; repairing; supplies.
- Wyeth Auto & Supply Co.**—216 N. 2nd St., St. Joseph, Mo. (Buick, Cadillac, Haynes, Stevens-Duryea, Locomobile.)
- Wyoming Valley Motor Car Co.**—35 N. Washington St., Wilkesbarre, Pa. (Buick, Locomobile, Cadillac, Pope-Waverley.)

Y

- Yakima Auto Co.**—Yakima, Wash. (Monarch.)
- Yakima Garage & Auto**
Yakima, Wash. (Cameron)
- Yale, Wm. A.**—Fitchburg, Mass. (Waltham.)
- York Auto Garage.**—SSS, Blk Village, Me. (Reo, Premier.)
- York County Garage.**—Mech Sanford, Me. (Stevens-Duryea, Waverley, Cadillac, Buick); garage; repairing.

AUTOMOBILE AGENTS AND DEALERS (Continued)

- Yost & Oester.**—Illinois St., Mendota, Ill. (Jackson.)
Youmans, John.—251 S. Main St., Waterbury, Conn. (Mitchell, National.)
Young, Geo. H.—814 Hepburn Ave., Williamsport, Pa. (Baker.)
Youngs & Co.—249 Grand St., Newburg, N. Y. (Autocar.)
Youngstown Auto & Repair Co.—Youngstown, Ohio. (Reo, Maxwell.)
Young Thos. G.—707 Pacific Ave., Tacoma, Wash. (Rambler.)
Youse, Ed. S.—46 N. 5th St., Reading, Pa. (Reo, Rambler, Premier); garage; repairing.

Z.

- Zeaman Auto Co., J. A.**—Davenport, Iowa. (Maxwell.)
Zeigler, Roy.—Muncie, Ind. (Haynes.)
Zemliczka & Co.—Misamis, Moscow, Russia. (Winton.)
Zerbel, H. A.—1035 National Ave., Milwaukee, Wis. (Thomas Flyer.)
Zimbrich, A. M.—45-49 South Ave., Rochester, N. Y. (Stoddard-Dayton, Maxwell, Marmon.)
Zim-Kel Motor Car Co.—320 N. Broad St., Philadelphia, Pa. (Pungs-Finch.)
Zimmerman Hardware Co.—Wapakoneta, Ohio. (Richmond.)
Zim-Rock Motor Car Co.—1853 Broadway, near 61st St., New York City. (Deere.)
Zinnel, Frank.—Savana, Ill. (Moline, Oldsmobile.)
Zorn-Strauss Co.—518 Third Ave., Louisville, Ky. (Stevens-Duryea, Franklin.)
Zobell, F. L., Jr.—Church St., Seabright, N. J. (Pope-Waverley, Pope-Hartford, Maxwell.)

AUTOMOBILE MANUFACTURERS—ELECTRIC

- American Electromobile Co.**—Detroit, Mich.
Artignano, G.—Bilbao, Spain.
Babcock Electric Carriage Co.—226 W. Utica, St., Buffalo, N. Y.
Bailey & Co., I—Amesbury, Mass.
Baker Motor Veh—6 Jesse St., Ireland, Ohio.
h Electric Car Co., Ltd.—Oxford St., Camden St., London, England.
ibus Buggy Co.—Columbus, Ohio.
agnie de L'Industrie Electrique et canique.—Geneva, Switzerland.
agnie Française de Voitures Electrobiles.—49-51 rue Cardinet, Paris, France.
agnie Parisiennes des Voitures triques.—45 bvd. Valmy, Paris, France.

AUTOMOBILE MANUFACTURERS—ELECTRIC (Continued)

- Ekstromer Accumulator Co.**—13 Walbrook, London, E. C. England.
Electric Vehicle Co.—Hartford, Conn.
Electric Vehicle Equipment Co.—20th & Montgomery Ave., Philadelphia, Pa.
Electromobile Co., Ltd.—7 Curzon St., Mayfair, London, W., England.
General Vehicle Co.—Borden & Review Aves., Long Island City, N. Y.
Hagen, Gottfried.—Kalk bei Köln, Germany.
Holson Motor Patents Co., Ltd.—Grand Rapids, Mich.
Krieger Automobil Aktiengesellschaft.—131 Wilhelmstrasse, Berlin, Germany.
Lansden Co., The.—54 Lackawanna Ave., Newark, N. J.
Maxim & Goodridge.—550 Prospect Ave., Hartford, Conn.
National Motor Vehicle Co.—2100 E. 22nd St., Indianapolis, Ind.
Officine di Sesto San Giovanni, Camona e Cie.—5 via Spontini, Milan, Italy.
Parsons Electric Motor Carriage Co.—Cleveland, Ohio.
Pope Motor Car Co.—Indianapolis, Ind.
Rauch & Lang Carriage Co., The.—406 Superior St., Cleveland, Ohio.
Scheele, Heinrich.—Lindenthal, Köln, Germany.
Société Anonyme Electromotion.—54 ave Montaigne, Paris, France.
Société Anonyme L'Electrique.—116 rue de Gravel, Levallois-Perret, France.
Societa Italiana Siemens.—337 corso Umberto, Rome, Italy. (Siemens.)
Stoewer, Gebrüder.—Stettin, Germany.
Studebaker Automobile Co.—South Bend, Ind.
Synnestvedt Machine Co.—4117 Liberty Ave., Pittsburg, Pa.
Védrine (Société Anonyme des Voitures Electriques.)—59 boulevard du Château Neuilly, France.
Woods Motor Vehicle Co.—Chicago, Ill.

ELECTRIC—COMMERCIAL

- American Electromobile Co.**—Detroit, Mich.
Auto-Car Equipment Co., Inc.—1453-59 Niagara St., Buffalo, N. Y.
Cantono.—13 viale Paroli, Rome, Italy.
Champion Wagon Co.—Owego, N. Y.
Commercial Truck Co. of America.—Arcade Bldg., Philadelphia, Pa.
Compagnie Parisienne de Voitures Electriques.—bvd. de Valmy, Colombes, France.
Couple-Gear Freight-Wheel Co.—Pythian Temple, Grand Rapids, Mich.
Electric Vehicle Co.—Hartford, Conn.
General Vehicle Co.—Borden & Review Aves., Long Island City, N. Y.
Hagen, Gottfried.—Kalk bei Köln, Germany.

**AUTOMOBILE MANUFACTURERS—
ELECTRIC COMMERCIAL (Cont.)**

Holson Motor Patents Co., Ltd.—Grand Rapids, Mich.
Kruse, Gebrüder.—66 Dorothéenstrasse, Hamburg, Germany.
Lansden Co., The.—Newark, N. J.
McCrea Motor Truck Co., The.—American Trust Bldg., Cleveland, Ohio.
McNaughton Co., James.—29 W. 42nd St., New York City.
Pittsburg Motor Vehicle Co.—Pittsburg, Pa.
Pope Motor Car Co.—Indianapolis, Ind.
Schultze, Paul.—Ogersheim, Germany.
Studebaker Automobile Co.—South Bend, Ind.
Synnestvedt Machine Co.—4117 Liberty Ave., Pittsburg, Pa.

**AUTOMOBILE MANUFACTURERS—
GASOLINE**

Aachener Stahlwarenfabrik Actien Gesellschaft.—Aix-la-Chapelle, Germany.
A. B. C. Motor Vehicle Mfg. Co.—1512 Locust St., St. Louis, Mo.
Abendroth & Root Mfg. Co.—Newburgh, N. Y.
Achenbach und Co.—Hamburg, Germany.
Acme Motor Car Co.—Reading, Pa.
Adami e Co.—10 via Artisti, Florence, Italy.
Adams Co., The.—Dubuque, Iowa.
Adams Manufacturing Co.—147 Queen Victoria Street, London, England.
Ader, Societe des Automobiles.—40ter avenue de Suffren, Paris, France.
Ader, Société des Automobiles.—40ter avenue de Suffren, Paris, France.
Adler Fahrradwerke Vorm. Heinrich Kleyer.—Frankfort am Main, Germany.
Aerocar Motor Co.—Detroit, Mich.
Aigle.—65 rue de Lafayette, Paris, France.
Ajax.—80 Rirschengraben, Zürich, Switzerland.
Albany Automobile Co.—Albany, Ind.
Albion Motor Car Co., Limited.—South Street, Glasgow, Scotland.
Alldays and Onions, Ltd.—Fallows Rd., Birmingham, England.
Allegemeine Berliner Motorwagen Gesellschaft.—21 Lüneburger Strasse, Berlin, Germany.
Alvargonzalez.—Gijon, Spain.
American Auto Vehicle Co.—254 Jefferson Ave., Detroit, Mich.
American Buggy Auto Co.—4309 Olive St., St. Louis, Mo.
American Locomotive Automobile Co.—Providence, R. I.
American Motor Car Co.—Indianapolis, Ind.
Anderson Carriage Co.—Detroit, Mich.
Anglada.—Puerto de Santa Maria, Cadiz, Spain.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Anglian Motor Co.—Beccles, Suffolk, England.
Ansaldo-Cierano.—Daniera Crocetta, Milan, Italy.
Apperson Bros. Automobile Co.—Kokomo, Ind.
Aquila (Fabbrica Italiana di Automobili.)—9 via Bonsignore, Turin, Italy.
Argus Motoren-Gesellschaft.—1 Prinz Louis-Ferdinand Strasse, Berlin, Germany.
Argyll Motors, Ltd.—Glasgow, Scotland.
Ariel Motor Co., Ltd.—133 Long Acre, London, England.
Aries (Société Anonyme des Automobiles.)—39 Quai d'Argenteuil, Ville-neuve-la-Garenne, France.
Armes, Cycles et Automobiles (Société Manufacturière d').—rue Tréfilerie, St. Etienne, France.
Armes de Guerre (Fabrique nationale d').—Herstal-les-Liege, Belgium.
Armstrong, Whitworth and Co., Ltd.—Great Peter St., Westminster, London, England.
Arrol-Johnston Car Co., Ltd., The New.—Underwood, Paisley, Scotland.
Atlas Motor Car Co.—Springfield, Mass.
Atlas (Société des Voitures Automobiles.)—101 rue de la Convention, Paris, France.
Auburn Auto Co.—Auburn, Ind.
Aurora Motor Works.—North Aurora, Ill.
Austin Auto Co.—Grand Rapids, Mich.
Austin Motor Co., Ltd.—Northfield, Birmingham, England.
Austral (Société anonyme de Constructions Mécaniques d').—8 rue du Darcadere, Paris, France.
Auto Buggy Mfg. Co.—4395 Olive St., St. Louis, Mo.
Autocar Co., The.—Ardmore, Pa.
Automobile Parts & Equipment Co.—Chicago, Ill.
Automobiles "Gem."—24 rue de Becon, Courbevoie, Seine, France.
Automobil u. Motorenfabrik vorm. Otto Weisse u. Co.—140 Greifswalderst., Berlin, Germany.
Auto Vehicle Co.—Los Angeles, Cal.
Avon Motor Mfg. Co.—Keynsham, Bristol, England.
Barnes Mfg. Co.—Sandusky, Ohio.
Barré et Cie., C.—avenue de la République, Mort (Deux-Sevres) France.
Barriquand et Marré (Société Anonyme des Ateliers.)—127 rue Oberkan Paris, France.
Bartholomew Co., The.—110 B Ave., Peoria, Ill.
Basset et Méline.—25 rue de Courvallois-Perret, Seine, France.
Bayard-Clément.—33 quai Michelet, vallois-Perret, Seine, France.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Bay State Auto Co.—112 Norway St., Boston, Mass.
Beaulieu u. Krone.—9 Schonebergerstrasse, Berlin, Germany.
Beaufort Motor Co.—14 Baker St., London, England.
Belden Motor Car Co.—720 Bessemer Bldg., Pittsburg, Pa.
Belgica.—rue Van der Straeten, Brussels, Belgium.
Bell Bros.—Ravensthorpe, Yorkshire, England.
Bellefontaine Auto Co.—Bellefontaine, Ohio.
Bel, W. L.—Kansas City, Mo.
Belsize Motors, Ltd.—Clayton, Manchester, England.
Ben Hur Motor Co., The.—120 Randolph St., Chicago, Ill.
Benz u. Cie (Rheinische Gastmotoren Fabrik Actien gesellschaft.)—Mannheim, Germany
Bergmann Industriewerke, G. M. b. H.—Gaggenau, Baden, Germany.
Bérliet Automobiles.—Chemin des Quatre Maisons, Lyon-Montplaisir, France.
Berliner Motorwagenfabrik, G. M. b. H.—Tempelhof, Berlin, Germany.
Bethlehem Automobile Co.—Bethlehem, Pa.
Beverly Mfg. Co.—Beverly, Mass.
Bianchi Co., Ed. e. (Fabbrica d'Automobile e Velocipedi.)—21 via Nino Bixio, Milan, Italy.
Bilgeri-Wuzzer und Co.—Bregens-Laiblack, Borarlberg, Austria.
Black Mfg. Co.—Fort Wayne, Ind.
Blomstrom Mfg. Co., The.—Detroit, Mich.
Blomstrom Motor Co., C. H.—Detroit, Mich.
Bock und Hollender.—72 Hauptstrasse, Vienna, Austria.
Bolide (Société Anonyme des Automobiles.)—5 rue Duranti, Paris, France.
Bolleé, Usines Leon.—Le Mans, France.
Borderel.—135 rue de Clignancourt, Paris, France.
Boyer, Noé.—4 rue de Paris, Puteaux, Seine, France.
Brasier (Société des Automobiles.)—Paris, France.
nia Engineering Co.—Colchester, gland.
-Züst, Fabbrica Automobili.—Bres-Italy.
Co., The.—Payne Ave. and 40th St., veland, Ohio.
te & Co., J. W.—Adrian Works, vestoft, England.
ss Motor Car Co.—508 Howard St., troit, Mich.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Brotherhood-Crocker Motors, Ltd.—19 Hanover Square, London, W., England.
Brouhot, Usines.—Vierzon, Cher, France.
Brown Bros., Ltd.—Deansgate, Manchester, England.
Brush Runabout Co.—Detroit, Mich.
Buckeye Mfg. Co.—Anderson, Ind.
Buick Motor Co.—Flint, Mich.
C. V. I. Motor Co.—Jackson, Mich.
Cadillac Motor Car Co.—Detroit, Mich.
Calthorpe Motor Co., Ltd.—81 John Bright St., Birmingham, England.
Cameron Car Co.—Brockton, Mass.
Cantieri Automobilistici Riuniti.—6 via Luigi Galvani, Palermo, Italy.
Carter Motor Car Corporation.—Munsey Bldg., Washington, D. C.
Chadwick Engineering Works.—Spring Garden & 32nd Sts., Philadelphia, Pa.
Chalfant Motor Car Co.—Lenover, Pa.
Chambers Motors, Ltd.—Cuba St.; works, Belfast, Ireland.
Charron, Ltd.—7 rue Ampere, Puteaux, Seine, France.
Chatham Motor Car Co.—Chatham, Ontario, Canada.
Chénard & Walcker, Société Anonyme des Anciens Établissements.—rue du Moulin de-la-Tour, Gennevilliers, Seine, France.
Chicago Coach & Carriage Co.—Chicago, Ill.
Chicago Recording Scale Co.—Waukegan, Ill.
Civelli de Bosch, Ltd.—Billancourt, Seine, France.
Clement-Talbot, Ltd.—Barlby Road, Kensington, England.
Cleveland Motor Car Co.—1659 Broadway, New York City.
Clèves de et Chevalier.—23 ave du Roule, Neuilly-s-Seine, France.
Colburn Automobile Co.—Denver, Colo.
Columbia Electric Co.—Knightstown, Ind.
Columbus Buggy Co.—Columbus, Ohio.
Commercial Automobile Co.—1353 Garfield Bldg., Chicago, Ill.
Compagnie Belge de Constructions Automobiles, Société Anonyme.—10 rue Ruysdale, Brussels, Belgium.
Compagnie de Constructions Mécaniques, Société Anonyme.—80 rue Jan-Breydel, Bérchem, Anvers, Belgium.
Compagnie de l'Industrie Electrique et Mecanique.—Geneva, Switzerland.
Connersville Motor Vehicle Co.—Connersville, Ind.
Conover Motor Car Co., The.—Pater-son, N. J.
Continental Automobile Co.—New Haven, Conn.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Continental Motor Car Co.—20th St. & West End Ave., Chicago, Ill.
Corbin Motor Vehicle Corporation.—New Britain, Conn.
Cornilleau et Sainte Beuve.—67 bvd Besières, Paris, France.
Cornish-Friedburg Motor Car Co.—Chicago, Ill.
Corré, Compagnie Francaise des Automobiles.—Neuilly-sur-Seine, France.
Cottereau Etablissements.—Lentillières, Dijon, France.
Cottin & Desgouttes.—place du Bachut, Lyon-Montplaisir, France.
Couverchel, V.—55 quai de Boulogne, Boulogne, France.
Covert Motor Vehicle Co.—57 Richmond Ave., Lockport, N. Y.
Crane & Whitman.—Bayonne, N. J.
Crawford Auto Co.—Hagerstown, Md.
Crescent Auto & Supply Co.—2254 Missouri Ave., St. Louis, Mo.
Criterion Motor Co.—Des Moines, Iowa.
Daimler Mfg. Co.—Long Island City, N. Y.
Daimler Motor Co., 1904, Ltd., The.—Daimler Works, Coventry, England.
Daimler Motoren Gesellschaft.—Unterturckheim, Stuttgart, Germany.
Darracq et Cie., A.—33 quai Suresnes, Paris, France.
Dasse, Gérard.—Verviers, Belgium.
Dayton Motor Car Co.—Dayton, Ohio.
Dean & Burden Bros., Ltd.—Salisbury, England.
Deasy Motor Car Manufacturing Co., Ltd., The.—Coventry, England.
Decauville, Société Nouvelle des Etablissements.—Corbeil, Seine-et-Oise, France.
de Dion, Bouton et Cie.—quai National, Puteaux, Seine, France.
de la Buire, Société Anonyme des Automobiles.—place de la Buire, Lyon, France.
Delage et Cie.—102 rue Baudin, Levallois, Paris, France.
Delahaye, Société des Automobiles.—10 rue du Banquier, Paris, France.
De launay-Belleville Etablissements.—St. Denis, Paris, France.
De Luxe Motor Car Co.—Detroit, Mich.
Demeester.—22 ave. de la Grande Armée, Paris, France.
Desmarais & Co.—Prospect St., Bristol, Conn.
Diamond T. Motor Car Co.—Chicago, Ill.
Diatto, A. Clément, Societe Automobili.—Corso Frejus, Turin, Italy.
Dietrich, de, Société Lorraine des Anciens Etablissements.—Lunéville, France.
Dolson Automobile Co.—Charlotte, Mich.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Dorris Motor Car Co.—St. Louis, Mo.
Dragon Motor Co.—30th and Chestnut Sts., Philadelphia, Pa.
Duplex Automobile Works.—4212 State St., Chicago, Ill.
Dragon Automobile Works.—4212 State St., Chicago, Ill.
Dürkopp u. Co.—Bielefeld, Germany.
Durocar Mfg. Co.—1130 S. Main St., Los Angeles, Cal.
Eagle Automobile Co.—Rahway, N. J.
Eagle Motor Car Co.—Middletown, Conn.
Earl Motor Car Co.—Kenosha, Wis.
Easton Machine Co.—South Easton, Mass.
Edge, Selwyn F., Ltd.—14 New Burlington St., London, W., England.
E. G. A., Entrepot General d'Automobiles.—209 bvd. Pereire, Paris, France.
Egg & Co., R.—46 rue de Lyon, Paris, France.
Ehrhardt, Henrich.—Düsseldorf, Germany.
Electric Vehicle Co., The.—Hartford, Conn.
Elmore Mfg. Co.—Clyde, Ohio.
Enfield Autocar Co.—Redditch, England.
Español-Suiza, Sociedad Anonima.—54 calle Floridablanca, Barcelona, Spain.
Eudelin, M.—Joinville le-pont, Paris, France.
Euston Motor Co., Ltd.—124 Euston Rd., London, England.
Evansville Automobile Co.—Evansville, Ind.
Express Fahrradwerke Actien Gesellschaft.—Nürnberg, Germany.
Eysink, D. H.—Amersfoort, Holland.
Fabbrica Automobili Standard.—20 corso Siccardi, Turin, Italy.
Fabbrica di Automobili Florentia.—15 Viale in Curva, Florence, Italy.
Fabbrica Italiana Automobili di Torino.—35 corso Dante, Turin, Italy.
Fabbrica Ligure di Automobili di Genova.—2 piazza Corvetto, Genoa, Italy.
Fabrique Nationale d'Armes de Guerre.—Herstal-lez-Liege, Belgium.
Fahrzeugfabrik Eisenach.—Eisenach, Germany.
Fischerre et C rtin.—Spitzkehrer, Zürich, Switz.
Fish Automobile Co.—Detroit, Mich.
Ford Motor Co.—Detroit, Mich.
Forest Automobile Co.—St. L.
Forest City Motor Ohio.
Fort Pitt Motor sington, Pa.
Foullaron, G.—54 rue vallois-Perret, Seine, France
Franklin Mfg. Co., H. H.—N. Y.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Maplebay Mfg. Co.—Crookston, Minn.
Marion Motor Car Co.—W. 15th St. & Big Four R. R., Indianapolis, Ind.
Martin et Lethimonnier.—32 rue Félicien-David, Paris-Auteil, France.
Martini Automobile Company, Ltd.—St. Blaise and Frauenfeld, Switzerland.
Maschinen und Wagenbaufabriks Actien Gesellschaft.—Semmering, Austria.
Mason Motor Car Co.—E. 5th & Vine Sts., Des Moines, Iowa.
Matheson Motor Car Co.—Wilkesbarre, Pa.
Mathis und Co., E. E. C.—25 Finksmattstrasse, Strasbourg, Germany.
Matthews Motor Co.—Camden, N. J.
Maxwell-Briscoe Motor Co.—Tarrytown, N. Y.; Newcastle, Ind.
Med-Bow Auto Co.—Springfield, Mass.
Mendelssohn et Co., Ltd., E.—Courbevoie, Seine, France.
Menges Motor Car Co.—Grand Rapids, Mich.
Métallurgique, Société Anonyme La.—1 place de Louvain, Brussels, Belgium.
Meteor Automobile Works, The.—Be-tendorf, Iowa.
Michigan Automobile Co.—Kalamazoo, Mich.
Mieusset fils, V.—17 rue du Gazometre, Lyon, France.
Minerva Motors, Ltd.—Bérchem, An-vers, Belgium.
Mitchell Motor Car Co.—Racine Junction, Wis.
Model Automobile Co.—Peru, Ind.
Modern Tool Co.—Erie, Pa.
Moline Auto Co.—East Moline, Ill.
Moline Pump Co.—Moline, Ill.
Monarch Motor Co.—Chicago Heights, Ill.
Moon Motor Car Co.—Main and Cor-nelia Sts., St. Louis, Mo.
Moore Auto Co.—571 5th Ave., New York City.
Mora Motor Car Co.—Newark, N. Y.
Mors, Société Anonyme d'Automobiles.—48 rue du Théâtre, Paris, France.
Motorbloc, Société Anonyme des Auto-mobiles.—102 rue des Vivants, Bor-deaux, France.
Motorcar Co., The.—Detroit, Mich.
Motorenfabrik Protos.—3 Grosser Gör-schenstrasse, Berlin, Germany.
Motorfahrzeugfabrik Köln Gesellschaft.—20 Marsiliusstrasse, Koln, Germany.
Motorwagenfabrik Excelsior Actien Ges-ellschaft.—Zürich-Wollishofen, Switz-erland.
Nacke, E.—Koetitz bei Coswig, Saxony, Germany.
Nagant frères.—44 quai de Coronmeuse, Liège, Belgium.
Napier Motor Car Co. of America.—Jamaica Plain, Mass.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Napier Motor Co.—Acton Vale, London, England.
National Motor Vehicle Co.—Indianap-olis, Ind.
Neilsen Motor Car Co.—Detroit, Mich.
Nesseldorfer Wagenbaufabriks Gesell-schaft.—Messeldorf, Moravia, Austria.
Neue Automobil Gesellschaft.—31 Luis-enstrasse, Berlin, Germany.
New Engine Co.—Acton Vale, London, W., England.
New England Automobile Mfg. Co.—27 State St., Boston, Mass.
New Leader Motors, Ltd.—Aspley, Not-tingham, England.
New Orleans Motor Co., Ltd.—Twicken-ham, England.
New York Car & Truck Co.—Kingston, N. Y.
Nordyke & Marmon Co.—Indianapolis, Ind.
Northern Motor Car Co.—Detroit, Mich.
Oakland Motor Car Co.—Pontaic, Mich.
Oesterreicher Daimler Motoren Gesell-schaft.—Wiener, Neustadt, Austria.
Officina Archimede.—57 via Flamina, Rome, Italy. (Archimede.)
Okey Motor Car Co.—Columbus, Ohio.
Olds Motor Works.—Lansing, Mich.
Opel, Adam.—Russelsheim am Main, Germany.
Overland Automobile Co.—Standard Ave. & Division St., Indianapolis, Ind.
Packard Motor Car Co.—Detroit, Mich.
Page Gas Engine Co.—Adrian, Mich.
Panhard et Levassor, Société Anonyme des Anciens Etablissements.—19 ave. d'Ivry, Paris, France.
Peerless Motor Car Co., The.—Lisbon St., Cleveland, Ohio.
Pennsylvania Auto Motor Co.—Bryn Mawr, Pa.
Perfection Automobile Co.—South Bend, Ind.
Peugeot frères, Société Anonyme des Peugeot freres, Societe Anonyme des Automobiles.—Audincourt, Seine, France.
Pfalzische Naehmaschinen & Fahr-raeder Fabrik.—Kaiserlautern, Germany.
Phoenix Motors, Ltd.—Blundell St. Cale-donian Road, London, W., England.
Picker, Moccand et Cie, L., Société Ano-nyme des Anciens Etablissemen—78 Chene-Bougeues, Geneva, Swi land.
Piedboeuf, Ateliers A. G.—63 ru Fragnee, Liege, Belgium.
Pierce Engine Co.—Racine J1 Wis.
Pierce Co., The George N.—169, 1 wood Ave., Buffalo, N. Y.
Pilain, Société des Automobiles.—chemin Grange-rouge, Lyon, France

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Pontiac Motor Vehicle Co.—Pontiac, Mich.
Pope Mfg. Co.—Hartford, Conn.
Pope Motor Car Co.—Toledo, Ohio.
Porthos, Société Générale des Automobiles.—12 rue du Dôme, Billancourt, Seine, France.
Postal Auto & Engine Co.—Bedford, Ind.
Premier Motor Mfg Co.—Indianapolis, Ind.
Prunel freres, Dumas et Co.—10 rue de Paris, Puteaux, Paris, France.
Pullman Motor Car Co.—Chicago, Ill.
Pungs-Finch Auto & Gas Engine Co.—Detroit, Mich.
Radia.—12 rue Barbés, Levallois, Paris, France.
Rainier Co., The.—Saginaw, Mich.
Rapid, Societa Torinese Automobili.—Barriere di Nizza, Turin, Italy.
Reliable-Dayton Motor Car Co.—375 W. Lake St., Chicago, Ill.
Reliance Motor Car Co.—Detroit, Mich.
Rénault frères.—139 rue du Point-du-jour, Billancourt, Seine, France.
Reo Motor Car Co.—Lansing, Mich.
Richard, Georges, Société des Automobiles.—1 quai National, Puteaux, Paris, France.
Riley Cycle Co., The.—Coventry, England.
Rochet et Schneider, Ltd.—57 chemin Feuillat, Lyon, France.
Rockford Automobile & Engine Co.—Rockford, Ill.
Rolls-Royce, Ltd.—14 Conduit St., London, W., England.
Rossel et Cie.—Sochaux, pres Montbéliard, Doubs, France.
Rover Co., Ltd., The.—Coventry, England.
Royal Motor Car Co.—Cleveland, Ohio.
Roydale Engineering Co.—Trafalgar Works, Huddersfield, England.
Ruppe und Sohn, A.—Apolda, Germany.
Sabella Motor Car Co.—Camden Town, N. W., England.
Sampson, Alden Co.—Pittsfield, Mass.
San Giorgio, Societe Italiana per Costruzioni di Automobili.—Sestri Ponente, Italy.
Schacht Mfg. Co., The.—2727 Spring Grove Ave., Cincinnati, Ohio.
—a Motor Vehicle Co.—701 German Insurance Bldg., Rochester, N. Y.
—mut Motor Co.—Stoneham, Mass.
—utomobile Co.—Elkhart, Ind.
—a Automobile Co.—83rd St. & 4th River, New York City.
—ex Motor Car Co.—Mishawaka, Ind.
—h Auto Co.—Topeka, Kan.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Sinclair Scott Company, The.—Baltimore, Md.
Singer Motor Co., Ltd.—Coventry, England.
Sizaire et Naudin, Société des Automobiles.—79 rue de Lourme, Paris, France.
Societa Cierano Automobili Torino.—66 via Madama Christina, Turin, Italy.
Societa Fides.—Rome, Italy.
Societa Italo-Svizzera di Costruccioni Meccaniche.—Bologna, Italy.
Societa Milanese Industria Meccaniche.—San Cristoforo, Milan, Italy.
Société Anonyme des Automobiles Ruhl.—Dison-Verviers, Belgium.
Société de Construction Automobile de Reims.—Witry-lez-Reims, France.
Société Neufchateloise d'Automobiles.—Boudry, prés Neufchatel, Switzerland. (F. Henriod-Cchweitzer.)
Soedertelge-Werkstaeder.—Soedertelge, Sweden.
Sommer Motor Co.—152 Congress St., E. Detroit, Mich.
Spyker, Usines.—Trompenburg, Amsterdam, Holland.
Stanley Auto & Mfg. Co.—Moreland, Ind.
Star Engineering Co.—Wolverhampton, England.
Staver Carriage Co., The.—76th & Wallace Sts., Chicago, Ill.
Stearns Co., The F. B.—Cleveland, Ohio.
Steel Swallow Co., The.—Jackson, Mich.
Steinhart-Jensen Automobile Co.—Masonic Bldg., Joliet, Ill.
St. Louis Car Co.—St. Louis, Mo.
Sterling Engine Co.—119 Grant St., Buffalo, N. Y.
Stevens-Duryea Co.—Chicopee Falls, Mass.
Stilson Motor Car Co.—Pittsfield, Mass.
Stöwer, Gebrüder.—Stettin, Germany. (Stower.)
Straker-Squire, Ltd.—75 Shaftesbury Ave., London, W., England.
Streator Motor Car Co.—Streator, Ill.
Studebaker Automobile Co.—South Bend, Ind.
Sturmey Motors, Ltd.—231 Widdington Road, Coventry, England.
Sturtevant Mill Co., The.—Harrison Sq., Boston, Mass.
Success Auto-Buggy Mfg. Co.—528 De Balliviere Ave., St. Louis, Mo.
Sultan Motor Co.—Springfield, Mass.
Sunbeam Motor Car Co., Ltd.—Upper Villiers St., Wolverhampton, England.
Sunset Automobile Co.—San Francisco, Cal.
Swift Motor Co., Ltd.—Coventry, England.
Swronsky.—Litzeiskara, St. Petersburg, Russia.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Thomas Detroit Co., E. R.—Detroit, Mich.
Thomas Motor Co., E. R.—Buffalo, N. Y.
Thornycroft & Co., Ltd., John I.—Homefield, Chiswick, London, England.
Tincher Motor Car Co.—South Bend, Ind.
Trebert Gas Engine Co.—Rochester, N. Y.
Twryford Motor Car Co.—Brookville, Pa.
Usines et Fonderies de Baume et Mercant.—Haine-Saint-Pierre, Belgium.
Utermöhle Gesellschaft, J. W.—Köln, Germany.
Vandegrift Automobile Co.—13th & Cumberland Sts., Philadelphia, Pa.
Vauxhall Motors, Ltd.—Luton, England.
Victor Automobile Mfg. Co.—171 Carroll St., St. Louis, Mo.
Victory Motor Car Co.—San Jose, Cal.
Vinot et Dequingand.—29 quai National, Puteaux, Seine, France.
Vivinus, Société Anonyme des Ateliers.—54 rue Destouvelles, Brussels, Belgium.
Vrard et Cie.—12 bvd. d'Asnieres, Neuilly-sur-Seine, France.
Vulcan Schweiz-Automobil und Motorbootfabrik Actien Gesellschaft.—Alstetten-Zürich, Switzerland.
Vulpea, Société Anonyme des Automobiles.—170 bvd. National, Clichy, Seine, France.
Wait & Co., G. H.—Humberston Gate, Leicester, England.
Walter Auto Co., The.—Trenton, N. J.
Waltham Mfg. Co.—Waltham, Mass.
Washington Motor Car Co.—Washington, Ind.
Waukeshaw Motor Co.—Waukeshaw, Wis.
Wayne Automobile Co.—Detroit, Mich.
Weidmann und Co.—93 Brunaustrasse, Zürich, Switzerland.
Weigel Motors (1907), Ltd.—90 Goswell Road, London, E. C., England.
Western Auto Parts Co.—107 Dearborn St., Chicago, Ill.
Welch Motor Car Co.—Pontiac, Mich.
Western Engine Co., The.—Chicago, Ill.
Western Tools Works.—Galesburg, Ill.
Westfälische Automobil Gesellschaft.—Soest-i-Westphalia, Germany.
West, Ltd.—85 Shaftesbury Ave., London, W., England.
Wilcox Motor Car Co., H. E.—Tith Ave., & Marshall St., N. E., Minneapolis, Minn.
Winton Motor Carriage Co., The.—Cleveland, Ohio.
Withers & Co., Ltd.—35 Edgware Road, London, W., England.

**AUTOMOBILE MANUFACTURERS—
GASOLINE (Continued)**

Wolseley Tool & Motorcar Co.—Adderley Park, Birmingham, England.
Wolsit, Fabbrica di Automobili.—Turin, Italy.
Woods Motor Vehicle Co.—Chicago, Ill.
York Motor Car Co.—York, Pa.
Zena, Societa Anonima di Automobili.—via XX Settembre, Genoa, Italy.
Züst, Roberto.—Milan, Italy.

**AUTOMOBILE MANUFACTURERS—
GASOLINE—COMMERCIAL**

Acme Motor Car Co.—Reading, Pa.
Ader, Ltd., Société des Anciens Établissements.—40ter ave de Suffren, Paris, France.
American Foundry Co.—Leipsic, Ohio.
American Machine Mfg. Co.—133-137 Beaubien St., Detroit, Mich.
American Motor Truck Co.—Lockport, N. Y.
Arbenz und Co., Eugene.—17 Wolfbach Strasse, Zürich, Switzerland.
Auto-Car Equipment Co.—77-79 Edward St., Buffalo, N. Y.
Automobiles Ariés, Société Anonyme.—104 rue Richelieu, Paris, France.
Automobile Eugene Brillié.—60 bvd. Péreire, Paris, France.
Automobiles Industriels, Société Generale des.—3 rue Vignon, Paris, France.
Beaufort Motor Co.—14 Baker St., London, W., England.
Benz und Co., Rheinische Gasmotoren-Fabrik Actiengesellschaft.—Mannheim, Germany.
Brouhot, Usines.—Vierzon, Cher, France.
Brush Electric Engineering Co.—Victoria Works, Belvedere Road, Lambeth, London, England.
Buckeye Mfg. Co.—Anderson, Ind.
Buffalo Auto-Truck & Motor Co.—35 Mississippi St., Buffalo, N. Y.
Bussing, H.—Elmstrasse, Braunschweig, Germany.
Cadillac Motor Car Co.—Detroit, Mich.
Cadogan Motor Co.—102 Sydney St., Chelsea, London, England.
Campagne, E.—45 bvd. de Belleville, Paris, France.
Chaboche, E.—33 rue Rodier, Paris, France.
Chase Motor Truck Co.—232 E. Water St., Syracuse, N. Y.
Chénard et Walcker, Société Anonyme des Anciens Établissements.—rue de Moulin-de-la-Tour, Gennevilliers, France.
Chicago Commercial Auto Mfg. Co.—Chicago, Ill.
Christiansen & Co., H. C.—53 St. Kongensgade, Copenhagen, Denmark.
Cockerill, Société Anonyme, John.—Seraing, Belgium.

**AUTOMOBILE MANUFACTURERS—
GASOLINE COMMERCIAL (Cont.)**

Cohendet et Cie., A.—166 quai Jemappes, Paris, France.
Commercial Motor Co.—Marion, N. J.
Commercial Motor Truck Co.—Plymouth, Ohio.
Compagnie Belge de Construction d'Automobiles.—10 rue Ruysdal, Brussels, Belgium.
Consolidated Motor Co.—148 W. 56th St., New York.
Coppock Motor Co.—Decatur, Ind.
Corbin Motor Vehicle Corporation.—New Britain, Conn.
Corré, Compagnie Française des Automobiles.—37 rue de Villiers, Neuilly-sur-Seine, France.
Cottureau, Établissements.—Lentillieres, Dijon, France.
Covert Motor Vehicle Co.—Lockport, N. Y.
Cudell und Cie.—Reinikens dorferstrasse 65, Berlin, Germany.
Daimler Mfg. Co.—959 Steinway Ave., Long Island City, N. Y.
Daimler Motor Co., Ltd., The.—Coventry, England.
Daimler Motoren Gesellschaft.—Unterturckheim, Germany.
Décauvillaine, Société Nouvelle des Établissements.—Petit-Bourg, Seine-et-Oise, France.
de Dion, Bouton et Cie.—quai National, Puteaux, Seine, France.
Delahaye et Cie.—10 rue du Banquier, Paris, France.
D'Espine, Achard et Cie.—52 quai de la Marne, Paris, France.
Dietrich, Société Lorraine des Anciens Établissements de.—Luneville, France.
Dufour, Société Anonyme des Camions et Moteurs.—19 rue de la République, Marseille, France.
Dürkopp und Co., Actien Gesellschaft.—Bielefeld, Germany.
Ehrhardt, Heinrich.—Düsseldorf, Germany. (Ehrhardt.)
Empire State Engineering Works.—555 E. 116th St., New York City.
Fabbrica di Automobili Florentia, Società Anonima.—Florence, Italy.
Fabbrica Italiana di Automobili di Torino.—35 corso Dante, Turin, Italy.
Fabbrica Italiana di Automobili di Genova, Società Anonima.—Genoa, Italy.
Eisenack, Auto Co.—Mankato, Minn.
Emery, The.—Detroit, Mich.
Automobile Co., Inc., The.—Cleveland, Ohio.
Ernest, Société Anonyme Ateliers.—Lillo, Brussels, Belgium.
J-Pettit Mfg. Co.—1217 Devon St., Chicago, Ill.

**AUTOMOBILE MANUFACTURERS—
GASOLINE COMMERCIAL (Cont.)**

Gillet-Forest, Société de Construction et d'Exploitation des Automobiles.—23 quai de President Carnot, Saint Cloud, France. (Gillet-Forest.)
Guilliérme, F.—17 rue de Billancourt, Paris, France.
Hambrick Motor Car Co.—Washington, Ind.
Heine Velox Motor Car Co.—San Francisco, Cal.
Helios Electricitats Actien Gesellschaft.—Köln-Ehrenfeld, Germany.
Hewitt Motor Co.—10 E. 31st St., New York City.
Hinde & Dauch.—Sandusky, Ohio.
Ideal Mfg. Co.—Portsmouth, Ohio.
Jeffery & Co., Thos. B.—Kenosha, Wis.
Kansas City Motor Car Co.—Sheffield, Mo.
Karback Automobile & Vehicle Co.—Omaha, Neb.
Knox Automobile Co.—Springfield, Mass.
Knox Motor Truck Co.—Birnie Ave., Springfield, Mass.
Lacoste & Battmann.—15 rue Danton, Luneville, Paris, France.
La Locomotrice, Société Anonyme.—35 rue de Vennes, Liège, Belgium.
Latil, Société, Française de Mécanique et d'Autos.—Colombes and St. Ouen, France.
Lear Automobile Co., Oscar.—Springfield, Ohio.
Logan Construction Co.—Chillicothe, O.
Mack Bros. Motor Car Co.—Allentown, Pa.
Marion Motor Car Co.—Indianapolis, Ind.
Martini Co., Ltd.—St. Blaise, Switzerland.
Maxwell-Briscoe Motor Co.—Tarrytown, N. Y.; Newcastle, Ind.
McNaughton Co., Jas.—29 W. 42nd St., New York City.
Meiselbach Motor Wagon Co.—North Milwaukee, Wis.
Mercantile Motor Co.—Jersey City, N. J.
Miller Motor Car Co., Inc.—Bridgeport, Conn.
Milnes-Daimler Co., Ltd.—221 Tottenham Court, London, W., England.
Mitchell Motor Car Co.—Racine, Wis.
Model Automobile Co.—Peru, Ind.
Monarch Motor Car Co.—Chicago Hgts., Ill.
Motorcar Co.—Detroit, Mich.
Nacke, E.—Coswig, Saksen, Germany.
Nagant freres.—44 quai de Coronmeuse, Liège, Belgium.
Neilsen Motor Car Co.—Detroit, Mich.
Nesseldorfer Wagenbau Fabriks Gesellschaft.—Semmering, Vienna, Austria.
Neue Automobil Gesellschaft.—Berlin, Germany.

**AUTOMOBILE MANUFACTURERS—
GASOLINE COMMERCIAL (Cont.)**

Northern Motor Car Co.—Detroit, Mich.
Olds Motor Works.—Lansing, Mich.
Packard Motor Car Co.—Detroit, Mich.
Panhard et Levassor, Société Anonyme des Anciens Établissements.—19 ave d'Ivry, Paris, France.
Pantz, Ch.—Pont-a Mousson, France.
Peugeot, Société Anonyme des Automobiles.—83 bvd. Gouvion, St. Cyr, Paris, France.
Pontiac Motor Car Co.—Pontiac, Mich.
Pope Manufacturing Co.—Hartford, Conn.
Pope Motor Car Co.—Toledo, Ohio.
Premier Motor Mfg. Co.—Indianapolis, Ind.
Prunel frères, Dumas et Cie.—10 rue de Paris, Puteaux, France.
Rapid Motor Vehicle Co.—Pontiac, Mich.
Rapid, Societa Torinese Automobili.—Barriera di Nazza, Turin, Italy.
Rébour, J.—3 rue Ampere, Puteaux, France.
Reliance Motor Car Co.—67 E. Fort St., Detroit, Mich.
Renard, Société Française des Trains.—11 rue Lafayette, Paris, France.
Rénault frères.—139 rue Point-du-jour, Billancourt, Paris, France.
Reo Motor Car Co.—Lansing, Mich.
Saurer, Adolph.—Arbon, Switzerland.
Sayers & Scovill.—2247-2261 Colerain Ave., Cincinnati, Ohio.
Sheffield Car Co.—Three Rivers, Mich.
Shop of Siebert, The.—Toledo, Ohio.
Siegel, Feodor.—Schoenebeck am Elbe, Germany.
Simpson, Wm. G.—80 Broadway, Detroit, Mich.
Single Center Buggy Co.—Evansville, Ind.
Societa Italiana Roma.—Rome, Italy.
Société Anonyme de Marcinelle et Couillet.—Couillet, Belgium.
Stevens-Duryea Co.—Chicopee Falls, Mass.
Stoewer, Gebrüder.—Stettin, Germany.
Straker & Squire.—9 Bush Lane, London, E. C., England. (Straker-Squire.)
Süddeutsche Automobilfabrik Gaggenau.—Gaggenau, Germany.
Thomas Wagon Co., The.—Vernon, N. J.
Torbensen Motor Car Co.—Bloomfield, N. J.
Troutt-Yokom Car Co.—Port Huron, Mich.
Turgan, Ltd., Établissements.—96 rue Antonin-Raynand, Levallois, France.
Usines de Puteaux, Société Anonyme.—4 rue de Paris, Puteaux, Seine, France.
Viking Co., The.—801 Boylston St., Boston, Mass.
Waltham Mfg. Co.—Waltham, Mass.

**AUTOMOBILE MANUFACTURERS—
GASOLINE COMMERCIAL (Cont.)**

Weber Landolt.—Menziken, Argovia, Switzerland.
Western Tool Works.—Galesburg, Ill.
Westinghouse, Société Anonyme.—Havre, France.
Whiting Motor Car Co.—Jackson, Mich.
Whitman Agricultural Co.—St. Louis, Mo.
Worth Motor Car Mfg. Co.—219 Upper First St., Evansville, Ind.

**AUTOMOBILE MANUFACTURERS—
GASOLINE-ELECTRIC**

Auto-Mixte, Société L'.—93 rue Haye-neux, Herstal-lez-Liège, Belgium.
Electric Vehicle Co.—Hartford, Conn.

**AUTOMOBILE MANUFACTURERS—
STEAM**

Auto-Vapeur, Société L'.—116 bvd Pereire, Paris, France.
Belknap Motor Car Co.—Detroit, Mich.
Blairlight Co.—Northboro, Mass.
Boss Knitting Machine Works.—Reading, Pa.
Chaboche, E.—33 rue Rodier, Paris, France.
Cremorne Motor Mfg. Co.—Lotts Road, Chelsea, London, S. W., England.
Darracq-Serpollet et Cie.—Suresnes, France.
Essex Motor Car Co.—60 State St., Boston, Mass.
Halsey, James T.—336 W. York Ave., Philadelphia, Pa.
Johnson Service Co.—149-153 Michigan St., Milwaukee, Wis.
Kraftzeug-Werke Gesellschaft.—Brandenburg, Germany.
Lane Motor Vehicle Co.—Poughkeepsie, N. Y.
Liquid Fuel Engineering Co.—Cowes, Isle of Wight, England.
Newcomb Motor Co.—378 Jackson Ave., Long Island City, N. Y.
Pittsburg Machine Tool Co.—Allegheny, Pa.
Ross, Louis S.—Newtonville, Mass.
Stanley Motor Carriage Co.—Newton, Mass.
Terwilliger & Co., Wm. B.—32 D St., Amsterdam, N. Y.
Turner's Motor Mfg. Co.—Watson, England.
Twombly Motor Carriage—way, New York.
Weyher et Richmond, Société An des Établissements.—52 route d'Avilliers, Pantin, France.
White Co., The.—Rose Bldg., Cleveland, Ohio.

AUTOMOBILE MANUFACTURERS— STEAM COMMERCIAL

American-Coulthard Co.—Peabody, Mass.
Aveling & Porter.—Rochester, England.
Bristol Wagon & Carriage Works.—Bristol, England.
Buffaud, Robatel et Cie.—59 chemin de Baraban, Lyon, France.
Clarkson, Ltd.—Moulsham Works, Chelmsford, England.
Columbia Engineering Works.—William & Emlay Sts., Brooklyn, N. Y.
Commercial Truck and Power Co.—171 Main St., Rahway, N. J.
Coulthard & Co.—Preston, England.
Darracq-Serpollet et Cie.—Suresnes, France.
de Dion, Bouton et Cie.—quai National, Puteaux, Seine, France.
Ellis & Co., Jesse.—Maidstone, Kent, England.
Fowler & Co., John.—Magdeburg, Germany.
Fried Krupp Aktien Gesellschaft Germania Werft.—Kiel, Germany.
Hannoverische Maschinenbau Actien Gesellschaft.—Linden, Germany.
Johnson Service Co.—149-153 Michigan St., Milwaukee, Wis.
Komarek.—55 Quellengasse, Vienna, Austria.
Kruse, Gebrüder.—66 Dorothéenstrasse, Hamburg, Germany.
Lancashire Steam Motor Co.—Leyland, England.
Liquid Fuel Engineering Co.—Cowes, Isle of Wight, England.
Magnard et Cie.—Fourchambault, Nièvre, France.
Musker, C. & A.—Tunbrook, Liverpool, England.
Newcombe Motor Co.—378 Jackson Ave., Long Island City, N. Y.
Pittsburg Machine & Tool Co.—Larcok & Darrach Sts., Allegheny, Pa.
Purrey, V.—1-31 bvd. J-J Bosc, Bordeaux, France.
Robertson & Son, J.—Fleetwood, England.
Scotte, Société des Chaudières et Voitures a' Vapeur.—56 rue de Provence, Paris, France.
Societa Anonima di Automobili Serpollet.—Milan, Italy.
Weymancroft Steam Wagon Co.—Homed, Chiswick, London, England.
Motor Co.—The.—3rd & Trumbull St., Elizabethport, N. J.
in, Ltd.—Etablissements.—96 rue Bonin-Raymond, Levallois, France.
e Co., The.—Rose Bldg., Cleveland,

AXLES

ican Ball Bearing Co.—Edgewater
rk & L. S. & M. S. Ry., Cleveland,
 io.

AXLES (Continued)

American Roller Bearing Co.—Tripp St., South Framingham, Mass.
Bates Forge Co.—227 Merrill St., Indianapolis, Ind.
Borbein Auto Co.—2109 N. 9th St., St. Louis, Mo.
Cambria Forge Co.—Cleveland, Ohio, and Johnstown, Pa.
City Machine Co.—9-13 Orchard St., Detroit, Mich.
Columbus Screw & Machine Co.—Columbus, Ohio.
Covert Motor Vehicle Co.—57-61 Richmond Ave., Lockport, N. Y.
Cramp & Sons Ship & Engine Building Co.—Philadelphia, Pa.
Dalzell Axle Co.—South Egremont, Mass.
Deschler, August.—18-20 E. Water St., Chillicothe, Ohio.
Detroit Seamless Steel Tube Co.—833 River St., Detroit, Mich.
Direct Drive Axle Co.—575 N. 4th St., Columbus, Ohio.
Funk Engineering Co.—39-45 14th St., Hoboken, N. J.
Garford Co., The.—Elyria, Ohio.
Gill & Sons Forge & Machine Works, P. H.—Brooklyn, N. Y.
Hayden Co., N. L.—Columbus, Ohio.
Judd & Leland Mfg. Co.—Hibbard Ave., Clifton Springs, N. Y.
Lee & Porter Mfg. Co.—Buchanan, Mich.
Long Arm System Co.—Lakeside Ave. & E. 38th St., Cleveland, Ohio.
Merchant & Evans Co.—517 Arch St., Philadelphia, Pa.
Neustadt Auto & Supply Co.—3948-50 Olive St., St. Louis, Mo.
Northway Motor & Mfg. Co.—Grand Ave., Detroit, Mich.
Rockford Automobile & Engine Co.—Rockford, Ill.
Salisbury Wheel & Mfg. Co.—Jamestown, N. Y.
Shelby Steel Tube Co.—Pittsburg, Pa.
Sheldon Axle Co.—Wilkesbarre, Pa.
Smith Co., A. O.—Park & Clinton Sts., Milwaukee, Wis.
Standard Ball Axle Co.—Lancaster, Pa.
Standard Roller Bearing Co.—48th St. & Girard Ave., Philadelphia, Pa.
Timken Roller Bearing Axle Co.—Canton, Ohio.
Tindel-Morris Co.—Eddystone, Pa.
Webster Mfg. Co.—1075 W. 15th St., Chicago, Ill.
Weston-Mott Co.—Flint, Mich.

BAGS—TOOL

Boyle & Co., John.—112-114 Duane St., New York City.
Gilbert Mfg. Co., The.—New Haven, Conn.

BAGS—TOOL (Continued)

- Mason, John A.**—1312 Washington St., Newton, Mass.
Nathan Novelty Mfg. Co.—88 Reade St., New York City.
Republic Belting & Supply Co.—1616 W. 3rd St., Cleveland, Ohio.
Vehicle Apron & Hood Co.—Columbus, Ohio.
Warner Pole & Top Co.—1655 Central Ave., Cincinnati, Ohio.
Winship, W. W.—71 Summer St., and 11 Kingston St., Boston, Mass.

BALL RETAINERS, see CONES

BALLS—BRASS

- American Ball Co.**—Cor. Kinsley Ave. & Eagle St., Providence, R. I.
Jones & Co., E. J.—Arlington Heights, Mass.

BALLS—STEEL

- American Ball Co.**—Cor. Kinsley Ave. & Eagle St., Providence, R. I.
Buffalo Excelsior Machinery Co.—Military Road, Buffalo, N. Y.
Leng's Sons & Co., John S.—33 Murray St., New York City.
Pressed Steel Mfg. Co.—454 The Bourse, Philadelphia, Pa.
Standard Roller Bearing Co.—48th St. & Girard Ave., Philadelphia, Pa.

BANDS—BRAKE

- Boston Pressed Metal Co.**—171-173 Union St., Worcester, Mass.
Caldwell Co.—136 S. 14th St., Philadelphia, Pa.
Cramp & Sons Ship & Engine Building Co.—Philadelphia, Pa.
Republic Belting & Supply Co.—1616 W. 3rd St., Cleveland, Ohio.
Rosendale-Reddaway Belting & Hose Co.—Newark, N. J.
United States Bronze Co.—149 Columbus St., Cleveland, Ohio.

BASKETS, AUTO—METAL AND WICKER

- A. Z. Co., The.**—527 W. 56th St., New York City.
Atlas Mfg. Co.—Hampton, N. H.
Bailie Basket Co.—82 Sudbury St., Boston, Mass.
Boston Mat & Basket Co.—62 Fulton St., Boston, Mass.
Burlington Basket Co.—Burlington, Ia.
Heywood Bros. & Wakefield Co.—174 Portland St., Boston, Mass.
M. & A. Basket Co.—259 E. 27th St., New York City.
Rattan Mfg. Co.—522 State St., New Haven, Conn.
Rumpp & Sons, C. F.—Philadelphia, Pa.
Scherer, Williams Co.—30 Lewis Wharf, Boston, Mass.

BATTERIES—PRIMARY

- Alpha Dry Battery Co.**—28 Cortlandt St., New York City.
American Electrical Novelty & Mfg. Co.—308 Hudson St., New York City.
Ampere Mfg. Co.—408-412 W. 13th St., New York City.
Auto Specialty Co.—60 E. Madison St., Chicago, Ill.
Badiola, M.—Puerto de Santa Maria, Cadiz, Spain.
Bara, Pascual et Riga.—35 rue Victor-Massé, Paris, France.
Central Electric Mfg. Co.—1525 Second Ave., Rock Island, Ill.
Columbus Electricitäts Gesellschaft.—Ludwigshafen-am-Rhein, Germany.
Compound, Allumage Électrique.—135 ave. de Villiers, Paris, France.
Crown Battery Co.—992 Southern Blvd., New York City.
Dayton Electrical Mfg. Co.—87 St. Clair St., Dayton, Ohio.
Delta Mfg. Co.—Bloomfield, N. J.
Dinin, A.—2 quai National, Puteaux, France.
Eastern Carbon Works.—West Bergen, Jersey City, N. J.
Edison Storage Battery Co.—Orange, N. J.
Electric Contract Co.—202 Centre St., New York City.
Elkhart Brass Mfg. Co.—Prospect St., Elkhart, Ind.
Empire State Dry Battery Co.—70 Fulton St., New York City.
Fleischmann, M.—Titaniawerke, Vienna, Austria.
French Battery Co.—Madison, Wis.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
Gianoli, L.—26 bvd. Magenta, Paris, France.
Guérot.—54 rue Daguerre, Paris, France.
Gordon Battery Co.—223-231 E. 144th St., New York City.
Gould Storage Battery Co.—25 W. 33rd St., New York City.
H. & H. Dry Battery Co.—754 Michigan St., South Bend, Ind.
Hellesens Enke & V. Ludwigsen.—17 Blaagaardsgade, Copenhagen, Denmark
Henrique, Jean-François.—54 quai de Courbevoie, Courbevoie, France
Holcombe & Co.—45 Vesey St., New York City.
Holtzer-Cabot Electric—Mass.
Hunt, A. H.—115 Cannon St., England.
Koener Accumulator C—Ave., Chicago, Ill.
Leblond et Commun.—France.
Leclanché et Cie.—158 rue Card Paris, France.

BATTERIES—PRIMARY (Continued)

- Lacoste et Cie.**—28 bvd. Strasbourg, Paris, France.
Leng's Son & Co., John S.—33 Murray St., New York City.
Lincoln Electric Co.—1-3 Union Square, New York City.
Maljournal et Bourron.—11 Croix-Jordan, Lyons, France.
Mambret et Cie.—25 rue de la Montagne-Ste-Genevieve, Paris, France.
Manhattan Electric Supply Co.—17 Park Pl., New York City.
Meunier, Bombal et Delung.—14 rue Mareschal, Chaumont, Haute-Marne, France.
National Carbon Co.—Cleveland, Ohio.
Nungesser Electric Battery Co.—3519 King Ave., N. E., Cleveland, Ohio.
Perez et Cie.—50 rue Paradis, Paris, France.
Philadelphia Storage Battery Co.—Emerald & Tioga Sts., Philadelphia, Pa.
Redon, E.—Cazoules, Dordogne, France.
Roche, William.—40 W. Broadway, New York City.
Rock Island Battery Co.—9th & Sycamore Sts., Cincinnati, Ohio.
Semi-Dry Battery Co., The.—Fifth & Essex Sts., Harrison, N. J.
Siemens und Halske Actiengesellschaft.—94 Markgrafenstrasse, Berlin, Germany.
Silverberg, F.—Copenhagen, Denmark.
Société Anonyme Le Carbone.—12 rue de Lorraine, Levallois, France.
Société d'Electricité Nilmeloi.—47 rue Lacordaire, Paris, France.
Société Électrique Hydra.—60 bvd. Clichy, Paris, France.
Société Indo-Chinoise Industrielle.—20 rue Richer, Paris, France.
Société Levitas.—128 rue du Bois, Levallois, France.
Stackpole Battery Co.—St. Mary's, Pa.
Tardy, A.—17 Faubourg Saint-Jacques, Valence, Dome, France.
Tray Plate Battery Co., The.—5 Frederick St., Binghamton, N. Y.
Vivax Storage Battery Co.—2228 Michigan Ave., Chicago, Ill.
Western Electric Co.—259 S. Clinton St., Chicago, Ill.
Wierss et Cie.—Liestal, Switzerland.

BATTERIES—STORAGE

- Accumulateurs, T. E. M.**—24 rue Folie-Méricourt, Paris, France.
American Battery Co.—170-172 S. Clinton St., Chicago, Ill.
Auto Specialty Co.—6 E. Madison St., Chicago, Ill.
Battery Power Co.—247-253 Madison St., Milwaukee, Wis.
Berliner Akkumulatoren-Werke.—Chausseestrasse 59, Neusilberhof, Berlin, Germany.

BATTERIES—STORAGE (Continued)

- B. G. S., Société Nouvelle des Accumulateurs.**—34 rue Pierret, Neuilly-sur-Seine, France.
Blin.—53 bis, rue Croulebarde, Paris, France.
Bluemel, & Bros., C. W.—Wolston, Coventry, England.
St., New Cross, London, E., England.
Charter & Co.—303 Dearborn St., Chicago, Ill.
Chicago Battery Co.—Michigan Ave. & 14th St., Chicago, Ill.
Clark & Co., A. F.—2130 W. Susquehanna Ave., Philadelphia, Pa.
Commelin R. Viau et Cie.—45 rue Levis, Paris, France.
Commercial Battery Co.—204-206 Michigan St., Chicago, Ill.
Commercial Storage Battery Co.—147 W. Jackson Blvd., Chicago, Ill.
Compound, Allumage Électrique.—135 ave de Villiers, Paris, France.
Croftan Storage Battery Co.—423-425 W. Queen St., Toronto, Canada.
Dayton Electrical Mfg. Co.—87 St. Clair St., Dayton, Ohio.
Dinin, A.—2 quai National, Puteaux, France.
Dora, Societa Industriale Italiana.—Genoa, Italy.
Edison Storage Battery Co.—Orange, N. J.
Electric Ignition Co.—Sparkbrook, Birmingham, England.
Electric Storage Battery Co.—Allegheny Ave. & 19th St., Philadelphia, Pa.
Electric Vehicle & Supply Co.—621 Grand Ave., Milwaukee, Wis.
Empire State Dry Battery Co.—70 Fulton St., New York City.
Evansville Battery & Electrical Co.—Evansville, Ind.
Expert-Bezañcon.—187 rue du Chateaudes-Rentiers, Paris, France.
Fuller & Sons, John C.—Woodland Works, Wick Lane, Bow, London, E., England.
Fulmen, Société Nouvelle de l'Accumulateur.—18 quai de Clichy, Clichy, France.
Gadot, A.—90 route de la Révolte, Levallois, France.
Geiszler Bros.—316 W. 42nd St., New York City.
General Accumulator & Battery Co.—152 2nd St., Milwaukee, Wis.
Giffard, Victor.—54 rue de Bondy, Paris, France.
Gould Storage Battery Co.—25 W. 33rd St., New York City.
Gramme, Société.—20 rue d'Hautpoul, Paris, France.
Hagen, Gottfried.—Kalk bei Köln, Germany.
Hanaire, Société des Accumulateurs.—7 rue Danton, Levallois-Perret, France.

BATTERIES—STORAGE (Continued)

Hanna Storage Battery Co.—McCordsville, Ind.
Haschke Compound Storage Battery Co.—89 Ashland Blvd., Chicago, Ill.
Hatch Accumulator Co.—Charlestown, Boston, Mass.
Hec.—6 place Voltaire, Paris, France.
Heinz.—27 rue Cave, Levallois-Perret, France.
Helios Mfg. Co.—Bridesburg, Philadelphia, Pa.
Hennegrave et Agnus.—30 rue Perrier, Levallois-Perret, France.
Hensel Battery & Mfg. Co.—Michigan Ave., & Eldredge Court, Chicago, Ill.
Hensemberger.—Monza, Lombardy, Italy.
Invicta, Société.—5 rue Devés, Neuilly, France.
Jeantaud.—51 rue de Ponthieu, Paris, France.
Kitsee Storage Battery Co.—Wilkesbarre and Philadelphia, Pa.
Lacoste et Cie.—28 bvd. de Strasbourg, Paris, France.
Look Electric Co.—1545 Michigan Ave., Chicago, Ill.
Macrae, Hector.—310 St. Paul St., Baltimore, Md.
Max, Société des Accumulateurs.—33 rue Perrier, Levallois-Perret, France.
Michigan Storage Battery Co.—24 Atwater St., E., Detroit, Mich.
Muller, Albert.—205 W. 41st St., New York City.
National Battery Co.—Buffalo, N. Y.
New England Motor Co.—Liberty Square, Lowell, Mass.
Northwestern Storage Battery Co.—448 Milwaukee St., Milwaukee, Wis.
Odor Akkumulatoren und Elemente-Fabrik.—Schkeuditz 2, bei Leipsig, Germany.
Pearson.—Abbot Road, Poplar, London, E., England.
Peerless Ignition Mfg. Co.—947 Marcy Ave., at Fulton St., Brooklyn, N. Y.
Perrett Storage Battery Co.—17 State St., New York City.
Peto & Radford, Ltd.—100 Hatton Garden, London, E. C., England.
Pile Bloc Co.—253 Broadway, New York City.
Prested Miners Gas Indicating Electric Lamp Co., Ltd.—Albert Works, Elthorne Road, Holloway, London, W., England.
Rapid Akkumulatoren und Motorenwerke.—Hauptstrasse 140, Berlin-Schöneberg, Germany.
Richford & Co.—52a High Holborn, London, England.
Royal Battery Co.—108-110 Duane St., New York City.
Ruprecht Electrical Co.—769 Cedar Ave., Cleveland, Ohio.

BATTERIES—STORAGE (Continued)

Saxonia Akkumulatorenwerke.—30 Kreuzbergerstrasse, Berlin, Germany.
Schmidt, Société Anonyme des Accumulateurs.—10 rue Fournier, Clichy, Seine, France.
Schug Electric Co., The.—326 Jefferson Ave., Detroit, Mich.
Seidemann und Co.—Ritterstrasse 9, Berlin, Germany.
Siecke und Schultz.—Berlin, S. W., Germany.
Smith Storage Battery Co.—198 State St., Binghamton, N. Y.
Storage Battery Supply Co.—239 E. 27th St., New York City.
Syracuse Auto Supply Co.—118-120 S. State St., Syracuse, N. Y.
Thompson & Co., T. W.—28 Deptford Bridge, Greenwich, England.
Toledo Storage Battery Co.—102 Oliver St., Toledo, Ohio.
Tray Plate Battery Co., The.—5 Frederick St., Binghamton, N. Y.
Tritt Electric Co.—301 Division St., Union City, Ind.
United Motor Industries, Ltd.—Sherbourne Works, Coventry, England.
United States Battery Co.—New Rochelle, N. Y.
Universal Electric Storage Battery Co.—Offices, 108 La Salle St.; factory, 36-38 Union Park Place, Chicago, Ill.
Vandervell & Co., C. A.—Warple Way, Acton Vale, London, W., England.
Vesta Accumulator Co.—1336 Michigan Ave., Chicago, Ill.
Vivax Storage Battery Co.—2228 Michigan Ave., Chicago, Ill.
Volta Storage Battery Co.—Monadnock Bldg., Chicago, Ill.
Wedekind, Adolp.—Hamburg, Germany.
Western Storage Battery Co.—Indianapolis, Ind.
Willard Storage Battery Co.—1279-81 Bank St., Cleveland, Ohio.
Witherbee Igniter Co.—541 W. 43rd St., New York City.
Witherbee Mfg. Co., Inc.—433 W. 42nd St., New York City.
Zédeco, Société des Accumulateurs.—97 rue Saint Lazare, Paris, France.

BEARINGS—BALL

American Ball Bearing Co.—Edgewater Park & L. S. & M. S. Ry., Cleveland, Ohio.
American Ball Co.—Cor. Kinsley & Eagle St., Providence, R. I.
Auburn Ball Bearing Co.—N. Y.
Auto-Machinery Co., Ltd.—England.
Bantam Anti-Friction Co.—B Conn.
Breger et Neveux.—50 rue des Ma Paris, France.

BEARINGS—BALL (Continued)

Cambon fils.—Rozières-sur-Mouzon. Vosges, France.
Chapman Ball Bearing Co.—40 Bristol St., Boston, Mass.
Critchley Machine Screw Co.—25 Union St., Worcester, Mass.
Dénes, Friedmann und Co.—14 Stubenring, Vienna, Austria.
Deutsche Waffen und Munitionsfabriken. Dorotheenstrasse 44, Berlin, Germany.
Fichtel und Sachs.—Schweinfürth, Germany.
Gusstahlgugelfabrik Bamberg, Heim und Co.—Bamberg, Germany.
Hess Bright Mfg. Co.—19th & Hamilton Sts., Philadelphia, Pa.
Hoffer, Fr.—38 bis, rue Vivienne, Paris, France.
Hoffman Mfg. Co.—Chelmsford, England.
Incerti e Ca., R.—Villar Perosa, Pine-
 rolo, Italy.
Kugelfabrik Fischer Actiengesellschaft. Schweinfürth, Germany.
Malicet et Bliin, Établissements.—103
 ave. de la République, Aubervilliers,
 France.
New Departure Mfg. Co.—Bristol, Conn.
Pennsylvania Ball & Roller Bearing Co.
 —Girard, Pa.
Pressed Steel Mfg. Co.—454 The Bourse,
 Philadelphia, Pa.
Schaeffer und Co.—Schweinfürth, Ger-
 many.
Schmid Roost.—Oerlikon, Switzerland.
Société Française de Petit Outillage.—
 71 bvd. National, Clichy, Seine, France.
Société Française des Roulements a
Billes.—70 rue Franklin, Ivry-Port,
 Seine, France.
Standard Roller Bearing Co.—48th St.
 & Girard Ave., Philadelphia, Pa.
Star Ball Bearing Axle Co.—Princeton,
 Ill.

BEARINGS—ROLLER

American Roller Bearing Co.—Tripp St.,
 South Framingham, Mass.
Hyatt Roller Bearing Co.—427 Middle-
 sex St., Harrison, N. J.
McKeel & Co., Geo. A.—Jackson, Mich.
Ney, G.—128 rue St. Maur, Paris, France.
Pennsylvania Ball & Roller Bearing Co.
 —Girard, Pa.
Radial Bearing Co., The.—508 Broad St.,
 Trenton, N. J.
ler Bearing Co.—48th St.
 ve., Philadelphia, Pa.
en Roller Bearing Axle Co.—Can-
 Ohio.
is Co.—Eddyston, Pa.

BELLS

ctrical Co.—Ansonia, Conn.
in Broc. Co.—East Hampton, Conn.
report Brass Co.—Bridgeport, Conn.

BELLS (Continued)

Cole & Son.—Rockford, Ill.
East Hampton Bell Co.—East Hampton,
 Conn.
Edwards & Co.—405 E. 144th St., New
 York City.
Gong Bell Mfg. Co.—East Hampton,
 Conn.
Hill Brass Co., N. N.—East Hampton,
 Conn.
Holtzer-Cabot Electric Co.—Brookline,
 Mass.
Liberty Bell Co.—Bristol, Conn.
Manhattan Electrical Supply Co.—17
 Park Pl., New York City.
Mossberg Co., Frank.—S. Main and Mill
 Sts., Attleboro, Mass.
New Departure Mfg. Co.—Bristol,
 Conn.
Proctor-Raymond Mfg. Co.—Detroit,
 Mich.

BELTING—LEATHER

American Belting Co.—135 Oliver St.,
 Boston, Mass.
Bickford & Francis Belting Co.—35 Pearl
 St., Buffalo, N. Y.
Boston Belting Co.—90 Pearl St., Buffalo,
 N. Y.
Brophy Belting & Supply Co.—La
 Grange, Ill.
Buffalo Belting Works.—137 Washington
 St., Buffalo, N. Y.
Buffalo Mill Supply Co.—210-212 Main
 St., Buffalo, N. Y.
Buffalo Weaving & Belting Co.—234
 Chandlee St., Buffalo, N. Y.
Chicago Rawhide Mfg. Co.—75-77 Ohio
 St., Chicago, Ill.
General Mercantile Co.—905-906 Mutual
 Life Bldg., Buffalo, N. Y.
Main Belting Co.—40 Pearl St., Buffalo,
 N. Y.
Mayer, H. F.—77 Washington St., Buf-
 falo, N. Y.
Mey Chain Belting Works.—77 Washing-
 ton St., Buffalo, N. Y.
New York Belting & Packing Co., Ltd.—
 600 Prudential Bldg., Buffalo, N. Y.
 mazoo, Mich.
Peerless Belting Co.—78 Main St., Buf-
 falo, N. Y.
Rahmann & Co., Geo.—6 Ferry St., New
 York City.
Republic Belting & Supply Co.—1616 W.
 3rd St., Cleveland, Ohio.

BELTING—WIRE

Philadelphia Steel & Wire Co.—525
 Commerce St., Philadelphia, Pa.
Webb Mfg. Co.—60 Shipman St., New-
 ark, N. J.

BLANKS—GEAR

Funk Engineering Co.—39-45 14th St.,
 Hoboken, N. J.
Gautier & Co., D. G.—20 Cliff St., New
 York City.

BLANKS—GEAR (Continued)

Gill & Sons Forge & Machine Works,
P. H.—Brooklyn, N. Y.
Granger's Drop Forge Works.—Chicago,
Ill.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Michigan Automobile Co., Ltd.—Kalamazoo, Mich.
New England Forge Co.—9 Plymouth St., Worcester, Mass.

BLOWERS

American Blower Co.—Detroit, Mich.
Buffalo Forge Co.—Buffalo, N. Y.
Cincinnati Electric Tool Co., The.—650-652 Evans St., Cincinnati, Ohio.
Crocker-Wheeler Co.—Ampere, N. J.
Ohio Blower Co.—Cleveland, Ohio.—

BODIES—METAL AND WOOD

A. Z. Co., The.—527 W. 56th St., New York City.
Abresch Co., Charles.—398 Fourth St., Milwaukee, Wis.
Achard-Fontanel et Cie.—48 chemin Ste-Geneviève, Lyons, France.
Allsio, Societa Anonima.—19 via Orto Botanico, Turin, Italy.
Amesbury Metal Body Co.—Cor. Clark & Elm Sts., Amesbury, Mass.
Armbruster, S.—4 Porzellangasse, Vienna, Austria.
Armstrong & Co., M.—433 Chapel St., New Haven, Conn.
Auto Body & Finishing Co.—Amesbury, Mass.
Auto Body Co., The.—Franklin Ave., Lansing, Mich.
Auto Equipment Co., The.—1424-26 Michigan Ave., Chicago, Ill.
Babcock Co., H. H.—Factory Sq., Watertown, N. Y.
Banker Bros. Co.—Baum & Beatty Sts., Pittsburg, Pa.
Barndt-Johnson Auto Supply Co., The.—422 Donaldson St., Columbus, Ohio.
Belvallette.—21 rue Duret, Paris, France.
Biddle & Smart Co.—Amesbury, Mass.
Blue Ribbon Auto & Carriage Co.—130-170 Cannon St., Bridgeport, Conn.
Bocquet, J.—rue Jacques-Dalphin, Carouge-Genève, Switzerland.
Borbein Auto Co.—2109-11 N. 9th St., St. Louis, Mo.
Borchers Tonneau Mfg. Co.—Dayton, Ohio.
Botiaux et Cie.—28 rue Greffuhle, Levallois-Perret, Seine, France.
Brainsby & Sons.—125 Long Acre, London, W. C., England.
Brewster & Co.—47th St. & Broadway, New York City.
Bridgeport Vehicle Co.—Water & South Ave., Bridgeport, Conn.
Briggs Carriage Co.—Amesbury, Mass.

**BODIES—METAL AND WOOD
(Continued)**

Broc. Co., The.—40th St. & Payne Ave., Cleveland, Ohio.
Brunn's Carriagé Manufactory Co.—1140 Main St., Buffalo, N. Y.
Buffalo Auto Body & Trimming Co.—338 Ellicott St., Buffalo, N. Y.
Buob & Scheu.—408 E. Court St., Cincinnati, Ohio.
Cappelli e Ca.—Corso Cavour, Brescia, Italy.
Carlisle Body & Gear Works.—Carlisle, Pa.
Carriage Woodstock Co.—Owensboro, Ky.
Carrosserie Rhéda.—97 rue Nationale, Ivry-Port, Seine, France.
Carrozzeria Ciocca Francesco.—26 via della Zecca, Turin, Italy.
Carrozzeria Italiana e Cesare Sala.—45 corso Sempione, Milan, Italy.
Central Mfg. Co.—Connersville, Ind.
Chicago Coach & Carriage Co.—1223 Michigan Ave., Chicago, Ill.
Closset, Ch.—30 rue Ste-Marie, Liege, Belgium.
Cole & Woop.—48 W. 67th St., New York City.
Connolly Carriage Works, Thomas.—Dubuque, Iowa.
Crawford, G. W. & H. D.—Delhi, N. Y.
Currier-Cameron Co.—85 Elm St., Amesbury, Mass.
Dann Bros. & Co., The.—84 Franklin St., New Haven, Conn.
Dayton Folding Tonneau Co.—1141 N. Main St., Dayton, O.
Delabays, J.—25 bis, rue de Carouge, Geneva, Switzerland.
Demorest, A. L.—New Haven, Conn.
de Ruyter de Messine.—125 bvd. de la Senne, Brussels, Belgium.
Detroit Carriage Co.—Cor. Clay Ave. & St. Aubin Ave., Detroit, Mich.
Detroit Motor Car Supply Co.—1250 Jefferson Ave., Detroit, Mich.
Dieteren frères.—54 chaussée de Charleroi, Brussels, Belgium.
Dunham & Son, D. B.—Rahway, N. J.
Eghers, Th.—Hertogstraase 58, Nimeguen, Holland.
Emond, J. P. & W. H.—474 Parker St., Boston, Mass.
Ernesto Ciocca del fu Giacinto.—22 via Parma, Turin, Italy.
Fabbrica Riuniti di Carrozzeria, C. Castagna e Ca.—19 via Montevideo, Milan, Italy.
Farré, J.—179 calle Aragon, Barcelona, Spain.
Faurax et Cie.—La Jonction, Geneva, Switzerland.
Fellwock Automobile & Mfg. Co.—Evansville, Ind.

BODIES—METAL AND WOOD
(Continued)

- Fenske, H.**, Wagenbau-Anstalt.—Reinickendorferstrasse 78, Berlin, Germany.
- Fickling & Co., Inc.**—154 E. 57th St., New York City.
- Fitzgibbon & Crisp Carriage & Auto Body Co.**—Trenton, N. J.
- Franeau, Société Anonyme des Etablissements.**—15 rue Veyt, Brussels, Belgium.
- Frantz Body Co., The.**—Cor. Stanton Ave., & Gety St., Akron, Ohio.
- Gangloff fils.**—10 bvd. Helvétique. Geneva, Switzerland.
- Geissberger.**—Zürich, Switzerland.
- Goold Co., James.**—Albany, N. Y.
- Graves & Congdon Co.**—Oak St., Amesbury, Mass.
- Gründler, Max.**—Liebenwalderstrasse 31, Berlin, Germany.
- Gyax, J.**—Bienne, Switzerland.
- Haendler, Arthur.**—Heidestrasse 52 Berlin, Germany.
- Hartford Auto Body Works.**—809 Asylum Ave., Hartford, Conn.
- Havens Co., The.**—Kokomo, Ind.
- Hayes Mfg. Co.**—360-370 Maybury Ave., Detroit, Mich.
- Healy & Co.**—51st St. & Broadway, New York City.
- Heilbronn Fahrzeugfabrik inhaft Paul Günther.**—Heilbronn, Germany.
- Hill Mfg. Co.**—25-27 Fuller St., Buffalo, N. Y.
- Hoffman und Schulze.**—Göthen-Anhalt, Germany.
- Holcombe, H. C.**—105 Goffe St., New Haven, Conn.
- Hooper & Co., Ltd., Surrey Works.**—Blackfriars Road, London, S. E., England.
- Horton, H. A.**—127-131 Park St., New Haven, Conn.
- Howarth & Rogers.**—Amesbury, Mass.
- Humberset, A.**—40 bvd. St. Georges, Geneva, Switzerland.
- Hume Carriage Co.**—Amesbury, Mass.
- Jackson Body Co.**—Jackson, Mich.
- Judkins & Sons Co., J. B.**—Merrimac, Mass.
- Kalb & Berger Mfg. Co., Inc.**—1565 Broadway, New York City.
- Karback Automobile & Vehicle Co.**—eb.
ses fils.—125 ave. Malakoff, nce.
one Wagon Works.—Reading, Pa.
Co., C. P.—315-318 Michigan
icago, Ill.
es R.—1257 Niagara St., Buf-
Y.
; H.—Schönewörde bei Kneesebeck,
many.
; Theo.—Cleveland, Ohio.

BODIES—METAL AND WOOD
(Continued)

- Labourdette, Henri.**—35 ave des Champs Elysées, Paris, France.
- Lacie Motor Car Co., Ltd.**—1-5 Poland St., London, England.
- Laclaverie et Gaches.**—9 rue Montrosier, Neuilly-sur-Seine, France.
- Lamplugh et Cie.**—8 rue Ernest-Cognacq, Levallois-Perret, Seine, France.
- Lane, T. W.**—Amesbury, Mass.
- Laporte Carriage Co.**—Laporte, Ind.
- Lawrence & Co., L.**—Newark, N. J.
- Lawton & Co., J. A.**—24 Orchard St., Oxford St., London, W., England.
- Leitch Mfg. Co.**—Amesbury, Mass.
- Limousine & Carriage Mfg. Co.**—35th St. & Michigan Ave., Chicago, Ill.
- Locke & Co.**—218 W. 84th St., New York City.
- Lohner und Co., Jacob.**—2 Porzellan-gasse, Vienna, Austria.
- Maglila e fili.**—10 via Mazzini, Biella, Italy.
- Marousse, J. B.**—30 rue du Moulin, Brussels, Belgium.
- Maythorn & Son.**—Biggleswade, Eng-land.
- McFarlane Wagon Works.**—100 W. Har-ison St., Chicago, Ill.
- McNaught & Co.**—Worcester, England.
- Mettewie-Debrie, J.**—13 rue de France, Brussels, Belgium.
- Michel et fils.**—25 rue de France, Brus-sels, Belgium.
- Middletown Auto Body Co.**—Middle-town, Conn.
- Miller & Co., A. J.**—Bellfontaine, Ohio.
- Miller Bros.**—Amesbury, Mass.
- Minogue Body & Seat Co.**—Kansas City, Mo.
- Moore & Munger Co.**—602 W. 52nd St., New York City.
- Morgan & Co., Ltd.**—10 Old Bond St., London, W., England.
- Motor Top Co. of New York.**—216 W. 50th St., New York City.
- Mount & Bros., J. W.**—Red Bank, N. J.
- Mullaner, Ltd.**—Northampton, England.
- Mullins Co., W. H.**—Salem, Ohio.
- Neustadt Auto & Supply Co.**—3948-50 Olive St., St. Louis, Mo.
- New Haven Carriage Co.**—New Haven, Conn.
- Nichols & Son, D. P.**—116-122 W. Brook-line St., Boston, Mass.
- Ohio Blower Co., The.**—330 Prospect Ave., N. W., Cleveland, Ohio.
- Ohio Carriage Body Co.**—Bellefontaine, Ohio.
- Ohio Scroll & Lumber Co.**—Covington, Ky.
- Paulus et fils, J.**—Marchiennes au Pont, Belgium.
- Pease & Sons, S. C.**—Merrimac, Mass.
- Peez & Hoffman.**—3rd St., near Fowler, Milwaukee, Wis.

BODIES—METAL AND WOOD
(Continued)

Pennsylvania Auto Metal Body Mfg. Co.—Sinking Springs, Pa.
Petzelt & Keyser.—24th & Locust Sts., Philadelphia, Pa.
Pohle, Oskar.—Dresden N., Germany.
Pontiac Body Co.—Pontiac, Mich.
Quinby & Co., J. M.—21-39 Division St., Newark, N. J.
Quinsler & Co.—26-30 Cambria St., Boston, Mass.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Reading Metal Body Co.—Reading and Fleetwood, Pa.
Rech & Sons, Jacob.—8th St. & Girard Ave., Philadelphia, Pa.
Ritter Mfg. Co.—242 Jefferson Ave., Detroit, Mich.
Riverside Body Factory.—Buffalo, N. Y.
Robbins & Co., Irwin.—32 E. Georgia St., Indianapolis, Ind.
Rothschild.—131 ave. Malakoff, Paris, France.
Safety Buggy Co.—Lancaster, Pa.
Sayres & Co.—Vauxhall, London, England.
Schubert Bros. Gear Co.—42-44 Cedar St., Oneida, N. Y.
Schurmeier Wagon Co.—29 Western Ave., Minneapolis, Minn.
Seabrook & Smith Carriage Co.—126 Park St., New Haven, Conn.
Shields Carriage Co., The.—Amesbury Mass.
Snutzel frères.—9 rue de l'Activite', Brussels, Belgium.
Societa Anonima Carrazzzeria Locati e Torressa.—Barriera di Nizza, Turin, Italy.
Societa Anonima Carrozzzeria Torinese Rossi Russolotti.—Barriera Bornigheri, Turin, Italy.
Societa Carrozzzeria Automobili, Allesio.—Turin, Italy.
Societa Luigi Bellona e Ca.—1 via Sirtori, Milan, Italy.
Société Anonyme l'Auto-Carrosserie.—Rue de Sans-Nom, Gand, Belgium.
Société Suisse de Carrosserie en Automobiles.—26 rue de la Coulouvrenière, Geneva, Switzerland.
South Broad Automobile Co.—729 S. Broad St., Philadelphia, Pa.
Springfield Metal Body Co.—Birney Ave., Springfield, Mass.
Starey, Ltd.—Nottingham, England.
Stearns & Co., Walter H.—540-550 W. 58th St., New York City.
Stewart & Co., Hugh.—414 Main St., Cambridgeport, Mass.
Stivers, R. M.—19-21 W. 62nd St., New York City.

BODIES—METAL AND WOOD
(Continued)

Stone & Sons, C.—167 Ogden St., Chicago, Ill.
Studebaker Bros. Mfg. Co.—378 Wabash Ave., Chicago, Ill.
Taurus, Societa Anonima por Accions.—48 bis, via San Chiara, Turin, Italy.
Terre Haute Carriage & Body Co.—101 Wabash Ave., Terre Haute, Ind.
Thompson Co., E. J.—5917-19 Penn Ave., Pittsburg, Pa.
Thom, W. & F.—Ranelagh House, Lower Grosvenor Pl., London, S. W., England.
Trutz, N.—Coburg, Germany.
Union City Body Co.—Factory, W. Pearl St., Union City, Ind.
Van den Plas.—6 rue des Drapiers, Brussels, Belgium.
Védrine et Cie, A.—7 quai de Seine, Courbevoie, Seine, France.
Veit und Co., W. F., Wagen und Karrosseriefabrik.—Urbanstrasse 67, Berlin, Germany.
Vinet et Boulogne.—61 rue de Villiers, Neuilly-sur-Seine, France.
Vogt.—30 rue du Vieux-Mayeur, Liège, Belgium.
Wagner und Co., Wagenfabrik.—Brandenburg, Germany.
Walker Carriage Co.—Merrimac, Mass.
Wilcox, M. E.—Providence, R. I.
Willoughby Co.—86 Genesee St., Utica, N. Y.
Wilson Body Co., C. R.—Detroit, Mich.
Windham Patent Bodies.—Chapham Junction Station, London, England.
Winter, Gustav.—Zittau, Germany.
Wogaman, J. Webster.—Union City, Ind.
Wood & Son, Frederick R.—219 W. 19th St., New York City.
York Wagon Gear Co.—York, Pa.
Young Carriage Co., Wm.—4524 Delmar Ave., St. Louis, Mo.
Zimmerman et Cie.—22ter bvd. Bourdon, Neuilly-sur-Seine, France.
Zimmerman & Sons, F. F.—Waupun, Wis.

BOILERS

Kero-Steam Co. (Waite & Son Co.).—102 Fulton St., Manhattan; factory, East Orange, N. J.
Lunkenheimer Co., The.—Cincinnati, O.
Offeldt & Sons, F. W.—N Hudson, N. Y.
Parker, Surrey.—Pinetown,
Walker & Co., E. C.—1913-23 Log, Louisville, Ky.

BOLTS

American Iron & Steel Mfg. Co.—anon, Pa.
Atlas Bolt & Screw Co., The.—Cleveland, Ohio.

BOLTS (Continued)

Buffalo Bolt Co.—East Ave. and Olliver St., Tonowanda, N. Y.
Chicago Screw Co.—2 N. Canal St., Chicago, Ill.
Clark Bros. Bolt Co.—Milldale, Conn.
Cleveland Cap Screw Co.—2216 Clarkwood Road, Cleveland, Ohio.
Columbus Bolt Works.—162 W. Randolph St., Columbus, Ohio.
Corbin Screw Corporation, The.—New Britain, Conn.
Detroit Screw Works.—Riopelle & Franklin Sts., Detroit, Mich.
Feine, August.—152 Terrace St., Buffalo, N. Y.
Franklin Moore Co.—Winsted, Conn.
Galvanizing Co., The.—525 N. Front St., Philadelphia, Pa.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Kirk Latty Co.—Cleveland, Ohio.
Lamson & Sessions Co.—412-453 Scranton Ave., Cleveland, Ohio.
National Screw & Tack Co.—Cleveland, Ohio.
National Sewing Machine Co.—Belvidere, Ill.
Peninsula Milled Screw Co.—751 Bellevue Ave., Detroit, Mich.
Republic Iron & Steel Co.—Stock Exchange Bldg., Chicago, Ill.
Union Steel Screw Co.—Cleveland, Ohio.
Upson Bolt & Nut Co.—Cleveland, Ohio.
Western Automatic Machine Screw Co., The.—Elyria, Ohio.
Worcester Machine Screw Co.—Worcester, Mass.

BOOKS—TOURING RECORD

Winship, W. W.—71 Summer St. & 11 Kingstone St., Boston, Mass.

BONDS—AUTOMOBILE BAIL

National Surety Co.—346 Broadway, New York City.

BOW—SEPARATORS

Amesbury Brass & Foundry Co.—Amesbury, Mass.
Cowles & Co., C.—New Haven, Conn.
Evans Mfg. Co.—118 N. Brookline St., Boston, Mass.
Brass Works.—13-15 Macomb St., Detroit, Mich.
Harper Co., Walter J.—229-231 Mulberry St., Newark, N. J.
Huber Tire Co.—477 Wabash St., Chicago, Ill.
Indian Top Co.—17 Duffield St., Detroit, Mich.
May Co., G. W. J.—Merrimac, Mass.
McIsaac Mfg. Co.—51-55 Macomb St., Detroit, Mich.

BOW—SEPARATORS (Continued)

Springfield Auto Top & Upholstering Co.—102-106 Dwight St., Springfield, Mass.
Victor Rubber Co., The.—Springfield, Ohio.

BOWS—TOP

Brown & Co., S. N.—Dayton, Ohio.
Harper Co., Walter J.—229-231 Mulberry St., Newark, N. J.
Roehm & Davison, Ltd.—91-95 West Woodbridge St., Detroit, Mich.
Shepard & Sons.—New Haven, Conn.
Union Bow Co.—421 Superior Ave., N. W., Cleveland, Ohio.
Wheel & Wood Bending Co., The.—141 John St., Bridgeport, Conn.

BOXES—BATTERY

Churchill Cabinet Co.—72 Churchill St., Chicago, Ill.
Detroit Auto Specialty Co.—909-911 Greenwood Ave., Detroit, Mich.
Fikling & Co., Inc.—154 E. 57th St., New York City.
Hayes Mfg. Co.—360-370 Maybury Ave., Detroit, Mich.
Jackson Mfg. Co.—614 7th St., Denver, Colo.
Kinsey Mfg. Co.—Dayton, Ohio.
Mullins Co., W. H.—Salem, Ohio.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
West Box Co., F. M.—225 Liberty St., Springfield, Mass.

BOXES—COIL

Auto Body Co., The.—Franklin Ave., Lansing, Mich.
Churchill Cabinet Co.—72 Churchill St., Chicago, Ill.
Kundtz, Theo.—Cleveland, Ohio.
Murry, W. F.—28 Beach St., Boston, Mass.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
West Box Co., F. M.—225 Liberty St., Springfield, Mass.

BOXES—TOOL

A. Z. Co., The.—527 W. 56th St., New York City.
American Steel Barrel Co.—204-206 Varet St., Brooklyn, N. Y.
Bridgeport Vehicle Co.—South & Water Sts., Bridgeport, Conn.
Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Centaur Motor Co.—59 Franklin St., Buffalo, N. Y.
Detroit Auto Specialty Co.—909-911 Greenwood Ave., Detroit, Mich.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Gray & Sons, Peter.—90 Union St., Boston, Mass.

BOXES—TOOL Continued)

Hayes Mfg. Co.—360-370 Maybury Ave., Detroit, Mich.
Jordan, E. B., Jr.—873 Union St., Brooklyn, N. Y.
Mason, John A.—1312-16 Washington St., Newton, Mass.
Noye Mfg. Co.—50 Lake View Ave., Buffalo, N. Y.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
Teel Mfg. Co.—Medford, Mass.
West Box Co., F. M.—225 Liberty St., Springfield, Mass.

BRACKETS—LAMP

A. & J. Mfg. Co.—26 W. Randolph St., Chicago, Ill.
American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill.
Automatic Headlight Attachment Mfg. Co.—33rd and K Sts. N. W., Washington, D. C.
Cramp & Sons Ship & Engine Bldg. Co.—Philadelphia, Pa.
Crosby Co.—Buffalo, N. Y.
Eco Mfg. Co.—53 State St., Boston, Mass.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Halderman, O. A.—Marion, Ind.
Ham Mfg. Co., C. T.—137 Oak St., Rochester, N. Y.
Harper Co., Walter J.—229-231 Mulberry St., Newark, N. J.
Imperial Brass Mfg. Co.—245-247 S. Jefferson St., Chicago, Ill.
Keim Mills, Inc., John R.—Kensington Ave. & Erie Tracks, Buffalo, N. Y.
Kelly Handle Bar Co.—Cleveland, Ohio.
Manhattan Storage Co.—1611 Broadway, New York City.
Motor Car Supply Co., The.—1425-27 Michigan Ave., Chicago, Ill.
New York Coach & Auto Lamp Co.—794-98 Tenth Ave., New York City.
Northway, J. Thompson.—102 Exchange St., Rochester, N. Y.
Ohio Brass Co.—Mansfield, Ohio.
Pyle Mfg. Co.—2211 Park Ave., Indianapolis, Ind.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Smith & Co., Jos. N.—Fourth & Porter St., Detroit, Mich.
Worcester Pressed Steel Co.—North & Barber Aves., Worcester, Mass.

BRACKETS, TIRE, see HOLDERS, TIRE

BRAKES

Corbin Screw Corp., The.—New Britain, Conn.
Garage Equipment Co.—Milwaukee, Wis.
Garford Co., The.—Elyria, Ohio.

BRAKES (Continued)

Globe Machine & Stamping Co.—3868 Hamilton Ave., N. E., Cleveland, Ohio.
Hatcher Auto Parts Co.—2108 Superior Ave., Cleveland, Ohio.
Kalisch Air Brake Co.—1317 Chestnut St., St. Louis, Mo.
Konigslow Mfg. Co., Otto.—2279 Clarkwood Road, Cleveland, Ohio.
Malthy Automobile & Mfg. Co.—Brooklyn, N. Y.
Moon Apex Brake Co., The.—Third & Porter St., Detroit, Mich.
Portland Garage Co.—Portland, Me.
Reading Automobile Co.—26 S. 5th St., Reading, Pa.
Royal Equipment Co.—165 Housatonic Ave., Bridgeport, Conn.
Standard Brake Co., The.—101 W. 66th St., New York City.
Sturtevant Mill Co.—Harrison Square, Boston, Mass.
Warner Clutch Co.—1461 Michigan Ave., Chicago, Ill.
Whipple, R. W.—169 State St., Binghamton, N. Y.

BRASS CASTINGS, see CASTINGS, ALUMINUM, BRASS, BRONZE AND COPPER

BRASS—SHEET AND ROD

Ansonia Brass & Copper Co.—99 John St., New York City.
Besley & Co., C. H.—15-21 S. Clinton St., Chicago, Ill.
Bridgeport Brass Co.—Bridgeport, Conn.
Chicago Brass Co.—Kenosha, Wis.
Coe Brass Mfg. Co.—Torrington, Conn.
Cramp & Sons Ship & Engine Building Co.—Philadelphia, Pa.
Detroit Copper & Brass Rolling Mills.—Detroit, Mich.
Hendricks Bros.—49 Cliff St., New York City.
Hungerford Brass & Copper Co.—Pearl and Park Sts., New York City.
Hussey & Co., C. G.—Pittsburg, Pa.
Manhattan Brass Co.—332 E. 28th St., New York City.
New Haven Copper Co.—New Haven, Conn.
Plume & Atwood Mfg. Co.—Waterbury, Conn.
Randolph-Clowes Co.—Waterbury, Conn.
Rome Brass & Copper Co.—
Seymour Mfg. Co.—Seymour
Scoville Mfg. Co.—Waterbury
Taunton-New Bedford—
 Taunton, Mass.
Waterbury Brass Co.

BRAZING—C

A. Z. Co., The.—527 W. 56th York City.
Cast Iron Brazing & Mfg. Co.—Chester, N. H.

BRAZING—CYLINDERS, ETC.

(Continued)

- Enterprise Machine Works.**—308 N. 5th St., Richmond, Va.
Midgley Mfg. Co.—Columbus, O.
Ohio Blower Co., The.—330 Prospect Ave., N. W., Cleveland, Ohio.
White Mfg. Co.—72 S. Canal St., Chicago, Ill.

**BRONZE CASTINGS, see CASTINGS
 ALUMINUM, BRASS, BRONZE
 AND COPPER**

BUCKETS—COLLAPSIBLE

- Abercrombie & Fitch.**—57 Reade St., New York City.
Duplex Folding Pail Co.—420 W. 14th St., New York City.
Goodrich, B. F. Co.—Akron, Ohio.
Gutta Percha & Rubber Mfg. Co.—126 Duane St., New York City.
Hodgman Rubber Co.—806 Broadway, New York City.
Knowles, C. S.—7 Arch St., Boston, Mass.
National India Rubber Co.—Bristol, R. I.
Rue Mfg. Co.—215 Race St., Philadelphia, Pa.

BUFFERS

- Chicago Pneumatic Tool Co.**—1010 Fisher Bldg., Chicago, Ill.
Coates Clipper Mfg. Co.—Worcester, Mass.
Gem Mfg. Co.—Spruce, near 33rd St., Pittsburgh, Pa.
Long Arm System Co.—Lakeside Ave. & E. 38th St., Cleveland, Ohio.
Victor Electric Co.—55-61 Market St., Chicago, Ill.

BUMPERS—AUTO

- Adapt Machinery Co.**—1624-34 Wabash Ave., Chicago, Ill.
Appliance Mfg. Co.—72-86 W. Jackson Blvd., Chicago, Ill.
Turner Brass Works, The.—72 Michigan St., Chicago, Ill.

BURNERS—GASOLENE

- Forg, Peter.**—Park St., Somerville, Mass.
Liquid Fuel Engineering Co.—Bridgeport, Conn.
Lynn Auto Co.—274 Broad St., Lynn, Mass.
National Equipment Co.—Holland Bldg., St. Louis, Mo.
Offeldt & Sons, August.—123 Liberty St., New York City.
Offeldt & Sons, F. W.—Nyack-on-Hudson, N. Y.
Pedersen Mfg. Co.—400-412 E. 37th St., New York City.
Steam Carriage Boiler Co.—119 W. 1st St., Oswego, N. Y.

BURNERS—GASOLENE (Continued)

- Taunton Motor Carriage Co.**—Taunton, Mass.
Triumph Mfg. Co.—Nashville, Tenn.
Walker & Co., E. C.—1913-23 Logan St., Louisville, Ky.

BURNERS—KEROSENE

- Forg, Peter.**—Park St., Somerville, Mass.
Hydraulic Oil Storage Co.—820 Penobscot Bldg., Detroit, Mich.
Kero-Steam Co. (Waite & Son Co.).—102 Fulton St., New York City; factory, East Orange, N. J.
Liquid Fuel Engineering Co.—Bridgeport, Conn.
Lynn Auto Co.—274 Broad St., Lynn, Mass.
National Equipment Co.—Holland Bldg., St. Louis, Mo.
Offeldt & Sons, August.—123 Liberty St., New York City.
Offeldt & Sons, F. W.—Nyack-on-the-Hudson, N. Y.
Pedersen Mfg. Co.—400-412 E. 37th St., New York City.
Steam Carriage Boiler Co.—119 W. 1st St., Oswego, N. Y.
Taunton Motor Carriage Co.—Taunton, Mass.
Triumph Mfg. Co.—Nashville, Tenn.
Walker & Co., E. C.—1913-23 Logan St., Louisville, Ky.

BURNERS—LAMP

- Acetylene Gas Ill. Co.**—105 Walker St., New York City.
American Lava Co.—29-33 William St., Chattanooga, Tenn.
Carroll, J. B.—90-92 Illinois St., Chicago, Ill.
Crane Co., W. N.—1131-33 Broadway, New York City.
Downing, Chas. J.—54 Warren St., New York City.
Kirchberger & Co.—50 Warren St., New York City.
No-Match Electric Mfg. Co.—141 Milk St., Boston, Mass.
Stewart Mfg. Co. of Canada, D. M.—151 King St., W., Toronto, Canada.

BUTTONS—CLINCH

- Neider Co., Inc., The F. A.**—Augusta, Ky.
New Haven Button Co.—New Haven, Conn.
Roehm & Davison, Ltd.—91-95 W. Woodbridge St., Detroit, Mich.

CANOPIES, see TOPS, AUTOMOBILE AND MOTORBOAT

CANS—OIL

- Akron Mfg. Co.**—927 S. High St., Akron, Ohio.

CANS—OIL (Continued)

Aluminum Mfg. Co.—Two Rivers, Wis.
American Tube & Stamping Co.—Bridgeport, Conn.
Bloomer, R. E.—Keithsburg, Ill.
Brown Oil Can Co.—Dawson St., Toledo, Ohio.
Dover Stamping & Mfg. Co.—385 Putnam Ave., Cambridge, Mass.
Gem Mfg. Co.—Spruce near 33rd St., Pittsburg, Pa.
Hauck-Seebach Co.—291-95 Essex St., Brooklyn, N. Y.
Lavigne Mfg. Co.—Detroit, Mich.
Manufacturers Can Co.—132-36 Mulberry St., Newark, N. J.
Maple City Mfg. Co.—Mommouth, Ill.
Noera Mfg. Co.—Waterbury, Conn.
Pigot, Sayre & Co.—135 William St., New York City.
Scoville Mfg. Co.—Waterbury, Conn.
Sullivan Oil Co.—Chicago, Ill.

CANS—WASTE

Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Cleveland Wire Spring Co.—Cleveland, Ohio.
Dover Stamping & Mfg. Co.—385 Putnam Ave., Cambridge, Mass.

CAPS, see WEARING APPAREL, HATS AND CAPS

CAPS—HUB

Boston Pressed Metal Co.—171-173 Union St., Worcester, Mass.
Chandler Co., The.—31 Taylor St., Springfield, Mass.
Crosby Co.—Buffalo, N. Y.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Imperial Brass Mfg. Co.—245-247 S. Jefferson St., Chicago, Ill.
Keim Mills, Inc., John R.—Kensington Ave. & Erie Tracks, Buffalo, N. Y.
Torrey Roller Bushing Co.—Bath, Me.
Worcester Pressed Steel Co.—North & Barber Aves., Worcester, Mass.

CARBIDE

Acetylene Gas Ill. Co.—105 Walker St., New York City.
Acetyvone Co.—38 Park Row, New York City.
American Carbolite Co.—Constantine, Mich.
Leng's Son & Co., John S.—33 Murray St., New York City.
New Amsterdam Motor Co.—152 W. 56th St., New York City.
Union Carbide Co.—Michigan Ave. & Adams St., Chicago, Ill.

CARBURETTERS—GASOLENE

Acorn Brass Mfg. Co.—51 N. Peoria St., Chicago, Ill.
American Carbureter Co.—907 Michigan Ave., Detroit, Mich.
American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill.
Amoudruz, A.—24 rue d'Armaille, Paris, France.
Aurora Automatic Machinery Co.—421 Claim St., Aurora, Ill.
Auto Improvement Co.—Factory, 316 Hudson St.; sales and show rooms, 2128 Broadway, New York City.
Automatisme, L.—8 bvd. d'Asnières, Neuilly-sur-Seine, France.
Axiom Carbureter Mfg. Co., The.—106 E. 28th St., New York City.
Baird-Banks Mfg. & Supply Co.—35 Warren St., New York City.
Becker, John.—Hyde Park, Mass.
Blanke und Rast.—Leipzig-Plagwitz, Germany.
Bradford Motor Works.—Bradford, Pa.
Breeze Carbureter Co.—276 Halsey St., Newark, N. J.
Brennan Mfg. Co.—Syracuse, N. Y.
Briest.—119 rue de Rennes, Nantes, France.
Brock, A. A.—140 Dearborn St., Chicago, Ill.
Brooklyn Coil & Carburetter Co.—77-79 Adams St., Brooklyn, N. Y.
Brown and Barlow, Ltd.—16 Leveday St., Birmingham, Eng.
Brownell Motor Co., F. A.—634-36 Lexington Ave., Rochester, N. Y.
Boston Steam Specialty Co.—168-170 Congress St., Boston, Mass.
Bowers Co., Inc., The F. E.—307 First Nat'l Bank Bldg., New Haven, Conn.
Buffalo Carbureter Co.—889 Main St., Buffalo, N. Y.
Byrne, Kingston & Co.—339-51 Smith St., Kokomo, Ind.
Camden Anchor-Rockland Machine Co.—Camden, Maine.
Chauffourier, M.—10 rue de Palikao, Paris, France.
Christopher Bros.—1049 Sheffield Ave., Chicago, Ill.
Clemick-Hirsch Co.—594 National Ave., Milwaukee, Wis.
Cross Engine Co., M. O.—800-806 Bellevue Ave., Detroit, Mich.
Culver Novelty Co.—Cu
Cushman Motor Co.—2020 N Lincoln, Neb.
Dalifol et Cie.—40 bvd. d'A: de la Jatte, Neuilly, France.
Dempster Machine Co., The V & Walnut Sts., Kansas City, Mo.
Derby Mfg. Co.—Trenton, N. J.
de Retz.—15 rue de Turenne, France.
Duryea, Chas. E.—Reading, Pa.

CARBURETTERS—GASOLENE
(Continued)

Eckel, Andrew.—1080 3rd Ave., Brooklyn, N. Y.
Eveno, A.—22 ave de Neuilly, Neuilly, Paris, France.
Fast, Otto.—Queenfield & 25th Sts., Milwaukee, Wis.
Gaither-Owen Co.—40 W. 60th St., New York City.
Galvanizing Co.—525 N. Front St., Philadelphia, Pa.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
Generator Valve Co.—294-96 Taaffe Pl., Brooklyn, N. Y.
Gérme, Ch.—37 rue Godot de Mauroy, Paris, France.
Goldberg Motor Car Devices Mfg. Co.—1253 Michigan Ave., Chicago, Ill.
Gould Derby Mfg. Co.—109 N. Broad St., Trenton, N. J.
Grant Mfg. & Machine Co.—90 Sillman Ave., Bridgeport, Conn.
Grouvelle, H. Arquembourg et Cie.—71 rue du Moulin Vert, Paris, France.
Guyot et Cie., Henri.—41 rue St. Ferdinand, Paris, France.
Hagar Carburettor Co.—819 Broadway, Nashville, Tenn.
Hall Co., Inc., E. H.—12 Elm St., Rochester, N. Y.
Heath Dry Gas Co.—1937 Broadway, New York City.
Heitger Carbureter Co.—205-207 W. South St., Indianapolis, Ind.
Hirzel, H.—Leipzig-Plagwitz, Germany.
Holley Bros. Co.—661-75 Beaubien St., Detroit, Mich.
Johnston Machine Co.—86 High St., Woodbury, N. J.
Jourdanet, Baron et Cie.—29 cours Lafayette, Lyon-Villeurbanne, France.
Kalamazoo Carbureter Co.—1301 Grand Ave., Kalamazoo, Mich.
Kaufmann, Chas.—45 S. Main St., Oshkosh, Wis.
Knoblock-Heidemann Mfg. Co.—South Bend, Ind.
Konigslow Mfg. Co., Otto.—2279 Clarkewood Road, Cleveland, Ohio.
Krause, R. E.—8612 Wade Park Ave., Cleveland, Ohio.
Longuemare frères.—12 rue du Buisson, St. Louis, Paris, France.
Autocar Co.—Westfield, Mass.
Valve Co.—35 Great Dover St., London, S. E., England.
Chemical Co.—1303 Michigan Ave., Chicago, Ill.
Mfg. Co.—15½ Virginia Ave., Indianapolis, Ind.
rell & Fitch Co.—218 S. Washington St., Rome, N. Y.
Damper Co.—355 Walnut St., Pottstown, Pa.

CARBURETTERS—GASOLENE
(Continued)

McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Neue Vergasergesellschaft.—Urbanstrasse 63, Berlins, Germany.
Newcomb Carbureter Co.—1900 Broadway, New York City.
North Chicago Machine Co.—North Chicago, Ill.
Nutting Machine Co.—Dayton, Ohio.
O'Brien & Co., W. H.—115 Dearborn St., Chicago, Ill.
Peerless Equipment Co.—170 S. Clinton St., Chicago, Ill.
Pelton Gasoline Engine Works.—Lyons, La.
Pioneer Brass Works.—418-424 S. Penna St., Indianapolis, Ind.
Power Co., J. J.—653 E. Main St., Madison, Wis.
Precision Appliance Co.—832 Austin Ave., Chicago, Ill.
Putnam Motor Mfg. Co.—57 Lebanon St., Springfield, Mass.
Saris, J. H.—Beloit, Wis.
Schmitz und Co., J.—Höchst-am-Main, Germany.
Sherwood Mfg. Co.—Elmwood Ave. & Belt Line, Buffalo, N. Y.
Sintz, Guy L.—Fulton & Front Sts., Grand Rapids, Mich.
Société American des Carburateurs Volcan.—Boulogne-sur-Seine, France.
Société du Carburateur Malzieux.—61 bvd. de Strasbourg, Paris, France.
Sorge und Sabeck.—86 Mauerstrasse, Berlin, N., Germany.
Speed Changing Pulley Co.—750 E. Washington St., Indianapolis, Ind.
Standard Carbureter Co., Inc.—Sabin & Mathewson Sts., Providence, R. I.
Stevens Motor Mfg. Co.—Wolverhampton, England.
Turner & Co., Ltd.—1 George St., Lisbon Grove, London, W., England.
Turner Brass Works, The.—72 Michigan St., Chicago, Ill.
Tyler & Sons.—Belle Isle, King's Cross, London, N., England.
Vanlaethem, L.—4 rue du Débarcadère, Paris, France.
Weidner, Richard.—Leipzig, Germany.
Wheeler & Schebler.—Indianapolis, Ind.
White and Poppe, Ltd.—Coventry, England.
Willett Engine & Carbureter Co.—764 Ellicott Sq., Buffalo, N. Y.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, Ohio.
Wincer & Co., C.—Brace St., Wallsall-on-Thames, England.
Windhoff, Gebrüder.—Rhein-in-Westphalia, Germany.
Winkley Co., The.—226 Abbot St., Detroit, Mich.
Xardell Co., C. A.—Utica, N. Y.

CARBURETTERS—KEROSENE

Putnam Motor Mfg. Co.—57 Lebanon St., Springfield, Mass.

CASES—CRANK AND GEAR

Avery Stamping Co.—5207 Lakeside Ave., N. E., Cleveland, O.

Bridgeport Deoxidized Bronze & Metal Co.—Bridgeport, Conn.

Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.

Cole & Woop.—50 W. 67th St., New York City.

Crosby Co.—Buffalo, N. Y.

Garford Co., The.—Elyria, Ohio.

Heindel Mfg. Co.—Hanover, Pa.

Lunkenheimer Co., The.—Cincinnati, O.

Williams & Son, E. A.—107 Plymouth St., Jersey City, N. J.

Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill.

CASES—MEDICINE, EMERGENCY

Abbey, P. L.—Kalamazoo, Mich.

United States Emergency Case Co.—Utica, N. Y.

CASES—TIRE

Allen Auto Specialty Co.—1931 Broadway, New York City.

Allen Mfg. Co., W. D.—151 Lake St., Chicago, Ill.

Broc Co., The.—1665-67 40th St., N. E., Cleveland, Ohio.

Buob & Scheu.—408 E. Court St., Cincinnati, Ohio.

Burgin Bros.—Springfield, Mass.

Empire Automobile Tire Co.—Trenton, N. J.

Gilbert Mfg. Co.—New Haven, Conn.

Hopewell Bros.—42 Osborn St., Cambridge, Mass.

Inner Shoe Tire Co.—64 Monroe St., Grand Rapids, Mich.

Kimball Tire Case Co.—Council Bluffs, Ia.

Merchant & Evans Co.—517 Arch St., Philadelphia, Pa.

New York Motor Fabric Co.—32 Union Sq., New York City.

Pneumatic Tire Shield Co.—Cedar Rapids, Iowa.

Seitz, C.—207 E. 35th St., New York City.

Teel Mfg. Co.—Medford, Mass.

Vehicle Apron & Hood Co.—Columbus, Ohio.

Vehicle Top & Supply Co.—900 Cass St., St. Louis, Mo.

Wiley & Son Co., Wm. H.—Hartford, Conn.

CASTINGS — ALUMINUM, BRASS, BRONZE AND COPPER

Acorn Brass Mfg. Co.—51 N. Peoria St., Chicago, Ill.

Aetna Brass Mfg. Co.—4800 Hamilton Ave., Cleveland, Ohio.

CASTINGS — ALUMINUM, BRASS, BRONZE AND COPPER (Cont.)

Allen Mfg. Co., W. D.—151 Lake St., Chicago, Ill.

Allyn Brass Fdy. Co., The.—1095 Magara St., Buffalo, N. Y.

Aluminum Foundry Co.—Manitowoc, Wis.

American Brass Foundry Co.—Hyde Park, Mass.

American Castings Co.—809 Columbus S. & F. Bldg., Columbus, Ohio.

American Foundry & Mfg. Co.—Herbert & Wright Sts., St. Louis, Mo.

American Pin Co.—Waterbury, Conn.

Amesbury Brass & Foundry Co.—Amesbury, Mass.

Aurora Motor Works.—North Aurora, Ill.

Bastian Mfg. Co., Chas. L.—76 Illinois St., Chicago, Ill.

Belfield & Co., H.—Philadelphia, Pa.

Breeze Carbureter Co. of New York.—101 W. 66th St., New York City.

Bridgeport Deoxidized Bronze & Metal Co.—Bridgeport, Conn.

Buckeye Iron & Brass Works.—324 3rd St., Dayton, Ohio.

Caldwell Co., The.—136 S. 14th St., Philadelphia, Pa.

Chicago Hardware Foundry Co.—North Chicago, Ill.

Clarke, John W.—Albany, N. Y.

Clayton & Lambert Mfg. Co.—Detroit, Mich.

Clum & Atkinson.—575 Lyell Ave., Rochester, N. Y.

Columbus Brass Co.—Columbus, Ohio.

Day Foundry Co., The.—Illinois & Mary Sts., Buffalo, N. Y.

Deck Bros.—20 Indiana St., Buffalo, N. Y.

Elkhart Brass Mfg. Co.—Prospect St., Elkhart, Ind.

Elm City Brass Co.—New Haven, Conn.

Elyria Machine Parts Co., The.—Elyria, Ohio.

Enterprise Foundry Co.—Detroit, Mich.

Eureka Tempered Copper Works.—Northeast, Pa.

Ferro Machine & Foundry Co.—115 Wade Bldg., Cleveland, Ohio.

Forest City Brass Works.—Cleveland, Ohio.

Fries & Co.—89-93 Main St., Buffalo, N. Y.

Frontier Brass Foundry

Lane, Niagara Falls, N.

Galvin Co., The J. F.—74;

Detroit, Mich.

Gaylord Co., F. L.—Ansonia,

Gerson-Carey Co.—Kalamazoo

S. & M. S. R. R., Lansing, M

Graham, James & Co.—293

New Haven, Conn.

Hendryx & Co., Andre

Haven, Conn.

CASTINGS — ALUMINUM, BRASS, BRONZE AND COPPER (Cont.)

Hercules Float Works.—200 Franklin St., Springfield, Mass.
Hofeller Brass Foundry Co.—100 Terrace, Buffalo, N. Y.
Homer Brass Works.—231 Race St., Philadelphia, Pa.
Hub Foundry & Plating Co., Inc.—Ossining, N. Y.
Humphreys Mfg. Co.—201 E. 5th St., Mansfield, Ohio.
Indiana Brass & Bronze Co.—Marion, Ind.
Jefferson Brass Foundry.—209 King St., Brooklyn, N. Y.
Keystone Brass Foundry Co.—188 Berks St., Philadelphia, Pa.
Kokomo Brass Works.—351 N. Smith St., Kokomo, Ind.
Langsenkamp-Wheeler Co.—Indianapolis, Ind.
Lee Mfg. Co., The.—Conners St., Port Huron, Mich.
Liberty Brass Foundry.—1095 Niagara St., Buffalo, N. Y.
Light Mfg. & Foundry Co.—509 Queen St., Pottstown, Pa.
Lumen Bearing Co.—Sycamore St. & Belt Line, Buffalo, N. Y.
Manhattan Brass Co.—332 E. 28th St., New York City.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Moore Co., Franklin.—Winsted, Conn.
New Jersey Aluminum Co.—19th & Springfield Aves., Newark, N. J.
Niagara Falls Brass Works, Inc.—146 Virginia St., Buffalo, N. Y.
Nolte Brass Co.—Springfield, Ohio.
Non-Corrosive Metal Co., Inc.—Watertown, Conn.
Noonan Tool & Machine Works.—Rome, N. Y.
Norwalk Brass Co.—Norwalk, Conn.
Oberdofer Brass Co., M. L.—804 E. Water St., Syracuse, N. Y.
Ohio Brass Co.—Mansfield, Ohio.
Parker, Surry.—Pinetown, N. C.
Phosphor Bronze Smelting Co.—2200 Washington Ave., Philadelphia, Pa.
Pioneer Brass Works.—418-424 S. Penna St., Indianapolis, Ind.
Pittsburg Brass Mfg. Co.—3153 Penn Ave., Pittsburg, Pa.
undry.—Amesbury, Mass.
ss & Brass Foundry & Machine
vidence, R. I.
ss & Iron Co.—Racine, Wis.
Son, Paul S.—1415 Catherine
adelphia, Pa.
Sons & Co., J.—Holliday &
atoga Sts., Baltimore, Md.
& Co., J. J.—68-74 W. Monroe St.,
icago, Ill.
ood Brass Works.—1167 Jefferson
., Detroit, Mich.

CASTINGS — ALUMINUM, BRASS, BRONZE AND COPPER (Cont.)

Sherwood Mfg. Co.—Elmwood Ave. & Belt Line, Buffalo, N. Y.
Spence Mfg. Co.—279 Park St., Milwaukee, Wis.
Spencer's Sons, I. S.—Guilford, Conn.
Standard Foundry Co.—Hartford, Conn.
Stover Mfg. Co.—Freeport, Ill.
Syracuse Aluminum & Bronze Co.—530 Leavenworth Ave., Syracuse, N. Y.
Troutt, H. G., King Iron Works.—226 Ohio St., Buffalo, N. Y.
Turner Brass Works, The.—72 Michigan St., Chicago, Ill.
Unique Metal Co.—25 Illinois St., Buffalo, N. Y.
United States Aluminum Castings Co.—Hamilton & Vandalia Aves., Cincinnati, Ohio.
United States Aluminum Co.—Pittsburg, Pa.
United States Bronze Co.—149 Columbus St., Cleveland, Ohio.
Vincent Valve Co., The.—Sandusky, Ohio.
Waltham Brass & Aluminum Co.—Waltham, Mass.
Western Brass Mfg. Co.—21st & Rockwell Sts., Chicago, Ill.
Wetherill Finished Castings Co.—Office, 12th and Cumberland Sts.; factory, Richmond St. and Erie Ave., Philadelphia, Pa.
Williams Valve Co., D. T.—904-910 Broadway, Cincinnati, Ohio.
Williams & Son, E. A.—107 Plymouth St., Jersey City, N. J.
Worcester Pressed Steel Co.—North & Barber Aves., Worcester, Mass.
Zero Valve & Brass Mfg. Co.—419 Chicago St., Buffalo, N. Y.

CASTINGS—GRAY IRON

Acme Foundry Co.—Sweeney St., Cleveland, Ohio.
American Foundry & Mfg. Co.—Herbert & Wright Sts., St. Louis, Mo.
Atlas Foundry Co.—801 S. Washington St., Peoria, Ill.
Barcus & Co., Geo.—Wabash, Ind.
Barlow Foundry Co., The.—28 Orange St., Newark, N. J.
Belle City Mfg. Co.—Racine Junction, Wis.
Blake, Edwin J.—565 Winslow St., Hartford, Conn.
Bridgeport, Malleable Iron Co.—Bridgeport, Conn.
Buffalo Foundry Co.—Buffalo, N. Y.
Capitol Foundry Co.—Hartford, Conn.
Cascade Foundry Co.—19th & Plum Sts., Erie, Pa.
Chicago Hardware Foundry Co.—North Chicago, Ill.
Cramp & Sons Ship & Engine Building Co.—Philadelphia, Pa.

CASTINGS—GRAY IRON (Continued)

Detroit Stoker & Foundry Co.—N. Grand Blvd. & Riopelle St., Detroit, Mich.
Domestic Sewing Machine Co.—Warren & High Sts., Newark, N. J.
Emmert Mfg. Co.—Waynesboro, Pa.
Enterprise Foundry Co.—Detroit, Mich.
Erie Foundry Co.—Erie, Pa.
Ferro Machine & Foundry Co.—115 Wade Bldg., Cleveland, Ohio.
Franklin Moore Co.—Winsted, Conn.
Globe Malleable Iron Co.—Greenway Ave., Syracuse, N. Y.
Gray-Hawley Mfg. Co.—605-609 W. Fort St., Detroit, Mich.
Grey Iron Castings Co.—Mt. Joy, Pa.
Hayes Foundry Co.—Lynn, Mass.
Heindel Mfg. Co.—Hanover, Pa.
Hildreth Motor & Pump Co., The.—Lansing, Mich.
Holbrook Armstrong Iron Co.—Racine, Wis.
Hopson & Chapin Mfg. Co.—New London, Conn.
Houle Motor Works, A. J.—Holyoke, Mass.
Indianapolis Foundry Co.—Indianapolis, Ind.
Inter State Foundry Co.—Cleveland, O.
Janney, Steinmetz & Co.—4th & Market Sts., Philadelphia, Pa.
Johnson & Co., Isaac G.—Spuyten-Duyvil, New York City.
Konigslow Mfg. Co., Otto.—2279 Clarkwood Road, Cleveland, Ohio.
Manufacturers Foundry Co.—Waterbury, Conn.
Massey Machine Co.—Pearl St., Watertown, N. Y.
Meeker Foundry Co.—95 Clay St., Newark, N. J.
Mesta Machine Co.—Pittsburg, Pa.
Minnesota Malleable Iron Co.—St. Paul, Minn.
Moline Malleable Iron Co.—St. Charles, Ill.
Naugatuck Malleable Iron Co.—Naugatuck, Conn.
Nortmann-Duffke Foundry Co.—26th St. & Layton Ave., Milwaukee, Wis.
Norway Iron & Steel Co.—York, Pa.
Oshkosh Malleable Iron Co.—Oshkosh, Wis.
Pacific Iron Works, Inc.—Bridgeport, Conn.
Palmer & De Mooy Foundry Co.—Cleveland, Ohio.
Parker, Surrey.—Pinetown, N. C.
Parkhurst Mfg. Co.—Peru, Ind.
Philadelphia Stove & Iron Foundry Co.—1631 N. 5th St., Philadelphia, Pa.
Port Huron Engine & Thresher Co.—Port Huron, Mich.
Racine Brass & Iron Co.—Racine, Wis.
Racine Malleable & Wrought Iron Co.—Racine, Wis.

CASTINGS—GRAY IRON (Continued)

Rhode Island Malleable Iron Works.—Hills Grove, R. I.
Sintz-Wallin Co., The.—285 S. Front St., Grand Rapids, Mich.
Sessions Foundry Co.—Bristol, Conn.
South Side Steel & Malleable Casting Co.—Windlake & 14th Aves., Milwaukee, Wis.
Spencer's Sons, I. S.—Guilford, Conn.
Standard Foundry & Mfg. Co.—Cleveland, Ohio.
Standard Foundry Co.—Jersey St. & Lakeview Ave., Buffalo, N. Y.
Standard Metalwork Co.—Thompsonville, Conn.
Stover Mfg. Co.—Freeport, Ill.
Stowell Mfg. & Foundry Co.—South Milwaukee, Wis.
Syracuse Malleable Iron Works.—Syracuse, N. Y.
Tarrant Foundry Co.—Chicago, Ill.
Three Rivers Furnace & Foundry Co.—Three Rivers, Mich.
Utica Steam Engine & Boiler Works.—Utica, N. Y.
Utica Foundry Co.—Utica, N. Y.
Western Malleable Steel Co.—1250 River St., Detroit, Mich.
Western Motor Co.—Logansport, Ind.
Wilcox, Crittenden & Co.—Middletown, Conn.
Wilmington Malleable Iron Co.—Wilmington, Del.
Worcester Pressed Steel Co.—North & Barber Aves., Worcester, Mass.

CASTINGS—MALLEABLE IRON

Acme Steel & Malleable Iron Works.—Military Road, Buffalo, N. Y.
Arcade Malleable Iron Co.—Worcester, Mass.
Barlow Foundry Co., The.—28 Orange St., Newark, N. J.
Beaver Dam Malleable Iron Co.—Beaver Dam, Wis.
Breeze Carbureter Co. of New York.—101 W. 66th St., New York City.
Bridgeport Malleable Iron Co.—Bridgeport, Conn.
Buhl Malleable Iron Co.—Detroit, Mich.
Clayton & Lambert Mfg. Co.—Detroit, Mich.
Columbus Malleable Iron Co.—Columbus, Ohio.
Dayton Malleable Iron Co.—Day
Flagg & Co., Stanley G.—Phila.
Pa.
Frazer & Jones Co.—Syracuse, N.
Illinois Malleable Iron Co.—Chicago
Malleable Iron Fitting Co.—B---
Conn.
Pacific Iron Works, Inc.—Bri
Conn.
Williams & Son, E. A.—107 Plyr
St., Jersey City, N. J.

CASTINGS—STEEL

A. & J. Mfg. Co.—26 W. Randolph St., Chicago, Ill.
Acme Steel & Malleable Iron Works.—Military Road, Buffalo, N. Y.
Adrian Steel Casting Co.—Beecher St., Adrian, Mich.
American Steel Castings Co.—Chester, Pa.
Arcade Malleable Iron Co.—Worcester, Mass.
Atha Steel Co.—Newark, N. J.
Bethlehem Steel Co.—South Bethlehem, Pa.
Buffalo Crucible Casting Co.—25 Washington St., Buffalo, N. Y.
Crucible Steel Castings Co.—Lansdowne, Pa.
Crucible Steel Castings Co.—Milwaukee, Wis.
Dutcher Co., J. A. & P. E.—Milwaukee, Wis.
Flagg & Co., Stanly G.—Philadelphia, Pa.
Frazer & Jones Co.—Syracuse, N. Y.
Imperial Steel Co., The.—218 Front St., Fremont, Ohio.
Johnson & Co., Isaac G.—Spuyten Duyvil, N. Y.
Johnston, Geo. H.—Sparrow Point, Md.
Logan Mfg. Co.—Phoenixville, Pa.
Mackintosh, Hemphill & Co.—Pittsburg, Pa.
Malleable Iron Fittings Co.—Branford, Conn.
Massachusetts Steel Casting Co.—West Everett, Mass.
Mesta Machine Co.—Pittsburg, Pa.
Michigan Crucible Steel Castings Co.—Guion St., Detroit, Mich.
Milwaukee Steel Foundry Co.—Milwaukee, Wis.
National Brake & Clutch Co.—16 State St., Boston, Mass.
Newark Iron & Steel Co.—Newark, Ohio.
New England Steel Castings Co.—Hyde Park, Mass.
New Jersey Steel Co.—Rahway, N. J.
New Process Steel Co., The.—Marshall, Mich.
Nortmann-Duffke Foundry Co.—26th St., & Layton Ave., Milwaukee, Wis.
Norway Iron & Steel Co.—York, Pa.
Otis Steel Co.—Cleveland, Ohio.
Providence Steel Castings Co.—164 ns Ave., Providence, R. I.
Mfg. Co.—Kalamazoo, Mich.
Steel Foundry Co., E. G.—31-39 Buffalo, N. Y.
Steel Casting Co.—451-473 Newark, N. J.
Steel Castings Co., Geo. H.—500 Iron St., Milwaukee, Wis.
Iron & Steel Co.—Highbridge, New York City.

CASTINGS—STEEL (Continued)

Tobin-Gerlinger Steel Castings Co.—West Allis, Wis.
Tool Steel Castings Co.—90 Canal St., Boston, Mass.
Western Malleable Steel Co.—1250 River St., Detroit, Mich.
Whiteley Steel Co.—Muncie, Ind.
Wilmarth & Morman Co.—585 Canal St., Grand Rapids, Mich.
Worcester Steel Foundry Co.—Millbury, Mass.

CELLULOID

Arlington Co., The.—473-475 Broadway, New York City.
Landers Bros. Co.—445 10th St., Toledo, Ohio.

CEMENT—TIRE

Automobile Equipment Co.—264 Jefferson Ave., Detroit, Mich.
Automobile Supply Mfg. Co.—139-147 Emerson Place, Brooklyn, N. Y.
Brooklyn Rubber Co.—397 Summer Ave., Brooklyn, N. Y.
Buffalo Rubber Mfg. Co.—Sussex Ave. & Erie R. R., Buffalo, N. Y.
Buffalo Specialty Co.—3751-77 Elliott Sq., Buffalo, N. Y.
Hosmer Co., G. A.—601-607 Northland Ave., Buffalo, N. Y.
Longhurst, Jas. S., Jr.—Walnut St., Lynbrook, N. Y.
Lyon Rubber Co.—Akron, Ohio.
Magnet Cement & Dressing Co.—878 N. 48th St., Philadelphia, Pa.
M. & M. Mfg. Co.—Akron, Ohio.
Martin Evans Co.—1186 Bedford Ave., Brooklyn, N. Y.
Morgan & Wright.—Detroit, Mich.
National Cement & Rubber Mfg. Co.—3053-59 Monroe St., Toledo, Ohio.
Rea Bros. & Co.—202 Nicollet Ave., Minneapolis, Minn.
Republic Rubber Co., The.—Youngstown, Ohio.
Tingley & Co., Chas. O.—Rahway, N. J.
Trenton Rubber Mfg. Co.—Trenton, N. J.
Young, Orlando W.—180 Freylinghysen Ave., Newark, N. J.

CHAINS

Aktiengesellschaft vorm. J. Mehlich.—Sophienstrasse 21, Berlin, Germany.
Appelby, Jos., Ltd.—Birmingham, England.
Baldwin Chain & Mfg. Co.—199 Chandler St., Worcester, Mass.
Birmingham Small Arms & Metal Co.—Birmingham, England.
Brampton Bros., Ltd.—Calais, France.
Brampton Bros., Ltd.—Oliver St., Chester St., Birmingham, England.

CHAINS (Continued)

Conte, J.—38 rue des Panoyaux, Paris, France.
Coventry Chain Co., Ltd.—Coventry, England.
Cullman Wheel Co.—1030 Dunning St., Chicago, Ill.
Darbilly et Cie., H.—12 rue Vincent, Paris, France.
Diamond Chain & Mfg. Co.—231 W. Georgia St., Indianapolis, Ind.
Duckworth Chain & Mfg. Co.—Springfield, Mass.
Eadie Chain Co., Ltd.—Redditch, England.
Empire Mfg. Co., Ltd.—Birmingham, England.
Enders, August.—Oberhamed, bei Ludenscherd, Westphalia, Germany.
Gauthier et Trentelivres.—30 rue de Malines, Brussels, Belgium.
Hans Renold.—Brook St., Manchester, England.
Lawley, Thos.—60 Kenyon St., Birmingham, England.
Lefevre Arms Co.—Syracuse, N. Y.
Leng's Son & Co., John S.—33 Murray St., New York City.
Link Belt Co.—Chicago, Ill.
Link Belt Engineering Co.—Nictown, Pa.
Maytenecht, August.—Schwerte, Germany.
Morgan Chain & Pedal Co., Ltd.—Floodgate St., Birmingham, England.
Morse Chain Co.—Trumansburg, N. Y.
Peugeot Frères.—296 Broadway, New York City.
Peugeot Frères, les fils de.—Valentigney, Doubs, France.
Rafer fils Frères.—St. Chamond, Loire, France.
Roger, Durand.—99 bvd. Beaumarchais, Paris, France.
Société la Française.—11 rue Brunel, Paris, France.
Sorge und Sabeck.—Mauerstrasse 86, Berlin, Germany.
Westinghouse Electric Co., Ltd.—4 rue Auber, Paris, France.
Whitney Mfg. Co., The.—Hartford, Conn.
Wuppermann, Wilhelm.—Hagen, Germany.

CHAINS—TIRE

Auto Specialty Co.—6 E. Madison St., Chicago, Ill.
Defiance Chain Co., The.—143 Federal St., Boston, Mass.
Gaylord Co., F. L.—Ansonia, Conn.
Johnson Sporting Goods Co., Iver.—163-165 Washington St., Boston, Mass.
Leng's Son & Co., John S.—33 Murray St., New York City.
Model Mfg. Co., The.—15 Frankfort St., New York City.

CHAINS—TIRE (Continued)

Sager Co., J. H.—Rochester, N. Y.
Slama Tire Protector Co.—Humboldt, Neb.
Weed Chain Tire Grip Co.—28 Moore St., New York City.
Wells Light Mfg. Co., The.—44-46 Washington St., New York City.
Willyoung Appliance Co.—Ludlow Station, Yonkers, N. Y.

CHANNELS

American Tube & Stamping Co.—Bridgeport, Conn.
Garford Co., The.—Elyria, Ohio.
Weston-Mott Co.—Flint, Mich.
 (See also Iron and Steel, angle and channel.)

CHASSIS—COMPLETE

Bendix Co., The.—2107 N. 9th St., Chicago, Ill.
Borbein Auto Co.—2109-11 N. 9th St., St. Louis, Mo.
Garford Co., The.—Elyria, Ohio.

CLOCKS—AUTOMOBILE

American Electrical Novelty & Mfg. Co.—308 Hudson St., New York City.
Chelsea Clock Co.—16 State St., Boston, Mass.
Chicago Electric Mfg. Co.—435 N. Broad St., Philadelphia, Pa.
Jones Speedometer Co.—Broadway at 76th St., New York City.
Manassch, Levy.—182 Broadway, New York City.
Newman Clock Co.—Masonic Temple, Chicago, Ill.
Wilson Automatic Clock Co.—935 Arch St., Philadelphia, Pa.

CLOTH—RUBBER

Carr, F. S.—74 Pearl St., Boston, Mass.
Commonwealth Rubber Co.—Reading, pa., and 1001 Flatiron Bldg., New York City.
Empire Rubber Mfg. Co.—Trenton, N. J.
Fairfield Rubber Co.—Fairfield, Conn.
Landers Bros. Co.—445 10th St., Toledo, Ohio.
Manufacturers Selling Co.—1777 Broadway, New York City.
Mutty Co., L. J.—28 Summer St., Boston, Mass.
Western Rubber Co.

**CLOTHING, see
PA**

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Auto-teile Gesellsch.
 many.
Bozier.—7 rue Deni
 France.

CLUTCHES (Continued)

Brownell Motor Co., F. A.—634-6 Lexington Ave., Rochester, N. Y.
Carlyle-Johnson Machine Co., The.—356 Asylum St., Hartford, Conn.
Coindet, A.—137 ave Gambetta, Paris, France.
Continental Motor Mfg. Co.—Muskegon, Mich.
Cross Engine Co., M. O.—800-806 Bellevue Ave., Detroit, Mich.
Double-Friction Coil Clutch Co.—45 Canal St., Chicago, Ill.
Dupoirer, H.—48 rue Claude-Decaren, Paris, France.
Fort Wayne Gear Co.—North American Building, Fort Wayne, Ind.
Garford Co., The.—Elyria, Ohio.
General Mfg. Co.—Elkhart, Ind.
Grißson und Co.—Hamburg, Germany.
Hatcher Auto Parts Co.—2108 Superior Ave., Cleveland, Ohio.
Hayden Co., N. L.—Columbus, Ohio.
Hele-Shaw Patent Clutch Co., Ltd.—36 Chatham St., Liverpool, England.
James & Brown, Ltd.—395 Oxford St., London, W., England.
Julien, J.—110 rue St. Maur, Paris, France.
Kirkham Motor Mfg. Co.—Bath, N. Y.
Lejeune, Marcel.—93 rue d'Angoulême, Paris, France.
Long Arm System Co.—Lakeside Ave. & E. 38th St., Cleveland, Ohio.
Maschinenbau Actiengesellschaft.—Leipzig, Germany.
Merchant & Evans Co.—517 Arch St., Philadelphia, Pa.
Monier et Martin.—63 bvd. de la République, Nîmes, France.
Muncie Auto Parts Co.—Elliott St. & L. E. W. Yards, Muncie, Ind.
National Brake & Clutch Co.—16 State St., Boston, Mass.
National Brake & Electric Co.—Milwaukee, Wis.
North Chicago Machine Co.—North Chicago, Ill.
Northway Motor & Mfg. Co.—Grand Ave., Detroit, Mich.
Parant Frères.—59 rue Chauveau, Paris, France.
Powell & Young.—52 W. 43rd St., New York City.
Reeves Pulley Co.—1225 7th St., Columbus, Ind.
Speed Changing Pulley Co.—750 E. Washington St., Indianapolis, Ind.
Standard Brake Co., The.—101 W. 66th St., New York City.
Sturtevant Mill Co.—Harrison Sq., Boston, Mass.
Tolch and Co.—Fulham, London, England.
Universal Clutch Co.—226 S. 11th St., Philadelphia, Pa.

CLUTCHES (Continued)

Verstraete Mfg. Co., Ed.—421 Clinton St., Milwaukee, Wis.
Warner Clutch Co.—1461 Michigan Ave., Chicago, Ill.
Waukesha Motor Co.—110 North St., Waukesha, Wis.
Wyss et Cie.—Seloncourt, Doubs, France.

COATS, see WEARING APPAREL,
COATS AND WEARING AP-
PAREL, FUR COATS

COCKS

Ashton Valve Co.—271 Franklin St., Boston, Mass.
Boston Steam Specialty Co.—168-70 Congress St., Boston, Mass.
Eaton, Cole & Burnham Co., The.—Bridgeport, Conn.
Imperial Brass Mfg. Co.—245-47 S. Jefferson St., Chicago, Ill.
Lunkenheimer Co., The.—Cincinnati, O.
 (See also Fittings, Pipe.)

COILS—SPARK

American Coil Co., Inc.—Cor. Wall & Cocasset Sts., Foxboro, Mass.
American Machine Mfg. Co.—41 Lewis Wharf, Boston, Mass.
Ateliers H. Leclerc, Société Anonyme.—33 quai St. Leonard, Liege, Belgium.
Autocoil Co., The.—132 7th St., Jersey City, N. J.
Auto Specialty Co.—6 E. Madison St., Chicago, Ill.
Bac et Henry.—10 rue Cavé, Levallois, Seine, France.
Blum, E.—130 ave d'Orleans, Paris, France.
Brunet-Loiseau Frères.—13 rue des Francs-Bourgeois, Paris, France.
Carpentier, J.—20 rue Delambre, Paris, France.
Champion Co., Albert.—541 Tremont St., Boston, Mass.
Connecticut Telephone & Electric Co., Inc.—70 Britannia St., Meriden, Conn.
Dayton Electrical Mfg. Co.—87 St. Clair St., Dayton, Ohio.
Dow Portable Electric Co.—Braintree, Mass.
Duplex Coil Co.—Fond-du-Lac, Wis.
Elbridge Electric Co.—Elbridge, N. Y.
Electric Contract Co.—202 Centre St., New York City.
Electric Ignition Co.—Sparkbrook, Birmingham, England.
Fabrik Electrischerapparate, Dr. Max Levy.—Chausseestrasse 2, Berlin, Germany.
Fischer Special Mfg. Co.—2076 Reading Road, Cincinnati, Ohio.
Foresti Terzo.—4 via Chiaravalle, Milan, Italy.

COILS—SPARK (Continued)

Fuller & Son, John C.—Woodland Works, Wick Lane, Bow, London, England.
Gauthier et Trentelivres.—30 rue de Malines, Brussels, Belgium.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
Gianoli, Louis.—26 bvd. Magenta, Paris, France.
Godet, Edward.—12 ave d'Orleans, Paris, France.
Guenet, J.—5 rue Montmorency, Paris, France.
Hardy Co., R. E.—86 Watts St., New York City.
Heininger, Max.—29 Coulouvremière, Geneva, Switzerland.
Heinze Electric Co.—Lowell, Mass.
Herz & Co.—203-205 Lafayette, St., New York City.
Hoffman und Co.—Neue Koenigsthasse 49, Potsdam, Germany.
Holcombe & Co.—45 Vesey St., New York City.
Invicta, Société.—5 rue Déves, Neuilly-sur-Seine, France.
Klaas und Sachtleben.—Magdeburg, Germany.
Knoblock-Heideman Mfg. Co.—South Bend, Ind.
Kokomo Electric Co.—339 Smith St., Kokomo, Ind.
Lacoste et Cie.—28 bvd. de Strasbourg, Paris, France.
Marconi Wireless Telegraph Co.—18 Finch Lane, London, E. C., England.
McKibbin Mfg. Co.—South Norwalk, Conn.
Muller und Lohse.—Blumenstrasse 14, Leipzig-Gohlis, Germany.
National Coil Co.—Lansing, Mich.
Never Miss Spark Plug Co.—321-323 Michigan Ave., E., Lansing, Mich.
New York Coil Co.—338-40 Pearl St., New York City.
Nilmelior, Société d'Electricité.—47 rue Lacordaire, Paris, France.
Noxon, C. Per Lee.—500 E. Water St., Syracuse, N. Y.
Ohio Electric Works.—6304 Ellen Ave., N. W., Cleveland, Ohio.
Onland van de Kastele.—Utrecht, Holland.
Oshkosh Malleable Iron Co.—Oshkosh, Wis.
Perez et Cie.—50 rue Paradis, Paris, France.
Peto and Radford, Ltd.—Ashtead, Surrey, England.
Pfanstiehl Electrical Laboratory.—North Chicago, Ill.
Pittsfield Spark Coil Co.—Dalton, Mass.
Prested Miners Gas Indicating Electric Lamp Co., Ltd.—Albert Works, Elthorne Road, Holloway, London, N., England.

COILS—SPARK (Continued)

Queen & Co., Inc.—8th & Arch Sts., Philadelphia, Pa.
Rapid Accumulatoren und Motorwerke.—Hauptstrasse 140, Berlin-Schöneberg, Germany.
Remy Electric Co.—Anderson, Ind.
Robert Instrument Co., The.—56 Shelby St., Detroit, Mich.
Roche, William.—40 W. Broadway, New York City.
Ropiquet, Cl.—214 rue Jules-Barni, Amiens, France.
Ruprecht Electrical Co.—769 Cedar Ave., Cleveland, Ohio.
Schug Electric Co., The.—326 Jefferson Ave., Detroit, Mich.
Seidler-Miner Electric Co.—207 Jefferson Ave., Detroit, Mich.
Sherman-Lemke Coil & Supply Co.—106 Wisconsin St., Milwaukee, Wis.
Siemens und Halske.—Markgrafenstrasse 94, Berlin, Germany.
Siersaack, G.—95 bvd. du Hainaut, Brussels, Belgium.
Splitdorf, Chas. F.—261-65 Walton Ave., New York City.
Sterling Alternating Ignition Co.—184 Water St., Binghamton, N. Y.
Thordasen Electric Co.—153 S. Jefferson St., Chicago, Ill.
Tritt Electric Co.—301 Division St., Union City, Ind.
United Motor Industries, Ltd.—Sherbourne Works, Coventry, England.
United States Coil Co.—Jersey City, N. J.
Usine Fulminator.—Saventhem, Belgium.
Western Electric Co.—259 S. Clinton St., Chicago, Ill.
Williams, E. Q.—533 S. Clinton St., Syracuse, N. Y.
Willyoung Appliance Co.—Ludlow Station, Yonkers, N. Y.
Witherbee Igniter Co.—541 W. 43rd St., New York City.
Witherbee Mfg. Co., Inc.—433 W. 42nd St., New York City.

COMPRESSORS—AIR

American Steam Pump Co.—Battle Creek, Mich.
Chicago Pneumatic Tool Co.—1010 Fisher Bldg., Chicago, Ill.
Comptoir d'Innovations Pour Automobiles.—16 ave de la Grand Aim France. United States Bldg Broadway, New York City.
Eureka Pneumatic Spray Co.—9 ette Ave., New York City.
Ferodowill Mfg. Co.—St. Paul, Minn.
Fulmer, C. F.—Plainfield, N. J.
Gilmer, Crowell.—292-96 Brooklyn, N. Y.
Ingersoll-Rand Co.—111 Br... York City.

COMPRESSORS—AIR (Continued)

Jacobson Machine Mfg. Co.—Warren, Pa.
Kalisch Air Brake Co.—1317 Chestnut St., St. Louis, Mo.
Leather & Brass Mfg. Co.—24-26 E. Genesee St., Auburn, N. Y.
Martin & Anson Co.—226 Indiana Ave., Chicago, Ill.
Mietz, A.—133 Mott St., New York City.
New Era Gas Engine Co.—9 Dale Ave., Dayton, Ohio.
Spacke Machine Co., The F. W. S.—Indianapolis, Ind.
Victor Electric Co.—55-61 Market St., Chicago, Ill.
Westinghouse Air Brake Co.—Pittsburg, Pa.

COMPOUND—BRAZING

A. & J. Mfg. Co.—26 W. Randolph St., Chicago, Ill.
Cast Iron Brazing & Mfg. Co.—Manchester, N. H.
Cortland Specialty Co.—176 Railroad St., Cortland, N. Y.
Dixon Crucible Co., Jos.—Jersey City, N. J.
Krembs & Co.—50 Waldo Place, Chicago, Ill.
Standard Brazing Co.—88 Broad St., Boston, Mass.
Standard Lamp Mfg. Co.—43 S. Canal St., Chicago, Ill., and Charlotte, Mich.
Waterbury Brass Co.—Waterbury, Conn.

COMPOUND—GRINDING

Clover Mfg. Co.—228 W. 58th St., New York City.

COMPOUND—NON-FREEZING

Alger Laboratories.—Providence, R. I.
Auto Chemical & Mfg. Co.—1770 Broadway, New York City.
Beringer, Geo N.—5th & Federal Sts., Camden, N. J.
Carbondale Chemical Co.—Carbondale, Pa.
Kalbfeisch Co., Franklin H.—Broadway & 16th St., New York City.
Marx & Rawolle.—98 William St., New York City.
Orlando W.—180 Freylinghuy-J.

—STEAM

Ham Pump Co.—356 Arborway, Taicapa Plain, Mass.
Turney Mfg. Co.—Rome, N. Y.
Oil Burner & Equipment Co.—Illand Bldg., St. Louis, Mo.
er & Co., E. C.—1913-23 Logan St., Louisville, Ky.

CONES

Boston Pressed Metal Co.—171-173 Union St., Worcester, Mass.
Cassady Fairbanks Mfg. Co.—6106-30 La Salle St., Chicago, Ill.
Chicago Screw Co.—2 N. Canal St., Chicago, Ill.
Corbin Screw Corp., The.—New Britain, Conn.
Crosby Co.—Buffalo, N. Y.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Houghton & Buxton.—Worcester, Mass.
Matthews Mfg. Co., H. A.—Seymore, Conn.
National Cycle Mfg. Co.—Bay City, Mich.
Peninsular Milled Screw Co.—751 Bellvue Ave., Detroit, Mich.
Sartus Ball Bearing Co.—155 Spring St., New York City.
Star Ball Retainer Co.—Lancaster, Pa.
Worcester Pressed Steel Co.—North & Barber Aves., Worcester, Mass.

CONTACTS—PLUG & COIL, PLATINUM

American Platinum Works.—251 N. J. R. R. Av., Newark, N. J.
Baker & Co., Inc.—408-14 N. J. R. R. Ave., Newark, N. J.
Boker & Co., Herman.—101 Duane St., New York City.
Croselmire & Ackor Co.—42 Walnut St., Newark, N. J.
Idium Metals Co.—Boston, Mass.
Queen & Co., Inc.—8th & Arch Sts., Philadelphia, Pa.

CONTROLLERS—ELECTRIC

Cutler-Hammer Electric Co.—Milwaukee, Wis.
Electric Controller & Supply Co.—Cleveland, Ohio.
Electric Vehicle Equipment Co.—20th St. & Montgomery Ave., Philadelphia, Pa.
Elwell Parker Electric Co.—1076 Hamilton St., Cleveland, Ohio.
General Electric Co.—44 Broad St., New York City.
Lamb & Co.—Kent & Lyons Sts., Grand Rapids, Mich.
Lincoln Electric Co.—Cleveland, Ohio.
Schug Electric Co., The.—326 Jefferson Ave., Detroit, Mich.
Westinghouse Electric Mfg. Co.—Pittsburg, Pa.

COOLERS, see RADIATORS

COPPER CASTINGS, see CASTINGS, ALUMINUM, BRASS, BRONZE AND COPPER

COPPER—SHEET & ROD

Ansonia Brass & Copper Co.—99 John St., New York City.
 Besley & Co., C. H.—15-21 S. Clinton St., Chicago, Ill.
 Bridgeport Brass Co.—Bridgeport, Conn.
 Chicago Brass Co.—Kenosha, Wis.
 Coe Brass Mfg. Co.—Torrington, Conn.
 Detroit Copper & Brass Rolling Mills.—Detroit, Mich.
 Goodwin & Kintz Co.—20 Ranley St., Winsted, Conn.
 Hendricks Bros.—49 Cliff St., New York City.
 Hungerford Brass & Copper Co.—Pearl and Park Sts., New York City.
 Hussey & Co., C. G.—Pittsburg, Pa.
 Manhattan Brass Co.—332 E. 28th St., New York City.
 New Haven Copper Co.—New Haven, Conn.
 Plume & Atwood Mfg. Co.—Waterbury, Conn.
 Randolph-Clowes Co.—Waterbury, Conn.
 Rome Brass & Copper Co.—Rome, N. Y.
 Seymour Mfg. Co.—Seymour, Conn.
 Scoville Mfg. Co.—Waterbury, Conn.
 Taunton-New Bedford Copper Co.—Taunton, Mass.
 United States Indestructible Gasket Co.—16 S. William St., New York City.
 Waterbury Brass Co.—Waterbury, Conn.

COUPLINGS—HOSE

Doyle Hose Union Co.—810 Ann St., Homestead, Pa.
 Ingersoll-Rand Co.—11 Broadway, New York City.
 Morgan, B.—Old Beach Road, Newport, R. I.
 New Jersey Car Spring & Rubber Co.—Wayne & Brunswick Sts., Jersey City, N. J.
 Pittsburg Machine Co., The.—New Brighton, Pa.

COUPLINGS—PIPE

Breeze Carbureter Co. of New York.—101 W. 66th St., New York City.
 Cumberland Steel Co.—Williams St. & B. O. R. R., Cumberland, Md.
 Fries & Co.—89-93 Main St., Buffalo, N. Y.
 Hatcher Auto Parts Co.—Cleveland, Ohio.
 Pedersen Mfg. Co.—400-412 E. 37th St., New York City.
 Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, Ohio.
 Youse, E. S.—46 N. 5th St., Reading, Pa.

COVERS—AUTOMOBILE

Abercrombie & Fitch.—57 Reade St., New York City.
 American Karbel Co.—Jonesboro, Ark.

COVERS—AUTOMOBILE
 (Continued)

Bridgeport Vehicle Co.—Water & South Ave., Bridgeport, Conn.
 Burgin Bros.—Springfield, Mass.
 Channon & Co., H.—Market & Randolph Sts., Chicago, Ill.
 Empire Gear & Top Co.—413 N. 22nd St., Philadelphia, Pa.
 Gilbert Mfg. Co.—New Haven, Conn.
 Holcombe, H. C.—105 Goffe St., New Haven, Conn.
 Hume Carriage Co.—Amesbury, Mass.
 Landers Bros. Co.—445 10th St., Toledo, Ohio.
 Manhattan Auto Top and Body Co.—249 W. 64th St., New York City.
 Mutty Co., L. J.—28 Summer St., Boston, Mass.
 Nathan Novelty Mfg. Co.—88 Reade St., New York City.
 Paris Auto Top Co.—236 W. 41st St., New York City.
 Vehicle Apron & Hood Co.—Columbus, Ohio.
 Wiley & Son Co., Wm. H.—Hartford, Conn.
 Wood & Son, Frederick R.—219 W. 19th St., New York City.

COVERS—LAMP

Allen Auto Specialty Co.—1931 Broadway, New York City.
 Bridgeport Vehicle Co.—Water & South Ave., Bridgeport, Conn.
 Empire Rubber Co.—115-117 Worth St., New York City.
 Fickling & Co., Inc.—154 E. 57th St., New York City.
 Gifford & Son, John A.—25 Park Pl., New York City.
 Harper Co., Walter J.—229-231 Mulberry St., Newark, N. J.
 Hopewell Bros.—42 Osborn St., Cambridge, Mass.
 Moore Co., Inc., Geo. P.—721 Golden Gate Ave., San Francisco, Cal.; 1005 S. Main St., Los Angeles, Cal.; 231 Twelfth St., Oakland, Cal.; 332 Broadway, New York City.
 Nathan Novelty Mfg. Co.—88 Reade St., New York City.
 New York Motor Fabric Co.—32 Union Sq., New York City
 Vehicle Apron & Hood Co.—Ohio.
 Vehicle Top & Supply Co.—St. Louis, Mo.
 Wiley & Son Co., Wm. I.—Conn.

COVERS—OIL-HOOD

Bowen Mfg. Co.—Canal St., N. Y.

COVERS—SLIP

Anderson & Co., F. W.—429 S. Broad St.; factory, 757 N. Uber St., Philadelphia, Pa.
Bridgeport Vehicle Co.—South & Water St., Bridgeport, Conn.
Crescent Auto Top Co.—58 W. 43rd St., New York City.
Demar Co., J. E.—244-48 W. 49th St., New York City.
Duane & Co., W. J.—304 W. 54th St., New York City.
Dunham & Son, D. B.—Rahway, N. J.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Hopewell Bros.—42 Osborn St., Cambridge, Mass.
National Auto Top Co.—Main Office, 1904 Broadway; Factory, 244-50 W. 49th St., New York City.
New England Auto Top Co.—229 W. 54th St., New York City.
Schubert Bros. Gear Co.—42-44 Cedar St., Oneida, N. Y.
Victor Factories.—Broadway & 65th St., New York City.

CRANES—PORTABLE

Franklin Portable Crane & Hoist Co.—Franklin, Pa.
Nichols, Wm. S.—253 Broadway, New York City.
Niles-Bement-Pond Co.—111 Broadway, New York City.

CRUCIBLES

Bridgeport Crucible Co.—Bridgeport, Conn.
Obermayer Co., S.—641 Evans St., Cincinnati, Ohio.
Wisconsin Graphite Co.—Allegheny, Pa.

CUPS, BALL, see CONES

CUP—OIL

American Injector Co.—Detroit, Mich.
American Lubricator Co.—Detroit, Mich.
American Motor Parts Co.—25 Plymouth Court, Chicago, Ill.
Aurora Automatic Machinery Co.—421 Claim St., Aurora, Ill.
Bay State Stamping Co.—380 Chandler St., Worcester, Mass.
Boston Pressed Metal Co.—171-73 Union St., Boston, Mass.
Canal St., Auburn.
Co.—6106-30 La
Co., Chicago, Ill.
Co.—N. Canal St., Chi-
Co.—646 W. 12th
Co., The.—Cincinnati, O.
Injector Co.—22 Abbott St., Mich.

CUPS—OIL (Continued)

Precision Appliance Co.—832 Austin Ave., Chicago, Ill.
Sherwood Mfg. Co.—Elmwood Ave. & Belt Line, Buffalo, N. Y.
Spence Mfg. Co.—279 Park St., Milwaukee, Wis.
Star Brass Mfg. Co.—108-114 E. Dedham St., Boston, Mass.
Tucker, C. F.—Hartford, Conn.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, Ohio.
Winkley Co., The.—226 Abbott St., Detroit, Mich.

CUPS—GREASE

American Injector Co.—Detroit, Mich.
American Lubricator Co.—Detroit, Mich.
Bowen Mfg. Co.—Canal St., Auburn N. Y.
Bown Machine Works.—Battle Creek, Mich.
Erie Stamping & Mfg. Co.—646 W. 12th St., Erie, Pa.
Hatcher Auto Parts Co.—Cleveland, O.
Lunkenheimer Co., The.—Cincinnati, O.
Penberthy Injector Co.—22 Abbott St., Detroit, Mich.
Powell Co., The William.—2525-31 Spring Grove Ave., Cincinnati, Ohio.
Sherwood Mfg. Co.—Elmwood Ave. & Belt Line, Buffalo, N. Y.
Spence Mfg. Co.—279 Park St., Milwaukee, Wis.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, Ohio.
Winkley Co., The.—226 Abbott St., Detroit, Mich.

CUPS—PRIMING

Acorn Brass Mfg. Co.—51 N. Peoria St., Chicago, Ill.
Boston Steam Specialty Co.—168-70 Congress St., Boston, Mass.
Imperial Brass Mfg. Co.—245-47 S. Jefferson St., Chicago, Ill.
Lunkenheimer Co., The.—Cincinnati, O.

CURTAINS—STORM

Automobile Equipment Co.—264 Jefferson Ave., Detroit, Mich.
Auto Top Co.—209 E. Columbia St., Fort Wayne, Ind.
Curtain Supply Co.—85-93 Ohio St., Chicago, Ill.
Detroit Motor Car Supply Co.—1250 Jefferson Ave., Detroit Mich.
Kroh Mfg. Co., C. Z.—Toledo, Ohio.
Motor Top Co. of New York.—216 W. 50th St., New York City.
Nathan Novelty Mfg. Co.—88 Reade St., New York City.
National India Rubber Co.—Bristol, R. I.
Perfection Storm Shield Co.—Clyde, O.
Racine, Wis.

CURTAINS—STORM (Continued)

Quimby & Co., J. M.—21-29 Division St., Newark, N. J.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
Safe Storm Shield Co.—Fremont, Ohio.
Vehicle Apron & Hood Co.—Columbus, Ohio.
Vehicle Top & Supply Co.—900 Cass St., St. Louis, Mo.
Warner Pole and Top Co.—1655 Central Ave., Cincinnati, Ohio.
Wiley & Son Co., Wm. H.—Hartford, Conn.
Wood & Son, Frederick R.—219 W. 19th St., New York City.

CUSHIONS—SEAT

American Auto Brass Co.—181 W. Maple St., Columbus, Ohio.
Auto Top Co.—209 E. Columbia St. Fort Wayne, Ind.
Cray Bros.—1244 W. 9th St., Cleveland, Ohio.
Empire Gear & Top Co.—413 N. 22nd St., Philadelphia, Pa.
Larrimore Buggy Top Co.—Baltimore, Md.
Mechanical Fabric Co.—Providence, R. I.
Newton & Son, W. H.—127 Elm St., Cortland, N. Y.
Pelinka, Frank—409 Blue Island Ave., Chicago, Ill.
Pneumatic Mfg. Co.—3 South St., New York City.
Springfield Auto Top & Upholstering Co.—102-106 Dwight St., Springfield, Mass.
Ventilated Cushion & Spring Co.—Jackson, Mich.

CUSTOM HOUSE BROKERS

Warner Co., The C. S.—Niagara Falls, Canada.

CUTOUT VALVES—MUFFLER

American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill.
Breeze Carbureter Co. of New York.—101 W. 66th St., New York City.
Gabriel Horn Mfg. Co.—934 Hamilton Ave., N. E., Cleveland, Ohio.
Garage Equipment Co.—Milwaukee, Wis.
Gray-Hawley Mfg. Co.—605-609 W. Fort St., Detroit, Mich.
Motor & Mfg. Works.—Geneva, N. Y.
Noonan Tool & Machine Works.—Rome, N. Y.
Powell Muffler & Timer Co.—42 Lafayette St., Utica, N. Y.
Smith & Co., D. B.—Utica, N. Y.

DASHES

A. Z. Co., The.—527 W. 56th St., New York City.
American Veneer Co.—Kenilworth, N. J.

DASHES (Continued)

Auto Body Co., The.—Franklin Ave., Lansing, Mich.
Badger & Sons Co., E. B.—63-69 Pitts St., Boston, Mass.
Bridgeport Vehicle Co.—Water & South Ave., Bridgeport, Conn.
Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Cole & Woop.—48 W. 67th St., New York City.
Dann Bros. & Co., The.—84 Franklin St., New Haven, Conn.
Detroit Auto Specialty Co.—909-11 Greenwood Ave., Detroit, Mich.
Dover Stamping & Mfg. Co.—385 Putnam Ave., Cambridge, Mass.
Everett, B. F.—Detroit, Mich.
Gray & Sons, Peter.—90 Union St., Boston, Mass.
Hall Co., Inc., E. H.—12 Elm St., Rochester, N. Y.
Hayes Mfg. Co.—360-70 Maybury Ave., Detroit, Mich.
Indianapolis Dash Co.—Indianapolis, Ind.
Kells Mfg. Co., W. J.—62 Van Winkle St., Jersey City, N. J.
Kinsey Mfg. Co.—Dayton, Ohio.
Lock & Co.—218 W. 84th St., New York City.
Long Mfg. Co.—1430-34 Michigan Ave., Chicago, Ill.
Moore & Munger Co.—602 W. 52nd St., New York City.
Mullins Co., W. H.—Salem, Ohio.
New York Dash & Fender Co.—516-20 W. 36th St., New York City.
Noye Mfg. Co.—50 Lake View Ave., Buffalo, N. Y.
Off & Co., Christian.—Indianapolis, Ind.
Ohio Blower Co.—43 Michigan St., Cleveland, Ohio.
Peters & Herron Dash Co., The.—Columbus, Ohio.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
Smith Co., A. O.—Park & Clinton Sts., Milwaukee, Wis.
United States Aluminum Co.—Pittsburg, Pa.
Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill.

DRILLS—MACHINE, PORTABLE

Gem Mfg. Co.—Spruce, near 33rd St., Pittsburg, Pa.
General Mfg. Co.—Elkhart, Ind.
Chicago Pneumatic Tool
 Fisher Bldg., Chicago, Ill.
Cincinnati Electric Tool Co.
 652 Evans St., Cincinnati, O.
Coates Clipper Mfg. Co.—Mass.

DRIP PANS

Burrows Co., E. T.—Portland, Me.
Dover Stamping & Mfg. Co.—385 Putnam Ave., Cambridge, Mass.

DRIP PANS (Continued)

- Hayes Mfg. Co.**—360-70 Maybury Ave., Detroit, Mich.
Mullins Co., W. H.—Salem, Ohio.
Ohio Blower Co., The.—330 Prospect Ave., N. W., Cleveland, Ohio.
Wilson & Co., F. Cortez.—239-241 Lake St., Chicago, Ill.
Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill.

DRUMS—BRAKE

- Avery Stamping Co.**—5207 Lakeside Ave., N. E., Cleveland, Ohio.
Crosby Co.—Buffalo, N. Y.
Keim Mills, Inc., John R.—Kensington Ave. & Erie Tracks, Buffalo, N. Y.
Worcester Presed Steel Co.—North & Barber Aves., Worcester, Mass.

DRY BATTERIES, see BATTERIES, PRIMARY

DYNAMOS, see GENERATORS, ELECTRIC

ELECTRIC CHARGING APPARATUS

- Bronson & Davis.**—463 Fairmount Ave., Blue Island, Ill.
Bullock Electric Mfg. Co.—Cincinnati, Ohio.
Electric Vehicle & Supply Co.—621 Grand Ave., Milwaukee, Wis.
Engineering Specialty Co., Inc.—143 Liberty St., New York City.
General Electric Co.—Schenectady, N. Y.
General Power Co., The.—100 William St., New York City.
Helios Mfg. Co.—Bridensburg, Philadelphia, Pa.
New England Motor Co.—Liberty Sq., Lowell, Mass.
Perfection Magneto Co.—Anderson, Ind.
Roth Bros. & Co.—27-29 S. Clinton St., Chicago, Ill.
South Broad Automobile Co.—729 S. Broad St., Philadelphia, Pa.
Stanley & Patterson.—23 Murray, 27 Warren Sts., and 329 4th Ave., New York City.
Starling Electric Motor Co.—Dayton,

Co.—301 Division St.,
 on City, Ind.
 trical Mfg. Co.—St. Louis,
 Electric & Mfg. Co.—
 s, Pa.

**AC CURRENT—RECTIFIER,
 ee RECTIFIERS—MERCURY
 ARC**

ELEVATORS—GARAGE

- Brewer, Elias.**—32 Sudbury St., Boston, Mass.
Eaton & Prince.—76 Michigan St., Chicago, Ill.
New American Elevator Co.—Curtis & Jefferson Aves., Columbus, Ohio.
Otis Elevator Co.—Railway Exchange, Chicago, Ill.
Parkhurst Mfg. Co.—Peru, Ind.
Storm Mfg. Co.—Foot of Center St., Newark, N. J.

ENAMELS

- Acme White Lead & Color Works.**—Detroit, Mich.
Adams & Elting Co.—155 W. Washington St., Chicago, Ill.
American Enamel Co.—Providence, R. I.
Arnstein, Eugene.—45th & Shields Ave., Chicago, Ill.
Berry Bros., Ltd.—Detroit, Mich.
Buffalo Enamel & Stain Co.—481 Elliott Sq., Buffalo, N. Y.
Detroit White Lead Works.—532 E. Milwaukee Ave., Detroit, Mich.
Felton, Sibley & Co.—136-40 N. 4th St., Philadelphia, Pa.
Glidden Varnish Co.—Rockfellow Bld., Cleveland, Ohio.
Masury, John W. & Son.—44-50 Jay St., Brooklyn, N. Y.
Patterson-Sargent Paint Co.—Cleveland, Ohio.
Rosenbluth & Co., A. J.—106 Park St., New Haven, Conn.
Rubber Paint Co.—154-56 W. Van Buren St., Chicago, Ill.
Standard Varnish Works.—29 Broadway, New York City.
Watts De Golyer Co., The.—377 Illinois St., Chicago, Ill.

ENGINES—STEAM

- Abell, Rollin.**—370 Atlantic Ave., Boston, Mass.
Dieter Steam Engine Works.—123 Liberty St., New York City.
Esty, Wm.—59 Mill St., Laconia, N. H.
Gas Engine & Power Co. & Chas. L. Seabury Co.—Morris Heights, N. Y.
Gas Engine Whistle Co.—1133 Broadway, New York City.
Kilburn, Edwin.—Spring Valley, Minn.
Lakeport Mfg. Co.—Lakeport, N. Y.
Mason Regulator Co.—158 Summer St., Boston, Mass.
Nadig & Bros. Mfg. Co., C. H.—1624 N. 4th St., Allentown, Pa.
Offeldt & Sons, F. W.—Nyack-on-the-Hudson, N. Y.
Racine Engine & Machinery Co.—Racine, Wis.
Ramsey Mfg. Co.—472 Bullitt Bldg., 4th & Walnut Sts., Philadelphia, Pa.

ENGINES—STEAM (Continued)

Randall, G. N.—1094 Frenck St., Meadville, Pa.
Rochester Machine Tool Works, Ltd.—Rochester, N. Y.
Santa Ana Machine & Foundry Co.—Santa Ana, Cal.
Walker & Co., E. C.—1913-23 Logan St., Louisville, Ky.
Williams Co., The John.—114-18 Liberty St., New York City.

EJECTORS

Rue Mfg. Co.—215 Race St., Philadelphia, Pa.
Sherwood Mfg. Co.—Elmwood Ave. & Belt Line, Buffalo, N. Y.

EXHAUST HORNS, see HORNS

EXPANDERS—TUBE

Forg, Peter.—Park St., Somerville, Mass.
Niles-Bement-Pond Co.—111 Broadway, New York City.
Novelty & Repair Shop.—Milfords, Ohio.

EXTINGUISHERS—FIRE

Badger Chemical Mfg. Co.—143 Reade St., Milwaukee, Wis.
Badger Fire Extinguisher Co., The.—32 Portland St., Boston, Mass.
Childs Co., O. J.—48-50 Liberty St., Utica, N. Y.
Harris Safety Co.—39 E. 20th St., New York City.
Haverhill Fire Appliance Co.—40 Merrimack St.; factory, Island Park, Haverhill, Mass.
Hayward & Co.—20 Warren St., New York City.
Johns-Manville Co., H. W.—100 William St., New York City.
Landau, Henry W.—117 Green St., Newark, N. J.
Liberty Association.—12 State St., Chicago, Ill.
Little Grant Mfg. Co.—88 Wall St., New York City.
Minimax Co.—1161-75 Broadway, New York City.
Monarch Fire Appliance Co.—249 Pearl St., New York City.
Nevermiss Fire Extinguisher Co.—Middletown, N. Y.
Phoenix Appliance Co.—15 W. 28th St., New York City.
Rex Fire Extinguisher Co.—74 Cortland St., New York City.
Stempel Fire Apparatus Mfg. Co.—4520 N. 20th St., St. Louis, Mo.

FAN BELTS, see BELTING LEATHER AND BELTING WIRE

FASTENERS—CURTAIN

Bowers Metal Stamping Co.—718 E. 11th St., New York City.
Carr, F. S.—74 Pearl St., Boston, Mass.
Metal Stamping Co.—243 West St., New York City.
Murphy Co., G. W. J.—Merrimac, Mass.
Neider Co., Inc., The F. A.—Augusta, Ky.
Parry & Co., A. N.—Amesbury, Mass.
Roehm & Davison, Ltd.—91-95 W. Woodbridge St., Detroit, Mich.
Taylor & Co., H. D.—101-105 Oak St., Buffalo, N. Y.
United States Fastener Co.—95 Milk St., Boston, Mass.
Weiss & Son.—4725 Cottage Grove Ave., Chicago, Ill.

FENDERS, see GUARDS—MUD

FILLERS—WOOD

Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill.
Chase, Roberts & Co.—West Ave. & Fifth St., Long Island City, N. Y.

FITTINGS—PIPE

Barrett Mfg. Co., James.—48 Pearl St., Boston, Mass.
Belfield & Co., H.—435 N. Broad St., Philadelphia, Pa.
Belknap Mfg. Co.—Bridgeport, Conn.
Buckeye Iron & Brass Works.—324 E. 3rd St., Dayton, Ohio.
Central Brass Works.—Cincinnati, Ohio.
Crane & Co.—519 S. Canal St., Chicago, Ill.
Dalton, Ingersoll Co.—171 High St., Boston, Mass.
Darling Pump & Mfg. Co.—Williamsport, Pa.
Detroit Sanitary Supply Co.—Detroit, Mich.
Fewless-Leen Brass & Iron Co.—Cincinnati, Ohio.
Fries & Co.—89-93 Main St., Buffalo, N. Y.
Hamlin & Emery Brass Co.—26 Island St., Boston, Mass.
Haydenville Co.—Haydenville, Mass.
Hoffman & Billings Mfg. Co.—Milwaukee, Wis.
Ideal Mfg. Co.—Detroit, Mich.
Illinois Malleable Iron Co.—Chicago, Ill.
Imperial Brass Mfg. Co.—Person St., Chicago, Ill.
McDonald & Morrison—Dubuque, Iowa.
McNab & Harlin Mfg.—New York City.
McRae & Roberts—Coburn Ave., Detroit, Mich.
Mason Regulator Co.—Boston, Mass.
Milwaukee Brass Mfg. Co.—Wis.

FITTINGS—PIPE (Continued)

- Mullaney's Sons, James.**—141 E. 25th St., New York City.
New Britain Brass Co.—New Britain, Conn.
Queen City Brass & Iron Works.—Cincinnati, Ohio.
Rose, Clarence H.—1905 Park Row Bldg., New York City.
Rundle-Spence Mfg. Co.—Milwaukee, Wis.
Thomas Brass & Iron Co.—Waukegan, Ill.
Walker & Co., E. C.—1913-23 Logan St., Louisville, Ky.
Western Tube Co.—Kewanee, Ill.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, O.
Worcester Pressed Steel Co.—North and Barber Aves., Worcester, Mass.

FITTINGS—BRASS

- A. Z. Co., The.**—527 W. 56th St., New York City.
Barrett Mfg. Co.—48 Pearl St., Boston, Mass.
Belfield & Co., H.—435 N. Broad St., Philadelphia, Pa.
Belknap Mfg. Co.—Bridgeport, Conn.
Best Mfg. Co.—Pittsburg, Pa.
Boston Steam Specialty Co.—168-70 Congress St., Boston, Mass.
Buckeye Iron Works.—324 E. 3rd St., Dayton, Ohio.
Central Brass Works.—Cincinnati, Ohio.
Chambers & Ainslee.—2 Commercial St., Newark, N. J.
Dalton Ingersoll Co.—Boston, Mass.
Darling Pump & Mfg. Co.—Williamsport, Pa.
Detroit Sanitary Supply Co.—Detroit, Mich.
Douglass & Lomason Co.—302-10 Grand River Ave., Detroit, Mich.
Eastwood Wire Mfg. Co.—Belleville, N. J.
Eaton, Cole & Burnham Co., The.—Bridgeport, Conn.
Fewless-Leen Brass & Iron Co.—Cincinnati, Ohio.
Fries & Co.—89-93 Main St., Buffalo, N. Y.
Hamlin & Emery Brass Co.—Boston, Mass.
Haydenville Co.—Haydenville, Mass.
Hoffman & Billings Mfg. Co.—Milwaukee, Wis.
Ideal Manufacturing Co.—Detroit, Mich.
Jarecki Manufacturing Co.—Erie, Pa.
McDonald & Morrison Mfg. Co., A. Y.—Dubuque, Iowa.
McNab & Harlin Mfg. Co.—56 John St., New York City.
McRae & Roberts Co.—227-35 Campbell Ave., Detroit, Mich.
Milwaukee Brass Mfg. Co.—Milwaukee, Wis.

FITTINGS—BRASS (Continued)

- Mullaney's Sons, James.**—141 E. 25th St., New York City.
New Britain Brass Co.—New Britain, Conn.
Petrie, John.—New Haven, Conn.
Pittsburg Valve & Fittings Co.—Pittsburg, Pa.
Powell Co., The William.—2525-31 Spring Grove Ave., Cincinnati, Ohio.
Powhattan Brass & Iron Works.—Charleston, W. Va.
Queen City Brass & Iron Works.—Cincinnati, Ohio.
Rundle-Spence Mfg. Co.—Milwaukee, Wis.
Rose, Clarence H.—1905 Park Row Bldg., New York City.
Smith & Co., Jos. N.—4th & Porter Sts., Detroit, Mich.
Spealsman Supply & Pipe Co.—Wilmington, Del.
Standard Sanitary & Mfg. Co.—Pittsburg, Pa.
Stebbens Mfg. Co., E.—Springfield, Mass.
Thomas Brass & Iron Co.—Waukegan, Ill.
Western Tube Co.—Kewanee, Ill.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, O.
Woodruff & Sons Co., Walter.—Mount Carmel, Conn.

FIXTURES—TOP

- Amesbury Brass & Foundry Co.**—Amesbury, Mass.
Brown & Co., S. N.—Dayton, Ohio.
Coops Co., C. W.—3 Appleton St., Boston, Mass.
Cortland Forging Co.—Cortland, N. Y.
Crandall, Stone & Co.—Binghamton, N. Y.
Driven, B. D.—71 Hamilton St., New Haven, Conn.
English & Mersick Co.—New Haven, Conn.
Evans Mfg. Co.—118 N. Brookline St., Boston, Mass.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Globe Brass Works.—13-15 Macomb St., Detroit, Mich.
Harper Co., Walter J.—229-31 Mulberry St., Newark, N. J.
Murphy Co., G. W. J.—Merrimac, Mass.
Non-Corrosive Metal Works, Inc.—Watertown, Mass.
Parry & Co., A. N.—Amesbury, Mass.
Scherer & Co., H.—Detroit, Mich.

FLANGE COUPLINGS, see COUPLINGS, PIPE

FLANGES—HUB

- Boston Pressed Metal Co.**—171-73 Union St., Worcester, Mass.

FLANGES—HUB (Continued)

Crosby Co.—Buffalo, N. Y.
Globe Machine & Stamping Co.—3868 Hamilton Ave., N. E., Cleveland, Ohio.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Keim Mills, Inc., John R.—Kensington Ave. & Erie Tracks, Buffalo, N. Y.
Worcester Pressed Steel Co.—North & Barber Aves., Worcester, Mass.

FLOATS—CARBURETTER

Armstrong Cork Co.—23rd St. & A. V. Ry., Pittsburg, Pa.
Goodwin & Kintz Co.—Winsted, Conn.
Hercules Float Works.—200 Franklin St., Springfield, Mass.
Naugatuck Malleable Iron Co.—Naugatuck, Conn.

FLUID—TIRE FILLING

Biko Mfg. Co.—Hubbardson, Mass.
Buffalo Specialty Co.—3751-77 Elliott Sq., Buffalo, N. Y.
Elastes.—rue Danton, Levallois-Perret, France.
Elastic Tire Filling Co.—52 Church St., Boston, Mass.
Elastro Mfg. Co., The.—26 State St., Hartford, Conn.
Gumelastic Tire Co.—920-22 Bolivar Rd., Cleveland, Ohio.
Jackson Tire Filling & Refilling Co.—190 W. Jackson Blvd., Chicago, Ill.
Le Reggerton.—37 rue des Abondances, Boulogne-sur-Seine, France.
Linole Mfg. Co.—Santa Clara, Cal.
Longhurst, James S. Jr.—Lynbrook, L. I. N. Y.
Motor Car Supply Co.—1425-27 Michigan Ave., Chicago, Ill.
Newmastic Tire Co.—151 W. 68th St., New York City.
New York Anti-Puncture Tire Co.—132 W. 49th St., New York City.

FOOT WARMERS, see HEATERS, AUTOMOBILE

FORGES

American Blower Co.—Detroit, Mich.
American Gas Furnace Co.—23 John St., New York City.
Boynton & Plummer.—Worcester, Mass.
Buffalo Forge Co.—Buffalo, N. Y.
Clayton & Lambert Mfg. Co.—Detroit, Mich.
Miner & Peck Mfg. Co.—New Haven, Conn.
National Cement & Rubber Mfg. Co.—3053-59 Monroe St., Toledo, Ohio.

FORGINGS—DROP

American & British Mfg. Co.—Bridgeport, Conn.
Anderson Forge & Machine Co.—Detroit, Mich.

FORGINGS—DROP (Continued)

Atlas Drop Forge Co.—Lansing, Mich.
Atwater Mfg. Co., The.—Southington, Conn.
Baker Mfg. Co., Jas. H.—503 Park Bldg., Pittsburg, Pa.
Barnett Drop Forging Co.—East Hampton, Mass.
Bates Forge Co.—227 W. Merrill St., Indianapolis, Ind.
Belden Machine Co.—Whalby Ave. & Tryon St., New Haven, Conn.
Bethlehem Steel Co.—South Bethlehem, Pa.
Billings & Spencer Co.—Hartford, Conn.
Blakeslee Forging Co.—Plantsville, Conn.
Boston Pressed Metal Co.—171-73 Union St., Worcester Mass.
Cambria Forge Co.—Cleveland, Ohio, and Johnstown, Pa.
Cape Ann Tool Co.—Granite St., Pigeon Cove, Mass.
Carpenter Steel Co.—Reading, Pa.
Chicago Drop Forge & Foundry Co.—West Pullman, Ill.
Clapp Mfg. Co., The E. D.—Auburn, N. Y.
Cleveland Hardware Co.—1300 Lake St., Cleveland, Ohio.
Columbus Bolt Works.—162 W. Randolph St., Columbus, Ohio.
Consolidated Mfg. Co.—Toledo, Ohio.
Corliss Engine Works.—Providence, R. I.
Cortland Forging Co.—Cortland, N. Y.
Crescent Forgings Co.—Oakmount, Pa.
Detroit Forging Co.—Detroit, Mich.
Detroit Steel Product Co.—91 E. Fort St., Detroit, Mich.
Eastern Forge Co.—70 Kilby St., Boston, Mass.
Eccles Co., Richard.—Clark and S. Division Sts., Auburn, N. Y.
Ellsworth, J. M.—518 W. 22d St., New York City.
Funk Engineering Co.—39-45 14th St., Hoboken, N. J.
Gautier & Co., D. G.—20 Cliff St., New York City.
General Drop Forge Co.—1738 Elwood Ave., Buffalo, N. Y.
Gerhab, Jacob.—158-64 N. 3rd St., Philadelphia, Pa.
Granger's Drop Forge Works.—Chicago, Ill.
Hoyt Elevator Co.—129 Pearl ton, Mass.
Indianapolis Drop Forging Co.—apolis, Ind.
Jones & Co., E. J.—Arlingtc " Mass.
Keystone Drop Forge Co.—C
Kilborn & Bishop Co., The.—Lloy cor Chapel St., New Haven, Conn
Kingston Truck & Bolt Co.—King N. Y.

FORGINGS—DROP (Continued)

Machinery Forging Co.—Hamilton & Marquette Sts., Cleveland, Ohio.
McCutcheon Gear & Mfg. Co.—205 W. South St., Indianapolis, Ind.
Michigan Bolt & Nut Works.—Fort Mel-drum Ave., Detroit, Mich.
Moore Drop Forging Co.—Springfield, Mass.
Paige-Storms Drop Forge Co.—Chicopee Falls, Mass.
Parker, Surrey.—Pinetown, N. C.
Penberthy Injector Co.—Detroit, Mich.
Revere Drop Forge Co.—Revere, Mass.
Richmond Forgings Corp.—Belle Isle, Richmond, Va.
Rue Mfg. Co.—215 Race St., Philadel-phia, Pa.
Ryman Co., K. C.—164 Market St., New-ark, N. J.
Scranton Forging Co.—Scranton, Pa.
Seward & Son Co., M.—New Haven, Conn.
Smith & Co., H. D.—Plantsville, Conn.
Strieby & Foote Co.—301 Ogden St., Newark, N. J.
Sundberg Co., J. A.—271 W. Kenzie St., Chicago, Ill.
Trasue & Williams Co., The.—Alliance, Ohio.
Union Drop Forge Co.—64-76 E. Ohio St., Chicago, Ill.
Western Drop Forge Co.—Marion, Ind.
Western Malleable Steel Co.—1250 River St., Detroit, Mich.
Wilcox Mfg. Co., D.—Mechanicsburg, Pa.
Williams & Co., J. H.—150 Hamilton Ave., Brooklyn, N. Y.
Wyman & Gordon.—30 Bradley St., Worcester, Mass.

FRAMES—PRESSED STEEL

American & British Mfg. Co.—Bridge-port, Conn.
Baudier, Ch.—30 rue Bandin, Levallois, France.
Bethlehem Steel Co.—South Bethlehem, Pa.
Bielefelder Press und Giehwerke Actien-gesellschaft.—Brackwede-Bielefeld, Germany.
Bismarkhütte Actiengesellschaft.—Bis- khütte, Schientochlowitz, Silesia, many.
on et Vallette.—Rive-de Gier, Loire, nce.
istron, Jean Maxime.—68 rue Mar- in, Levallois, Seine, France.
ingwort, Rud.—Nürnberg, Germany.
et Bacalan, Société Anonyme de vaux.—15 Ave. Matignon, Paris, nce.
s de Donai.—52 Bvd. Haussman, ris, France.

FRAMES—PRESSED STEEL (Continued)

Forges et Ateliers du Nord.—Turcoing, France.
Galoisy, Emile.—6 passage d'Isly, Leval- lois, Seine, France.
Garford Co.—Elyria, Ohio.
Hamoir, Dachane, et Cie.—Herstel, Bel- gium.
Hydraulic Pressed Steel Co.—E. 61st St., Cleveland, Ohio.
Kinsey Mfg. Co.—Dayton, Ohio.
Krupp, Friedrich.—Essen, Germany.
Lemoine.—Ivry-Port, Paris, France.
Merchant & Evans Co.—517 Arch St., Philadelphia, Pa.
Parish Mfg. Co.—7th & Chestnut Sts., Reading, Pa.
Rubery & Co.—Darlaston, England.
Smith Co., A. O.—Park & Clinton Sts., Milwaukee, Wis.
Société Anonyme des Ateliers de Con- struction, Forges et Fonderies d'Haut- mont.—Hautmont, Nord, France.
Société Française de Travaux Métal- lique.—Hautmont, Nord, France.

FRAMES—TUBULAR

Gayet Bourgeois.—63 rue Louis-Blanc, Lyon, France.
Société Anonyme des Tubes et Chassis Cloisonnés.—225 rue du Vieux-Pont- de-Sévres, Billancourt, France.

FUNNELS

Dover Stamping & Mfg. Co.—385 Put- nam Ave., Cambridge, Mass.
Gilbert & Barker Mfg. Co.—80-82 Fourth Ave., New York City.
Gray & Sons, Peter.—90 Union St., Bos- ton, Mass.
Johnson Sporting Goods Co., Iver.—163- 165 Washington St., Boston, Mass.
Taliaferro, W. T.—258 Broadway, New York City.
Wilson & Co., F. Cortez.—139-41 Lake St., Chicago, Ill.

FURNACES—HARDENING AND TEMPERING

Buffalo Dental Mfg. Co.—587-89 Main St., Buffalo, N. Y.

GALVANIZING

Bridgeport Electric Plating Co.—Bridge- port, Conn.
Galvanizing Co.—525 N. Front St., Phila- delphia, Pa.
United States Electro-Galvanizing Co.— 1-9 Park Ave., Brooklyn, N. Y.

GARAGES

A

Abbott's Garage.—West Derry, N. H.
Garage.
Acme Garage.—443-445 4th St., Brooklyn, N. Y.

GARAGES (Continued)

Acme Garage Co., Inc.—13th and Tacoma Ave., Tacoma, Wash. Buick, Cadillac; garage.
Acme Motor Co.—302 W. 8th St., Reading, Pa. Garage. (Acme.)
Acton Garage.—137 W. 89th St., New York City. Garage.
Adams, George S.—74 Grove Ave., Elgin, Ill. Garage.
Adland Storage & Auto Co.—240 7th Ave., Minneapolis, Minn. Garage.
Advance Automobile Co.—18th and Clair St., Cleveland, O. Garage.
Akron Automobile Garage.—Cor. Main & Cedar Sts., Akron, Ohio. Garage; repairing; supplies. (Franklin, Winton.)
Albany Garage Co.—28-30 Howard St., Albany, N. Y. Repairing; supplies. (Peerless, Thomas, Matheson, Isotta, Stevens-Duryea.)
Albany Hardware & Iron Co.—42 State St., Albany, N. Y. Garage.
Albin, H. A.—152 N. Main St., Concord, N. H. Garage.
Aldrich Auto Co.—Atlanta, Ga. Garage.
Alexander, W. G.—116 10th St., Toledo, Ohio. Garage.
Alger, P. B.—244 Union St., Olean, N. Y. Garage.
Allenhurst Garage & Auto Station.—135-137 West 37th St., New York City. Garage.
Allfrey's Auto Garage.—Johnstown, N. Y. Garage.
Alpine Automobile Co.—238 W. 108th St., New York City.
Allsopp, James A.—331 4th St., Brooklyn, N. Y.
American Locomotive Auto Co.—Hemlock & Valley Sts., Providence, R. I. Garage. (Berliet.)
Anderson Auto Co.—314 4th Ave., N., Nashville, Tenn. Garage.
Anderson Automobile Co.—Anderson, S. C.—Garage.
Anderson Automobile Co.—41-43 Downer Pl., Aurora, Ill. Garage; repairs; supplies. (Rambler, White.)
Andrews, George.—437 Pearl St., Buffalo, N. Y. Garage.
Angelus Motor Car Co.—110 E. 3rd St., Los Angeles, Cal. Garage.
Annett's Garage.—15-17 Harper St., Detroit, Mich. Garage.
Ansonia Auto Co.—235 W. 69th St., New York City. Garage.
Antler Stable & Garage Co.—Toledo, Ohio. Garage.
Arcade Machine Works.—New Milford, Conn. Garage.
Ardley Motor Car Co.—50th St. & Broadway, New York City. Garage.
Arion Garage, Inc.—485 Park Ave., New York City. Garage.
Arizona Auto Co.—Phoenix, Ariz. Garage.

GARAGES (Continued)

Armack Motor Co.—472 Carroll Ave., Chicago, Ill. Garage.
Armstrong & Hunter.—356 13th St., Brooklyn, N. Y. Garage.
Armstrong & Sons.—Maryville, Ohio. Garage.
Army Cycle Mfg. Co.—130-132 Meeting St., Charleston, S. C. Garage; repairing. (Cadillac, Buick.)
Arnold, E. L.—San Juan, Porto Rico. Garage.
Arnold, W. H.—Bangor, N. Y. Garage.
Arron Automobile Co.—161 Commerce St., New Haven, Conn. Garage.
Aschaffenberg Co., Ltd.—821 Barrone St., New Orleans, La. Garage.
Aschenburg, Wm.—Madison Ave., Perth Amboy, N. J. Garage.
Asheville Cycle & Auto Co.—15 Lexington Ave., Asheville, N. C. Garage; repairing. (Cadillac, Knox.)
Aspinwall Hotel Co.—Lenox, Mass. Garage.
Aster Garage.—123 W. 52nd St., New York City. Garage.
Aston Automobile Repair & Storage Co.—T. R.—1185 State St., Bridgeport, Conn.
Astor Garage.—56 Sherman Ave., Newark, N. J. Garage.
Atlanta Auto Co.—Atlanta, Ga. Garage.
Atlas Motor Co.—102 W. 107th St., New York City. Garage.
Atwood Mfg. Co.—Amesbury, Mass. Garage.
Auburn Agency.—Santa Anna, Cal. Garage.
Auburn Automobile Co.—Water St., next to Osborne House, Auburn, N. Y. Garage; repairs; supplies. (Franklin, Pope-Hartford, Royal, Northern.)
Auburn Ave. Auto Station.—419 Auburn Ave., Buffalo, N. Y. Garage.
Auction Co.—9th St., Pittsburg, Pa. Garage.
Augusta Garage Co.—519 Broad St., Atlanta, Ga. Garage.
Austin, H. K.—Reading, Mass. Garage.
Auto Car Equipment Co.—77 Edward St., Buffalo, N. Y. Garage; supplies.
Auto Car Garage.—38 Riley St., Buffalo, N. Y. Garage.
Auto Club Garage.—451 Vermont Ave., Buffalo, N. Y. Garage.
Auto Corp & Agency.—138 W. 38th St., New York City. Garage.
Auto Equipment Co.—477 Cleveland, Ohio. Garage.
Auto Equipment Co.—260 Detroit, Mich. Garage.
Auto Exchange.—7 Reserveidence, R. I. Garage.
Auto Express Delivery C—Cleveland, Ohio. Garage.
Auto Garage & Repair Co.—Dayton, O. Garage.

GARAGES (Continued)

Auto Garage Co.—701 Quincy St., Brooklyn, N. Y. Garage.
Auto Garage.—146 W. 39th St., New York City. Garage.
Auto Garage.—Calle del Bosque, Mexico City, Mexico. Garage.
Auto Hospital.—425 Lake Ave., Rochester, N. Y. Garage.
Auto Inn.—345 W. 2nd St., Elyria, Ohio. Garage.
Auto Inn.—226 Main St., Oshkosh, Wis. Garage.
Auto Livery.—1604 Broadway and 142 W. 18th St., New York City. Garage.
Auto Livery Co.—234 14th St., Washington, D. C. Garage.
Auto Livery Co.—1375 Ontario St., Cleveland, O.
Auto Machine Works.—Corona, Cal. Garage; repairing. (Rambler.)
Auto Mart.—37th St. & 7th Ave., New York City. Garage.
Automobile Arcade.—Broadway & 49th St., New York City. Garage.
Automobile Co.—365 Fell St., San Francisco, Cal. Garage.
Automobile Auction Co. of America.—41-43 W. 63d St., New York City. Garage.
Automobile Depot, Inc.—215 W. 48th St., New York City. Garage.
Automobile Exchange.—1545 Michigan Ave., Chicago, Ill. Garage.
Automobile Exchange & Storage Co.—133-139 W. 38th St., New York City. Garage; repairing. (Second-hand cars.)
Automobile Exchange & Supply Co.—18 Sabin St., Providence, R. I. Garage.
Automobile Garage & Machine Shop.—Craven St. (Ligonier); garage.
Automobile Garage & Repair Co.—Kalamazoo, Mich. Garage.
Automobile Hire & Sales Co.—231 W. 40th St., New York City. Garage.
Automobile Palace.—152 W. Jackson Blvd., Chicago, Ill. Garage.
Automobile Parts & Equipment Co.—2224-2234 Michigan Ave., Chicago, Ill. Garage.
Automobile Service Co.—1812 Harney St., Omaha, Neb. Garage.
Automobile Station.—42-48 Pleasant St., Manchester, N. H. Garage; repairs; supplies.
Auto Motor Car Co.—804-808 Sycamore St., Cincinnati, Ohio. Garage; repairer. Welch, Stodker, Rapid Delivery (ear Electric Trucks.)
Transit Co.—Trane Bldg., Chicago. Garage.
Walling Co.—111 W. 37th St., New York City. Garage.
Walling & Touring Co.—304 W. 14th St., New York City. Garage.
Walling Co.—1626 Broadway, New York City. Garage.

GARAGES (Continued)

Auto Shop Co.—731 Vincent Ave., Cleveland, O. Garage; repairing. (Thomas Flyer, Thomas Detroit, Franklin.)
Auto Shop.—85½ Park St., Ashtabula, O. Garage.
Auto Sight Seeing Co.—77 Edward St., Buffalo, N. Y. Garage; rental service.
Auto Tally Ho Co.—1358 Broadway, New York City. Garage.
Auto Touring Co.—133 W. 38th St., New York City. Garage.
Auto Traffic Co.—401 Liberty Bldg., Pittsburg, Pa. Garage.
Auto Transportation Co.—309 W. 41st St., New York City. Garage.
Ayer Automobile Station.—E. Main St., Ayer, Mass. Garage; repairing; supplies.

B

B. & H. Motor Car Co.—147-151 W. 49th St., New York City. Garage; repairing.
Back Bay Automobile Co.—169-173 Huntington Ave., Boston, Mass. Garage.
Bagley, Daniel.—2 Alberton St., Somerville, Mass. Garage.
Baine, C. R.—1525 Seneca St., Buffalo, N. Y. Garage.
Baker, W. A.—307 Salem St., Medford, Mass. Garage.
Baldwin Motor Works.—Merrick Road, Freeport, N. Y. Garage; supplies.
Ballou, J. P.—175 Washington St., North Attleboro, Mass. Garage; repairing; supplies.
Baltimore Ave. Garage.—49th St. and Baltimore Ave., Philadelphia, Pa. Garage.
Bantam Anti-Friction Co.—Bantam, Conn. Garage.
Bargain Auto Co.—1628 Broadway, New York City. Garage.
Barnes, John C.—Branford, Conn. Garage.
Barrett, E. H.—Medina, N. Y. Garage.
Bath Automobile & Gas Engine Co.—Broad & Commercial Sts., Bath, Me. Garage; repairing; supplies. (Winton, Franklin, Cadillac.)
Battens Garage.—Richmond, Va. Garage.
Battery, F. E.—357 Fountain St., Providence, R. I. Garage.
Baughner, J. L.—Staunton, Va. Garage; repairing. (Rambler.)
Bay State Machine Co.—121 Peach St., Erie, Pa. Garage.
Beardsley & Son.—Woodstock, Ill. Garage.
Becker & Kurtz.—456 State St., Rochester, N. Y. Garage.
Becker, Louis.—1717 Deming Pl., Chicago, Ill. Garage.
Bedard & Carlisle.—Lake St., St. Albans, N. Y. Garage.

GARAGES (Continued)

Bedford Auto Garage.—220 Clinton Pl., Brooklyn, N. Y. Garage.
Bedford Garage Co.—1287 Bedford Ave., Brooklyn, N. Y. Garage.
Beebe, B. V.—Anaheim, Cal. Garage.
Beebe, Thos. S.—40 Tennis St., Albany, N. Y. Garage.
Begole, George D.—Denver, Colo. Garage.
Belcher, A. S.—Market St., Campello, Mass. Garage.
Bell, Billmeyer & Rotke.—211 W. 87th St., New York City. Garage.
Bell, B. T.—166 3rd Ave., N., Nashville, Tenn. Garage.
Bellinger's Garage.—10-12 Landers St., near Broadway, Newburgh, N. Y. Garage; repairs; supplies.
Belmar Garage.—521 Homeward Ave., Homewood, Pa. Garage.
Bemis Machine Co.—Lincoln St., Marlboro, Mass. Garage.
Bennett Auto Garage.—Oakland, Cal. Garage.
Bennett, R. R.—267 Green Ave., Brooklyn, N. Y. Garage.
Bensfield, C. R.—Dallas, Tex. Garage.
Bentell, O. F.—Seabright, N. J. Garage.
Benton Harbor Bicycle & Auto Works.—Benton Harbor, Mich. Garage.
Beresford, H. A.—444 Drayton St., Savannah, Ga. Garage.
Berg & Brehmer.—238 Jefferson Ave., Detroit, Mich. Garage.
Bergen & West Side Auto Co.—2535 Hudson Blvd., Jersey City, N. J. Garage.
Bergman, N. J.—Alder & 15th St., Portland, Ore. Garage.
Berkshire Cycle & Automobile Co.—92½ Main St., North Adams, Mass. Garage; repairing.
Best Auto Repair & Storage Co.—1548 Broadway, Denver, Colo. Garage.
Beverley Mfg. Co.—Beverley, Mass. Garage.
Biayas, B. H.—Cumberland, Md. (Maxwell); garage.
Biehl's Carriage Works.—Reading, Pa. Garage.
Binghamton Motor Car Co.—172-176 State St., Binghamton, N. Y. Garage. (Pope-Hartford, Pope-Toledo, Buick, Knox, Columbia, Babcock.)
Blocker, A. L.—Columbia, Tenn. Garage.
Bloomington Automobile Garage.—315 E. Front St., Bloomington, Ill. Garage.
Blue Ribbon Garage Co.—112 W. 75th St., New York. Garage.
Blue Ribbon Garage, The.—291 Fairfield Ave., Bridgeport, Conn. Garage; repairs; supplies. (Columbia, Winton, Cadillac, Franklin, Lozier.)

GARAGES (Continued)

Boda & Co., Robert F.—22 E. Rich St., Columbus, Ohio. Garage; repairing. (National, Mitchell.)
Boldt & Son, G. H.—Locust & 7th Sts., Dubuque, Iowa. Garage.
Bolton Automobile Co.—Mt. Royal Ave. & Dolphin St., Baltimore, Md. Garage; repairing. (Ford, Reo, Premier.)
Bonsfield, C. J.—818 Farragut St., Bay City, Mich. Garage.
Bootjer, G. M.—Cumberland, Iowa. Garage.
Borough Automobile Co.—12 New York Ave. and 185 Herkimer St., Brooklyn, N. Y. Garage.
Boswell, Geo. C.—Broad St., Danielson, Conn. Garage.
Bosset, E. G.—146 Main St., Bristol, Conn. Garage.
Boulevard Auto Co.—Fellsway, E., Somerville, Mass. Garage.
Boulevard Auto Garage.—204 Lincoln Park Blvd., Chicago, Ill. Garage.
Boulevard Automobile Garage.—2975 Boulevard, Jersey City, N. J. Garage.
Boulevard Auto Station.—Pawtucketville, Mass. Garage.
Bourdereaux's Automobile Garage.—629 Main St., Peoria, Ill. Garage.
Bowman Automobile Co., Sidney B.—225-31 W. 49th St., New York City. Garage; repairing. (Clement Bayard, Apperson.)
Bowser & Co., S. F.—540 Front Street, Toronto, Canada. Garage.
Bradford, P. S.—9 Liberty St., Newburyport, Mass. Garage.
Bradley, S. L.—809 N. Main St., Princeton, Ill. Garage; repairing. (Knox, Oldsmobile.)
Brady, A. C.—32 W. 33rd St., New York City. Garage.
Brassard, Joseph.—119 Lincoln St., Central Falls, R. I. Garage.
Brazier Auto Works.—38th & Market Sts., Philadelphia, Pa. Garage; repairing. (Marmon.)
Brazil Automobile Garage.—Main St., Brazil, Ind. Garage.
Breads, F. A.—328 E. Water St., Syracuse, N. Y. Garage.
Breed, E. S.—41 Columbus Ave., Boston, Mass. Garage.
Brenner, L. A.—25 Washington St., Gloversville, N. Y. Garage.
Brewer, W. W.—2787 6th Ave., N. Y. Garage.
Brigham & Saunders.—Commonw Ave., Malvern St., Brighton Garage.
Brighton Garage.—58 Mudd, Brighton, Mass. Garage.
Brignall, Geo.—5110 Calumet, Chicago, Ill. Garage.
Brinckmann Bros.—716 Frank Michigan City, Ind. Garage.

GARAGES (Continued)

Bristol Automobile Co.—Naugatuck Rd., Waterbury, Conn. Garage; repairing. (Thomas Flyer, Thomas Detroit.)
Broad Street Garage.—215-217 N. Broad St., Philadelphia, Pa. Garage.
Broadway Auto Exchange.—513 7th Ave., New York City. Garage.
Broadway Auto Renting Co.—164 W. 46th St., New York. Garage.
Broadway Motor Car Co.—144 Broadway, Lawrence, Mass. Garage.
Broehl & Galvin.—Pana, Ill. Garage.
Bronx Auto Garage.—1115 Boston Rd., New York. Garage.
Brookline Garage.—50-60 Washington St., Brookline, Mass. Garage.
Brooklyn Auto Exchange.—224 State St., Brooklyn, N. Y. Garage.
Brooklyn Automobile Co.—12 New York Ave., Brooklyn, N. Y. Garage.
Brookner & Co.—Dixon, Ill. Garage.
Brouse, W. E.—Cleveland, Ohio. Garage.
Brower, C. E.—Portland, Me. Garage.
Brown & Co., T. H.—Corry, Pa. Garage.
Browne, W. D.—132 S. Genesee St., Waukegan, Ill. Garage.
Brown, J. M.—Mansfield, Ohio. Garage.
Brown, L. W.—Elkland, Pa. Garage.
Brown's Garage.—60 St. George St., Toronto, Canada. Garage.
Brummitt, T. J.—Evansville, Ind. Garage.
Brunell, E. H.—359 Fulton St., Troy, N. Y. Garage.
Bryant & Johnson.—120 E. 84th St., New York City. Garage.
Bryant Garage.—50-56 W. 43rd St., New York. Garage; repairing.
Bryant Motor Car Co.—110 W. 41st St., New York City. Garage; rental service.
Buell & Co., D. H.—516 State St., New Haven, Conn. Garage.
Buffalo Auto Exchange.—401 Franklin St., Buffalo, N. Y. Garage; repairing. (Franklin.)
Buffalo Auto Livery.—123 Eagle St., Buffalo, N. Y. Garage.
Buffalo Auto Station.—240 W. Utica St., Buffalo, N. Y. Garage.
Buffalo Garage Co.—414 W. Ferry St., Buffalo, N. Y. Garage.
Bull, Henry, Jr.—12 Bull St., Newport, R. I. Garage.
Bull, Wm.—Canajoharie, N. Y. Garage.
Burdett Mills Co., Louis.—211-213 W. 5th St., New York City. Garage.
Burdett, J.—918 Larimer St., Denver, Colo. Garage.
Burdett, J.—31 Grant Square, Brooklyn, N. Y. Garage.
Burt, A.—Narragansett, R. I. Garage.

GARAGES (Continued)

Burtis & Son.—18 Jay St., Schenectady, N. Y. Garage.
Burton Reeves.—Freeport, Ill. Garage.
Burt & Co.—346 Halsey St., Newark, N. J. Garage.
Bushwick Garage.—58-62 Palmetto St., St., Brooklyn, N. Y. Garage.
Butrey, James.—Valley City, N. Dak. Garage.

C

Cadillac Auto Station.—Wyomissing, Pa. Garage.
Cadillac Motor Car Co.—265 Jefferson Ave., Detroit, Mich. Garage; repairing. (Cadillac.)
Calumet Auto Co.—116 E. 29th St., Chicago, Ill. Garage.
Cambridge Auto Co.—Cambridge, Md. Garage.
Cameron Auto Co.—313 Commerce St., Dallas, Texas. Garage; repairing. (Buick, Franklin, Pope-Toledo.)
Campana, John M.—Post Road, Port Chester, N. Y. Garage.
Campbell Auto Co.—Fort Dodge, Iowa, and Des Moines, Iowa. Garage; repairing. (Reo, Rambler, Mason.)
Campbell, A. V.—Kalamazoo, Mich. Garage.
Campbell Garage, The.—47 St. Louis St., Quebec, Canada. Garage; supplies.
Campbell, James.—455 Jackson Blvd., Chicago, Ill. Garage.
Campbell, T. V.—Galena, Kansas. Garage.
Canfield Auto Stations.—Canaan, Conn. Garage; repairing. (Knox, Stevens-Duryea, Waltham.)
Cantono Garage.—111 W. 37th St., New York City. Garage. (Cantono Electric.)
Capital City Automobile Works.—22 Plain St., Albany, N. Y. Garage.
Capital City Garage.—32 Chauncery St., Trenton, N. J. Garage.
Capital Garage.—337 Water St., Augusta, Me. Garage; repairs; supplies.
Capitol Hill Auto Co.—Pine & Broadway, Seattle, Wash. Garage; repairing. (Mitchell, Rambler.)
Carll Automobile Co.—Winchester, Mass. Garage.
Carlow Automobile Co.—51-59 Weir St., Taunton, Mass. Garage; repairing; supplies. (Winton, Buick.)
Carlton, Guy.—528 N. Main St., Bloomington, Ill. Garage.
Carmichael-Bray Co., Inc.—370 Golden Gate Ave., San Francisco, Cal. Garage; repairing. (Elmore.)
Carnahan, A. G.—Monroe & Madison Sts., Bloomington, Ill. Garage.
Carpenter & Volkhardt.—2559 Indiana Ave., Chicago, Ill. Garage.
Carpenter, J. C.—Chester, S. C. Garage.

GARAGES (Continued)

Carter, C. C.—Santa Monica, Cal. Garage.

Carthage Auto Garage.—Carthage, Mo. Garage; repairing. (Maxwell.)

Case Auto Co.—Aberdeen, S. Dak. Garage.

Case, George W.—54 Front St., Port Jervis, N. Y. Garage; repairing. (Rambler, Ford.)

Casey, Edward.—387 Central Ave., Far Rockaway, N. Y. Garage.

Catelein Andre G.—1446 Indiana Ave., Chicago, Ill. Garage.

Cateract Machine & Automobile Co.—1-3 W. Niagara St., Niagara Falls, N. Y. Garage.

Caulkins & Co., F. L.—405 -415 Main St., Middletown, Conn. Garage; repairing; supplies. (Cadillac, Knox, Winton, Pope-Hartford.)

Cedarhurst Auto Co.—Lawrence, N. Y. Garage.

Centaur Motor Co.—53-61 Franklin St., Buffalo, N. Y. Garage; repairing. (Peerless, Pope-Toledo, Winton, Autocar, Oldsmobile, Cadillac, Darracq.)

Central Auto Co.—18th St. & Grand Ave., Kansas City, Mo. Garage.

Central Auto Co.—Cor. Jackson Blvd. and Franklin St., Chicago, Ill. (Second-hand cars); garage; repairing.

Central Auto Co.—Alliance, O. Garage.

Central Auto Exchange.—14 Alexander Ave., W., Detroit, Mich. Garage.

Central Automobile Shop.—19 N. May St., Manchester, N. H. Garage.

Central Automobile Station Co.—55 West St., Pittsfield, Mass. Garage; repairing; supplies. (Pierce Arrow, Franklin, Pope-Hartford, Stevens-Duryea.)

Central Auto Station.—236 Main St., New Britain, Conn. Garage; repairing. (Stevens-Duryea.)

Central Auto Station.—238 W. 50th St., New York City. Garage.

Central Garage.—Durfee St., opp. Armory, Fall River, Mass. Garage; repairing; supplies.

Central Garage.—314 S. Camac St., Philadelphia, Pa. Garage.

Central Garage Co.—Rockford, Ill. Garage.

Central Garage Co.—1310 New York Ave., Washington, D. C. Garage.

Central Maine Automobile Garage.—8 Charles St., Waterville, Me. Garage.

Central Motor Car Co.—Washington & Fairand Sts., Bloomfield, N. J. Garage; repairing. (Mitchell, Jackson.)

Central Park Auto Garage.—1185 Market St., San Francisco, Cal. Garage.

Champaign Automobile Co.—Champaign, Ill. Garage; repairs. (Reo, Premier.)

Chandler & Sons, W. C.—Plymouth, Mass. Garage.

GARAGES (Continued)

Charleston Motor Co.—161 Meeting St., Charleston, S. C. Garage; repairing. (Reo, Premier.)

Chase & Nieson.—936 Jefferson Ave., Detroit, Mich. Garage.

Chase Auto Co.—201 Pitman St., Providence, R. I. Garage.

Chateau des Beaux Arts.—Huntington, Long Island, N. Y. Garage; repairing; supplies.

Chatfield, C. B.—1201 Center Ave., Bay City, Mich. Garage; repairing. (Haynes.)

Chelsea Auto Storage Co.—516 W. 37th St., and 517 W. 36th St., New York City. Garage; repairing. (Manhattan.)

Chelsea Garage.—California Ave., Atlantic City, N. J. Garage.

Chenoweth, W. B.—Snyder, Tex. Garage.

Chestnut Hill Auto Garage.—199 Commonwealth Ave., Newton Centre, Mass. Garage.

Chicago-by-Auto Co., Inc.—247 Franklin St., Chicago, Ill. Garage.

Childs & Co., Chas. H.—Utica, N. Y. Garage, cor. Cooper & Cornelia Sts.; salesrooms and offices, 12-18 Lafayette St. (Babcock, Packard, Franklin, Pope-Waverley, Pope-Hartford, White, Autocar.)

Chisholm-Phillips Automobile Co., The.—5906-5908 Euclid Ave., Cleveland, Ohio. Garage; repairing; supplies. (Stevens-Duryea.)

Christ, E. J.—7 Franklin St., Hempstead, N. Y. Garage.

Christie Motor Co.—51st St. & 12th Ave., New York City. Garage.

Christopher Bros.—1049 Sheffield Ave., Chicago, Ill. Garage.

Christ, Scott & Parshall.—Cooperstown, N. Y. Garage; repairing. (Deere, Cartercar.)

Church & Caswell.—Narragansett, R. I. Garage.

Church, E. B.—140 W. 42nd St., New York City. Garage.

Churchill & Co., F. E.—52 High St., Brockton, Mass. Garage.

Cincinnati Automobile Co., The.—215-217 E. 5th St., Cincinnati, Ohio. Garage; repairing; supplies. (Pope-Toledo, Pope-Hartford, Peerless.)

Cincinnati Motor Vehicle Co.—117 Opera Pl., Cincinnati, Ohio. Garage. (Pope-Waverley, Marmon)

Citizens Motor Car Co.—N. 1 & Main Sts., Cincinnati, O. Garage; repairing. (Packard, Cadillac, Autocar, Columbus)

Citizens Transit Co.—C. Garage.

City Automobile Co.—Ind. Garage; supplies.

GARAGES (Continued)

City Cycle & Auto Co.—29 Railroad St., Cortland, N. Y. Garage.
City Machine & Mfg. Co.—Detroit, Mich. Garage.
Clancey, J. F.—Western Ave., Gloucester, Mass. Garage.
Clandon, C. J.—Fairbury, Ill. Garage.
Clarence, Thomas J.—Beaton and Collins Sts., Corsicana, Tex. Garage.
Clarendon Auto Station.—2091 Clarendon Ave., Chicago, Ill. Garage.
Clark, A. E.—Huron, S. Dak. Garage. (Holsman.)
Clark Allis.—Medina, N. Y. Garage.
Clark Automobile Co., The E. R.—416 Worthington St., Springfield, Mass. Garage. (Thomas Flyer, Cadillac.)
Clark, B. B.—Livingston, Orange County, Fla. Garage; repairing. (Waltham.)
Clark, Frederick A.—Main & 3rd Sts., Zanesville, Ohio. Garage.
Clark, John.—1005 Park Ave., Chicago, Ill. Garage.
Clark, L. A. & A. T.—Cottage St., Portland, Me. Garage.
Clarksdale Machinery & Supply Mfg. Co.—Clarksdale, Miss. Garage; repairing.
Clark's Garage.—Boston Post Road, Stamford, Conn. Garage. (Winton.)
Clarkson & Oliver.—601-603 Mesquite St., Corpus Christi, Tex. Garage; repairing. (Northern, Ford, Rapid, Olds.)
Cleland, H. W.—61 E. Swain St., Buffalo, N. Y. Garage.
Clifton Hotel Garage.—Upper Bridge, Niagara Falls, N. Y. Garage.
Clinton, Walter R.—34 Elm St., West Haven, Conn. Garage.
Close Bros.—405 Smith St., Schenectady, N. Y. Garage; repairing; supplies. (Knox, Cadillac.)
Clowes, Chas.—Goodground, N. Y. Garage.
Co-Eck Garage Co.—Oil City, Pa. Garage.
Coey & Co., C. A.—1424-26 Michigan Ave., Chicago, Ill. Garage. (Thomas Detroit.)
Cohoes Auto Storage & Repair Station.—42 Van Rensselaer St., Cohoes, N. Y. Garage.
Coit, S. J.—21 Chestnut St., Norwich, Conn. Garage.
Colby, John W.—Norwalk, Conn. Garage.
Coleman, Galen.—11 Academy Ave., Middletown, N. Y. Garage.
Cole, S. R.—39 E. Third St., Dunkirk, N. Y. Garage.
Collingwood Garage Co.—Collingwood & Bancroft Aves., Toledo, Ohio. Garage.

GARAGES (Continued)

Collins, Daniel.—Main St., Marcus, Iowa. Garage.
Collison's Garage.—Church & Maple Sts., Burlington, Vt. Garage; repairs; supplies.
Collister & Sayle.—232 Superior Ave., Cleveland, O. Garage.
Colonial Auto Garage.—50-52 E. 39th St., Chicago, Ill. Garage.
Colonial Garage.—Narragansett Pier, R. I. Garage; repairs; supplies.
Colonial Garage.—220 W. 30th St., New York City. Garage; repairs; second-hand cars.
Columbia Road Auto Station.—616 Columbia Road, Boston, Mass. Garage.
Columbus Automobile Exchange.—1780 Broadway, New York City. Garage.
Columbus Machine Works.—Columbus, Ind. Garage.
Commercial Auto & Supply Co.—826 N. Howard St., Baltimore, Md. Garage.
Commission Automobile Co.—742 7th Ave., New York City. Garage.
Commission Auto Co.—1602 Michigan Ave., Chicago, Ill. Garage.
Congress Square Auto Station.—18 Forest Ave., Portland, Me. Garage.
Connecticut Motor Car Co.—321 Garden St., Hartford, Conn. Garage.
Consolidated Bicycle & Motor Co., Ltd.—185 Notre Dame St., E.; 224 Logan Ave.; 849 Main St., Winnipeg, Canada. Garage; repairing.
Continental Auto Co.—168 E. 75th St., New York City. Garage.
Contractors Electric Co.—9 Prospect St., Mt. Vernon, N. Y. Garage.
Cook, Benj. & Clark, Chas. J.—Sandwich, Mass. Garage.
Cook Electric Garage.—144 Pacific Ave., Long Beach, Cal. Garage.
Cook, H. H.—16 Baldwin St., Malden, Mass. Garage.
Cook Machine Co.—Rushville, Ind. Garage.
Cooney Automobile Co.—Toledo, Ohio. Garage.
Copeland & Taylor.—221 W. Washington St., Pontiac, Ill. Garage. (Jackson.)
Corbaley & Thorpe Auto Co.—443-449 Emerson St., Palo Alto, Cal. Garage; repairing. (Autocar, Columbia, Sun-set, Maxwell.)
Core, G. W.—High St., Columbus Grove, Ohio. Garage; repairing. (Mitchell.)
Corkran & Meloney.—12 S. Maryland Ave., Atlantic City, N. J. Garage.
Corston, C. H.—Jefferson Ave., Detroit, Mich. Garage.
Coryell, R. S.—Union Bldg., Clinton St., Newark, N. J. Garage.
Coulter, J. F.—Main St., Saybrook, Conn. Garage.

GARAGES (Continued)

- Courtenay, Dr. W. A.**—Hancock, Mich. Garage.
Covert & Williamson.—Ovid, N. Y. Garage.
Cowan, W. K.—830-834 Broadway, Los Angeles, Cal. Garage; repairing. (Rambler.)
Cowle & Pierson.—1413 Grand Ave., St. Louis, Mo. Garage.
Crafts, H. L.—233 E. 33d St., New York City. Garage.
Crane & Brewster.—243 Talbot Ave., Dorchester, Mass. Garage.
Crane & Co., G. F.—40 Clark St., Cleveland, Ohio. Garage.
Crane Auto & Garage Co.—Providence, R. I. Garage. (Atlas.)
Crane, J. E.—922-930 18th St., Denver, Colo. Garage; repairing. (Second-hand cars.)
Cranston & Co., T. H.—58 Wabash Ave., Chicago, Ill. Garage.
Craven Garage.—Kellogg, Iowa. Garage.
Crawford & Soper.—1010 Prospect Ave., Cleveland, Ohio. Garage.
Crescent Auto & Machine Co.—Cor. E. 2nd & Marr Sts., Fond du Lac, Wis. Garage; repairing. (Cadillac, Buick, Pope-Hartford, White.)
Crescent Automobile Co.—2565 Boulevard, Jersey City, N. J. Garage; repairing. (Cadillac, Pope-Hartford, Pope-Toledo.)
Crocker House Garage.—Golden St., New London, Conn. Garage.
Croffe, A. C.—Main St., Sellersville, Pa. Garage; repairing. (Rambler.)
Crofton Storage Battery Co.—423 Queen St., W., Toronto, Canada. Garage.
Cronk, E. B. & A. F.—7 Liberty St., Utica, N. Y. Garage.
Crook, Frank.—386 High St., Central Falls, R. I. Garage.
Crown Garage.—534 Washington St., Hudson, N. Y. Garage. (Franklin.)
Cryder & Co.—583 Park Ave., New York City. Garage; repairing. (French Mors, Leon-Bollée, Renault.)
Cuddeback, E. R.—122-124 E. 4th St., Tremont Neb. Garage; repairing. (Stoddard-Dayton, Reo, Ford, Mason, Premier.)
Culp Bros.—307 Forest Ave., Pacific Grove, Cal. Garage; repairing.
Culp, T. S.—625-631 Mahoning St., Canton, Ohio. Garage; repairing. (Gale, Wayne.)

D

- Dann's Auto Station, J. T.**—314 Main St., Danbury, Conn. Garage; repairs; supplies.
Darling, E. R.—138 Main St., Woonsocket, R. I. Garage.
Darrough Garage.—613 Throckmorton St., Fort Worth, Tex. Garage.

GARAGES (Continued)

- Dart Mfg. Co.**—524 Sheffield Ave., Chicago, Ill. Garage.
Davenport Auto Co.—Davenport, Ia. Garage.
Davis & Co., E. C.—155 Falls St., Seneca Falls, N. Y. Garage.
Davis Automobile Co., Inc.—7 Dorrance St., Providence, R. I. Garage; supplies; repairing. (Winton, Peerless, Locomobile, Oldsmobile, Cadillac, Darracq.)
Davis, E. R.—18 Park St., Rockland, Me. Garage.
Davis, R. L.—1003 W. Chestnut St., Louisville, Ky. Garage.
Davis, W. L.—Cor. Main St. and Park Ave., Waterbury, Vt. Garage.
Davy, Humphrey.—35 W. 43rd St., New York. Garage.
Dawson Machine Works.—2 Satgent St., Worcester, Mass. Garage.
Day Auto Co.—1407 S. 12th St., Kansas City, Mo. Garage.
Dean & Co., John M.—793 Westminster Ave., Providence, R. I. Garage.
Dean Bros.—160 N. Ionia Sts., Grand Rapids, Mich. Garage. (Jackson.)
Dean, W. A.—427 Washington Ave., North Newark, N. J. Garage.
Deckers, W. H.—95 Southampton St., Buffalo, N. Y. Garage.
De Lameter, E. B.—50 Market St., Poughkeepsie, N. Y. Garage.
De Lancy Garage.—22nd & Pine Sts., Philadelphia, Pa. Garage.
Delaware Ave. Garage.—257 Delaware Ave., Buffalo, N. Y. Garage.
Delmar Motor Car Co.—St. Louis, Mo. Garage.
Demler, Wm.—18 Kennedy St., Bradford, Pa. Garage.
Dempster Mill Mfg. Co.—Beatrice, Neb. Garage.
Demster Machinery Co., W. R.—16th & Walnut St., Kansas City, Mo. Garage; supplies; repairing.
Denison, L. E.—Cairo, Ill. Garage.
Derbab Mfg. Co.—Broad St., Lynn, Mass. Garage.
Derry, Thos.—466 Vermont St., Buffalo, N. Y. Garage.
Deselbrow Motor Car Co.—New Rochelle, N. Y. Garage.
Detroit Gas Engine & Machine Co.—Congress St., Detroit, Mi.
Detroit Oxford Mfg. Co.—Garage.
Devlin & Co.—1407 Michigan, Ill. Garage.
Dewey, F. S.—Marlboro,
Dewitt Automobile Co., T
 80th St., New York C
 repairing; recharging.
Dickson, J. D.—113 Bellevue
 port, R. I. Garage.

GARAGES (Continued)

- Disbrow Bros. Garage.**—Hillside Ave. & Hoffman Blvd., Jamaica, N. Y.—Garage; repairs; supplies. (Rainier, Ford, White, Stearns.)
- Doherty, H. B.**—24 Wall St., Binghamton, N. Y. Garage; repairing. (Cadillac, Franklin, Darracq, American Mercedes.)
- Dominion Automobile Co.**—London, Ontario, Canada. Garage.
- Dominion Motor Car Co., Ltd.**—11 Beaver Hall Hill, Montreal, Canada. Garage; repairs; supplies.
- Donnelly, John J.**—Doylestown, Pa. Garage.
- Dorris, Duncan A.**—155 Spruce St., Nashville, Tenn. Garage.
- Dorsch, H. S.**—1030 Albany St., Schenectady, N. Y. Garage.
- Doubleday Co., W. A.**—349 S. Warren St., Syracuse, N. Y. Garage.
- Dowling's Garage.**—26-30 Forest Ave., Portland, Me. Garage; repairs; supplies. (Thomas Flyer, Royal.)
- Downey & Bingham.**—159 Jay St., Albany, N. Y. Garage.
- Dow Portable Electric Co.**—Adams St., Braintree, Mass. Garage; repairing.
- Dragon Automobile Co.**—Kittery, Me. Garage.
- Draper Garage, The.**—Rear Masonic Block, Main St., Northampton, Mass. Garage.
- Dresser, S. R.**—Bradford, Pa. Garage.
- Dudley Auto School Co.**—250 Main St., Marlboro, Mass. Garage.
- Dudley, Fred F.**—55 Berkeley St., Boston, Mass. Garage.
- Dumas Auto Exchange.**—15 Prospect St., Manchester, N. H. Garage.
- Duncan, W. A.**—Rolla, N. Dak. Garage.
- Dunham, M. H.**—Great Barrington, Mass. Garage.
- Duvall, W. T.**—1319 L St., N. W., Washington, D. C. Garage.
- Dyckman's Garage.**—Harper St., Stamford, Conn. Garage.

E

- Eagle Garage & Machine Co.**—1907-11 Cropsy St., Brooklyn, N. Y. Garage.
- Eagle, J. H. & C. K.**—Arch St., Shamokin, Pa. Garage.
- Easland, John N.**—Main St., near Berkeley Inn, Great Barrington, Mass. Garage; repairs; supplies.
- Easton Auto Co.**—306 W. 52nd St., New York City. Garage.
- Eaton, A. A.**—116 Milwaukee St., Oconomowoc, Wis. Garage.
- Eaton, H. D.**—Farmingham, Mass. Garage.
- East Stroudsburg Auto Co.**—East Stroudsburg, Pa. Garage.
- Eaton & Son.**—Bucyrus, O. Garage.

GARAGES (Continued)

- Eckhoff, John.**—Anthony St., Waterbury, Conn. Garage.
- Edmunds & Jones Mfg. Co.**—313 Riopelle St., Detroit, Mich. Garage.
- Edstrom, A.**—1474 W. Madison St., Chicago, Ill. Garage.
- Edwards, Ralph.**—Malvern, Pa. Garage.
- Egan & Grinnell.**—Seabreeze, Fla. Garage.
- Ehlbert, Chas. A.**—Greenville, Miss. Garage.
- Eickemeyer & Osterheld.**—5 Nepperhan St., Yonkers, N. Y. Garage.
- Eidam, Adam.**—15 N. Wyoming St., Hazleton, Pa. Garage.
- Eilers & Kilesrath.**—241 W. 107th St., New York City. Garage.
- Elder & Co., G. B.**—Biloxi, Miss. Garage.
- Electric Cab Co.**—238 W. 50th St., New York City. Garage.
- Electric Charging Station.**—200 Pearl St., Buffalo, N. Y. Garage.
- Electric Vehicle Co.**—502 N. Broad St., Philadelphia, Pa. Garage.
- Electric Vehicle Co.**—Hartford, Conn. Garage.
- Electric Vehicle Co.**—134 W. 39th St., New York City. Garage; repairing. (Columbia.)
- Ellas, Charles A.**—Bath, N. Y. Garage.
- Ellis & Edwards.**—Rochester, Minn. Garage.
- Ellis J. C.**—210 Sawinaw Ave., Flint, Mich. Garage.
- Elmwood Garage.**—189 Cleveland Ave., Buffalo, N. Y. Garage.
- Embley & Co., W. W.**—614 Main St., Asbury Park, N. J. Garage.
- Embree Co., W. F.**—McGarry Bldg., Union & Washington Sts., Lynn, Mass. Garage.
- Emerson, F. M.**—118 William St., Manchester, N. H. Garage.
- Emery Co., G. J.**—Hubbard St., Fulton, N. Y. Garage.
- Empire State Motor Car Co.**—2148-50 Broadway, New York City. Garage; repairing. (Queen.)
- Endurance Motor Car Co.**—Motor Mart, New York City. Garage. (Rapid.)
- Engle, A.**—1103 Carson St., Pittsburg, Pa. Garage.
- Englewood Automobile Livery Co.**—639 W. 63rd St., Chicago, Ill. Garage.
- Ennes, J. M.**—Princeton, Ill. Garage.
- Enterprise Garage.**—316-320 Washington St., Easton, Pa. Garage.
- Erb, John.**—345 Bridge St., Phoenixville, Pa. Garage.
- Esswein, Sam A.**—24 W. Broad St., Columbus, Ohio. Garage.
- Euclid Auto Exchange & Livery.**—5017 Euclid Ave., Cleveland, O. Garage.
- Eureka Auto Agency.**—2285 8th Ave., New York City. Garage.

GARAGES (Continued)

- Evans Automobile Co.**—63 Fay St., Columbus, Ohio. Garage.
Everest, J. H.—Lee Bldg., Oklahoma City, Okla. Garage.
Excelsior Auto Co.—133 W. 32nd St., New York City. Garage.
Excelsior Auto Repair Station.—3925 Michigan Ave., Chicago, Ill. Garage.
Ezell Automobile Co.—Nashville, Tenn. Garage.

F

- Fairbanks, Grant Mfg. Co.**—100 Albany St. Ithaca, N. Y. Garage.
Fairchild, Frank.—Sherburne, N. Y. Garage.
Fairchild, H. Coulson.—Passaic, N. J. Garage.
Fake, Ed. D.—18 E. Clark St., Ilion, N. Y. Garage.
Fargo Auto Brokerage & Garage Co.—302 Broadway, Fargo, N. Dak. Garage.
Farry, A. J. G.—216 W. Main St., Madison, Ind. Garage.
Fashion Auto Station.—4612 Cottage Grove St., Chicago, Ill. Garage.
Fawcett, C. E.—119-121 3rd Ave., Cedar Rapids, Iowa. Garage; repairs; supplies. (National.)
Fay & Scott.—Dexter, Me. Garage; repairing. (Reo, Maxwell.)
Fayette Automobile Co., E.—76 E. Fayette St., Uniontown, Pa. Garage; repairing. (White, Peerless, Reo, Holman.)
Felker Auto Co.—1535 Tremont St., Denver, Colo. Garage; repairing. (Stevens-Duryea, Peerless, Waltham, Pope-Waverley.)
Fellows & Fay.—126 Central Ave., Dunkirk, N. Y. Garage.
Fellwock Automobile & Mfg. Co.—320-322 Upper 4th St., Evansville, Ind. Garage; repairing. (Maxwell, Mitchell, Stoddard-Dayton, National, Baker, Ford.)
Ferrell, A. M.—Everett, Wash. Garage. (Mason, Ford, National.)
Fieldhouse, J. W.—Elkhart, Ind. Garage.
Fifth Avenue Garage.—45 W. 44th St., New York City. Garage.
Fifty-first Street Auto Station.—51st St. & Beaumont Ave., Philadelphia, Pa. Garage.
Fifty-third Street Auto Co.—87 E. 53rd St., Chicago, Ill. Garage.
Findlay Motor Car Co., The.—301 W. Cranford St., Findlay, O. Garage.
Fire-Proof Garage.—170th St. & Jerome Ave., New York City. Garage.
Fire-Proof Garage, The.—1061-62 Main St., North Adams, Mass. Garage; repairs; supplies.
Fisher, A.—310 Fort St., W., Detroit, Mich. Garage.

GARAGES (Continued).

- Fisher Auto Co.**—330 Illinois Ave., Indianapolis, Ind. Garage; repairing. (National, Stoddard-Dayton, Mitchell, Maxwell.)
Fisher Auto Storage Co.—219 Ferry St., Easton, Pa. Garage.
Fitchburg Auto School & Garage Co.—841 Elm St., Manchester, N. H. Garage.
Fitchburg Auto Transit Co.—Fitchburg, Mass. Garage.
Fixit Shop.—Moyer St., Canajoharie, N. Y. Garage; repairing.
Flagler Company.—Brooklyn, N. Y. Garage.
Flatbush Motor Car Co.—Snyder & Bedford Ave., Brooklyn, N. Y. Garage; repairing. (Corbin, Columbus.)
Flatrock Automobile Co.—Flatrock, Ind. Garage; repairing.
Flewelin, M. C.—Mendon, Mich. Garage.
Flick, W. C.—Ransom, Ill. Garage.
Flint Garage Co.—402 N. Saginaw St., Flint, Mich. Garage.
Flushing Auto Garage.—107 Broadway, Flushing, N. Y. Garage; repairing.
Flutcher, Joe T.—Gadsden Garage, Gadsden, Ala. Garage. (Cadillac.)
Flynn, Walter F.—110 Market St., Youngstown, Ohio. Garage.
Foley, J. C.—Jerome Ave. and 162d St., New York City. Garage.
Fort Motor Co. of Canada, Ltd.—Walkerville, Ontario, Canada. Garage.
Forest & Monk.—115 Central Ave., Great Falls, Mont. Garage.
Forest Auto Co.—St. Louis, Mo. Garage. (Oldsmobile.)
Forsyth & Davis.—777 Broadway, Kingston, N. Y. Garage; repairing.
Fort Pitt Automobile Co.—Baum St. & Euclid Ave., Pittsburgh, Pa. Garage; repairing. (Stearns, Locomobile, Oldsmobile.)
Foss Hughes Motor Car Co.—221 N. Broad St., Philadelphia, Pa. Garage; repairing; electric charging. (Pierce Arrow, Cadillac, Knox, Baker.)
Fowler, Frank.—Springfield, Mass. Garage.
Fraleigh Bros.—W. Market St., Rhinebeck, N. Y. Garage.
Franco-American Automobile Co.—417 Guy St., Montreal, Canada. Garage.
Franklin Garage.—347 ... St., ... falo, N. Y. Garage.
Franklin Garage.—Harttor age.
Franklin, Judge.—Norw age.
Franklin Mfg. Co., H. n.—St., Syracuse, N. Y. Garage lin.)
Freed & Bamford Auto Co.—City, Utah. Garage.

GARAGES (Continued)

Fritz, J. S.—Cambridge, Ohio. Garage; repairing.
Frontier Automobile Service Co.—437 Pearl St., Buffalo, N. Y. Garage.
Fuhrman & Schmidt.—Commerce St., Shamokin, Pa. Garage.
Fuller, E. D.—St. Albans, Vt. Garage.
Fulton Automobile Co.—103 N. Pryor St., Atlanta, Ga. Garage.
Fulton Street Garage Co.—Toledo, Ohio. Garage.
Fulton, Thomas.—Washingtonville, N. Y. Garage.
Furbish, Fred A.—2834 River St., Rumford Falls, Me. Garage.
Futer, B. Franklin.—213 N. Duke St., Lancaster, Pa. Garage; repairing. (Acme, Maxwell.)

G

Gaillard's Auto Repair Station.—265 Havemeyer St., Brooklyn, N. Y. Garage.
Gainsville Automobile Co.—Gainsville, Fla. Garage.
Gaiser's Garage.—103 Main St., Niagara Falls, N. Y. Garage.
Gallia Electric Co.—43 E. 52nd St., New York. Garage.
Garage Anglo-Mexicano.—Calle de Providencia, Mexico City, Mexico. Garage.
Gardiner Garage, Arthur.—S. E. Cor. Wisconsin & Exchange St., Kenosha, Wis. Garage.
Garfield Automobile Co.—1199 Garfield Blvd., Chicago, Ill. Garage.
Gates, Geo. W.—35 Aren St., Hartford, Conn. Garage.
Gauger, Grant.—229 Court St., Kankakee, Ill. Garage.
Gem City Automobile Co.—114 N. 7th St., Quincy, Ill. Garage.
Gemehl, Camile.—1406 Chancellor St., Philadelphia, Pa. Garage.
Gem Cycle Exchange.—73 Borden Ave., Long Island City, N. Y. Garage.
Geneva Automobile Company.—145 Castle St., Geneva, N. Y. Garage; repairing; supplies. (Cadillac.)
Germantown Garage.—6225 Germantown Ave., Philadelphia, Pa. Garage.
Gerome, T. F.—130-132 W. 18th St., New York City. Garage; repairing.
Gerrard, C. L.—Columbus, Neb. Garage.
Gibson, John I.—401 Franklin St., Buffalo, N. H. Garage.
Gibson Co.—Greene and Columbia St., N. Y. Garage.
Gibson, Miller.—Santa Monica, Westtown, Pa. Garage.
Gibson Auto Co.—18 Sabin St., Westtown, Pa. Garage.
Gibson, R. I. Garage.
Gibson, C. C.—866 Clay St., Dubuque, Iowa. Garage.

GARAGES (Continued)

Gordon Jewelry Co.—Shreveport, La. Garage.
Gosseline, Frank J.—Nahant, Mass. Garage.
Graham & Smith.—Flint, Mich. Garage.
Graham Automobile Co.—601-605 W. Madison St., Chicago, Ill. Garage.
Gramatan Garage.—Bronxville, N. Y. Garage.
Granagan, P. J.—Jackson St., Sandusky, Ohio. Garage; repairs. (Ford.)
Grand Auto Station.—204 E. 35th St., Chicago, Ill. Garage.
Grant, N. L.—206 Melrose St., Auburn-dale, Mass. Garage.
Grant Square Automobile Co.—1380 Bedford Ave., Brooklyn, N. Y. Garage.
Graves, J. H.—836 W. Division St., Chicago, Ill. Garage.
Graves, T. A.—Caven St., Ligonier, Ind. Garage.
Greene & Warnick.—Stewart Street, Amsterdam, N. Y. Garage; repairs; supplies. (Pope-Toledo, Stevens-Dur-yea.)
Greene, G. M.—King City, Mo. Garage.
Greene, Will C.—91 Washington St., Watertown, N. Y. Garage.
Greenfield Automobile Co.—21 Federal St., Greenfield, Mass. Garage; repairs; supplies. (Rambler, Ford.)
Greenwalt, H. F.—823 N. Carlisle St., Philadelphia, Pa. Garage.
Greenwich Automobile Station.—Cor. Greenwich & Boston Post Road, Greenwich, Conn. Garage; repairs.
Greenwood Auto Garage.—197 E. 47th St., Chicago, Ill. Garage.
Greer, Erwin.—1446 Indiana Ave., Chicago, Ill. Garage.
Greer-Robbins Co.—1501 Main St., S. Los Angeles, Cal. Garage. (Mitchell.)
Grieger, L.—Plainview, Minn. Garage.
Griggs Automobile & Bicycle Co.—418 Santa Fe Ave., Pueblo, Colo. Garage.
Grimes & Harris.—92 Pleasant St., Leominster, Mass. Garage.
Gross, Terrance, Garage.—Rear 1396 Madison St., Chicago, Ill. Garage; repairing; supplies.
Groves, H. B.—Garner, Iowa. Garage.
Groves, H. B.—Webster City, Iowa. Garage.
Grow Auto Garage & Machine Shop.—300 F St., Marysville, Col. Garage; repairing. (Oldsmobile, Winton.)
Gudger & Ewing.—Stockton, Kan. Garage.
Guenther, E. P.—High & Blvd., West Hoboken, N. J. Garage.
Gulstine & Waskey.—Madison, S. Dak. Garage; repairing. (Buick.)
Gurnee, B. S.—Hanford, Cal. Garage; repairing. (Ford, Buick, Auburn, Reo.)

GARAGES (Continued)

Guyon, H. A.—62 Broad St., Red Bank, N. J. Garage.

H

- Hackensack Auto Co.**—Main St., Hackensack, N. J. Garage; repairing. (Maxwell.)
- Hackett Motor Car Co.**—218 Paterson St., Paterson, N. J. Garage; repairing. (Manhattan Trucks.)
- Hadley, Henry.**—Gardner, Mass. Garage.
- Hadlock, W. Y.**—15 N. Main St., Manchester, N. H. Garage; repairs; supplies. (Rambler, Queen.)
- Hahn, H. J.**—St. Charles, Ill. Garage.
- Haines, W. B.**—804 E. Market St., Sunbury, Pa. Garage.
- Hale, Ralph.**—Willett & Crouse Sts., Fort Plain, N. Y. Garage.
- Hal, E. G.**—111 E. Broadway, Brownwood, Tex. Garage; repairing. (Cadillac.)
- Halliday Co., The.**—Streator, Ill. Garage.
- Ham & Ross.**—23 S. College St., Charlotte, N. C. Garage; repairing. (Maxwell.)
- Hamilton Auto Co.**—221 Eagle St., Dunkirk, N. Y. Garage.
- Hamilton Garage Co.**—133-135 King St., West Hamilton, Canada. Garage; repairing. (Oldsmobile, Franklin, Maxwell.)
- Hamilton Motor Car Co.**—26 N. 2nd St., Hamilton, Ohio. Garage; repairing. (Buick, Elmore.)
- Hancock, W. C.**—Concord, Mass. Garage.
- Handy, Robert.**—W. Middle St., Bay City, Mich. Garage.
- Hannan & Henry Motor Co.**—29-31 Catherine St., Ogdensburg, N. Y. Garage; repairing. (Cadillac, Buick.)
- Harder's Gun Works.**—Clearfield, Pa. Garage; repairing. (Waltham, Thomas, Buick, Franklin, Cadillac, Pope-Waverley.)
- Harding, Geo. S.**—1401 Michigan Ave., Chicago, Ill. Garage.
- Hardy Automobile Co., C. H.**—529 2nd St., Allegheny, Pa. Garage.
- Harlem Automobile Co.**—159 W. 127th St., New York City. Garage.
- Harmon, S. F.**—Tacoma, Wash. Garage.
- Harper, D. Walter.**—Philadelphia, Pa. Garage.
- Harper Garage Co.**—Salem, Mass. Garage.
- Harrell, Geo. H.**—685 Chapel St., New Haven, Conn. Garage.
- Harrington Garage.**—Worcester, Mass. Garage; supplies.
- Harris & Wilson.**—326 Main St., Niagara Falls, N. Y. Garage.
- Harris Bros. Co.**—O'Reilly 104, Havana, Cuba. Garage.

GARAGES (Continued)

- Harrisburg Auto Co.**—3rd St. & Hamilton Ave., Harrisburg, Pa. Garage; repairing. (Stanley, Reo, Rambler, Logan, National, Babcock.)
- Harrison, O.**—Washington St., Woodstock, Ill. Garage.
- Harrison Auto Co.**—212 Union St., Providence, R. I. Garage.
- Hartford Suspension Co.**—67 Vestry & 212 W. 88th St., New York City. Garage; repairing. (Gobron-Brillé.)
- Hartigan, F. L.**—5206 Lake Ave., Chicago, Ill. Garage.
- Hartog, A.**—303 W. 54th St., New York City. Garage.
- Hartz, M. M.**—23rd & Spring Garden St., Philadelphia, Pa. Garage.
- Harvard Automobile Co.**—1230 Massachusetts Ave., Cambridge, Mass. Garage.
- Harvard Marine & Auto Co.**—25 Eliot St., Cambridge, Mass. Garage.
- Hassell Wagon & Harness Co.**—Broadway & Hudson Ave., Albany, N. Y. Garage.
- Hastings Imp. Co.**—Hastings, Neb. Garage.
- Hathorn Auto Co.**—Cor. 5th & Washington Sts., Mason City, Iowa. Garage; repairing. (Winton, Cadillac, Northern, Buick, White.)
- Havana Garage Co.**—Zuleta 28, Havana, Cuba. Garage.
- Haverstraw Garage, The.**—Haverstraw, N. Y.
- Hawkinson, O.**—Maynard, Minn. Garage; repairing. (Waltham.)
- Hawley, Wm. J.**—227 S. Main St., Canandaigua, N. Y. Garage.
- Hayes, C. F.**—Riverton, Iowa. Garage.
- Haynes, A. R. & L. B.**—144 N. Washington St., Rome, N. Y. Garage.
- Haynes Automobile Co.**—317 Robert St., St. Paul, Minn. Garage.
- Haythorn, J. W.**—Richmond, Ill. Garage.
- Heath, C. H.**—Fort Dodge, Iowa. Garage.
- Heck, Chas.**—Nashville, Tenn. Garage.
- Heck, H. A.**—119 Main St., Spring City, Pa. Garage.
- Heckler, T. C.**—222 Penn St., Reading, Pa. Garage.
- Hedges Cycle Co.**—Main St., Foxboro, Mass. Garage.
- Hedges, W. H.**—Wainsco " " " " Garage.
- Hege Co., Oscar F.**—317 Ma-
ston Salem, N. C. Garage
(Cadillac.)
- Hein & Casper.**—501 Broad-
kee, Wis. Garage.
- Helligrass, H. M.**—Locust St.,
bia, Pa. Garage.
- Henderson Bros.**—Woodward A-
troit, Mich. Garage.

GARAGES (Continued)

- Henkel Bros.**—Brattleboro, Vt. Garage.
Henkelman, Chas. E.—1724-26 Atlantic Ave., Atlantic City, N. J. Garage; repairing.
Henke, W. O.—Greenwood Ave., Montclair, N. J. Garage.
Henne Co., Louis.—New Braumfield, Tex. Garage.
Henry, Walter M.—162 S. Main St., Canandaigua, N. Y. Garage.
Herkimer Motor Car Co.—124-126 Albany St., Herkimer, N. Y. Garage; repairs; supplies. (Maxwell.)
Hess Automobile Co.—701 Quincy St., Brooklyn, N. Y. Garage.
Hessel's Garage, E. S.—15 Brookfield St., White Plains, N. Y. Garage; supplies.
Hewitt Motor Co.—6 E. 31st St., New York City. Garage.
Hickman Automobile Co.—Attica, Ind. Garage.
Higgins, C. C.—Woodmere, N. Y. Garage.
Highland Park Auto Station.—Cor Park and St. John's Aves., Highland Park, Ill. Garage.
Hiland Automobile Co.—5811-17 Center Ave., Pittsburg, Pa. Garage; repairing. (Peerless, Buick.)
Hildreth, P.—Franklin, Neb. Garage.
Hill Auto Co.—Dallas, Tex. Garage.
Hill, C. F.—327 Ferry St., Easton, Pa. Garage.
Hill, F. R.—Greentown, Ind. Garage.
Hill Motor Car Co.—Haverhill, Mass. Garage.
Hilton Machine Works.—16 E. 3rd St., Dunkirk, N. Y. Garage.
Himes-Eden Auto Co.—115 W. Maryland St., Indianapolis, Ind. Garage.
Hobbie & Martin.—244 S. Chambers St., Galesburg, Ill. Garage.
Hobron, T. W.—Honolulu, Hawaiian Islands. Garage.
Hodges, H. B.—San Juan, Porto Rico. Garage.
Hodgkins, W.—9 Western Ave., Gloucester, Mass. Garage.
Hoff, Albert.—15 Germania St., Chicago, Ill. Garage.
Hoff, Jos. B.—106-118 Main St., Lakewood, N. J. Garage; repairing. (American Mercedes, Locomobile, Pope-Waverley, Columbia.)
an & Setzer Auto Station.—1918 me Ave., New York City. Garage.
Stahl Motor Co.—398 Bedford Ave.,oklyn, N. Y. Garage.
omb Company.—105 Goffe St., New en, Conn. Garage; repairs. (Bab, Cadillac, Franklin.)
nd, W. P.—Clarksdale, Miss. Gar-
n, John S.—Smithtown Branch, N. Y. Garage.

GARAGES (Continued)

- Honeter, Roy.**—117 W. Main St., Brazil, Ind. Garage.
Hoppenyon Auto Co., The.—301 2nd St., E., Ashland, Wis. Garage; repairing. (Ford, Reo.)
Haupt Co., Harry S.—1896 Broadway, New York City. Garage; repairing. (Thomas.)
Haupt Co., Harry S.—139 S. Broad St., Philadelphia, Pa. Garage; repairing. (Thomas.)
Houser, Orville.—101 N. Mulberry St., Chillicothe, Ohio. Garage.
Houston Motor Car Co.—417 San Jacinto St., Houston, Tex. Garage; repairing. (Thomas, Stevens-Duryea, Cadillac.)
Howard Automobile Station.—Howard Ave., Boston, Mass. Garage.
Howard, Case & Co.—Lephbridge, Alta. Canada. Garage.
Howard, J. S.—S. Los Angeles St., Anaheim, Cal. Garage.
Howe Motor Car Co.—11 Park Ave., Paterson, N. J. Garage; repairing. (Reo, Premier.)
Hub Auto Exchange.—195 Freeport St., Boston, Mass. Garage.
Huff, Ed.—Watertown, S. Dak. Garage.
Humboldt, Geo. E.—1246 Argyle Ave., Chicago, Ill. Garage.
Hump Motor Garage.—2532-34 N. Broad St., Philadelphia, Pa. Garage.
Hunt Automobile Co.—522 7th St., San Diego, Cal. Garage.
Hunter, F. S.—Ashland, Ohio. Garage.
Hyde Park Garage.—5208 Lake Ave., Chicago, Ill. Garage.
Hylton, Geo.—182½ Bedford Ave., Brooklyn, N. Y. Garage.

I

- Ideal Auto Garage.**—862 Jefferson Ave., Brooklyn, N. Y. Garage.
Illinois Auto Mfg. & Garage Co.—Springfield, Ill. Garage.
Imperial Auto Station.—52 W. 67th St., New York City. Garage.
Imperial Garage, The.—52-54 W. 67th St., New York City. Garage.
Imperial Garage Co.—Mound St., Columbus, Ohio. Garage.
Imperial Motor Co.—1904 Main St., Brf-falo, N. Y. Garage. (Buick, Packard, Pope-Hartford, Pope-Waverley.)
Ingalls Garage Co.—State St., Newburyport, Mass. Garage; repairs; supplies.
Iowa Brass & Novelty Works.—117 Grand Ave., Des Moines, Iowa. Garage.
Iron City Auto Co.—613 5th Ave., Pittsburg, Pa. Garage.
Irving Auto Station.—128 E. 29th St., New York City. Garage.
Israel, Abe.—139 Broadway, Paterson, N. J. Garage.

GARAGES (Continued)

Ivery Realty Co.—Montgomery, Ala. Garage.

J

Jackson Motor Car Co.—103 Court St., Brooklyn, N. Y. Garage; repairs. (Jackson.)

Jackson Park Auto Garage.—6430 Jackson Park, Chicago, Ill. Garage.

Jamestown Iron Works Co.—Jamestown, N. Y. Garage; repairs.

Jansen & Huestis.—Fonda, N. Y. Garage.

Jencick Motor Mfg. Co.—N. Main St., Port Chester, N. Y. Garage.

Jensen Auto Co.—206 W. 65th St., New York City. Garage.

Jewett City Auto Station.—Jewett City, Conn. Garage.

Jewett's Garage.—58 Pleasant Street, Claremont, N. H. Garage; repairing; supplies. (Rambler, Maxwell.)

Johns & Armatout.—Fitzgerald, Ga. Garage.

Johnson Carriage Co.—Forest St. and East Ave., New Canaan, Conn. Garage; supplies; repairing.

Johnson, D. E.—Ambler, Pa. Garage.

Johnson, Fred. L.—86 N. Main St., Concord, N. H. Garage.

Johnson Garage.—Wisconsin & Blunt St., Charles City, Iowa. Garage.

Johnson, Itheul M.—Main St., Corning, N. Y. Garage.

Johnson & Son, Geo. E.—Chestnut St., New Paltz, N. Y. Garage. (Jackson, Ford.)

Jones Cycle & Automobile Co.—132 E. Main St., Portland, Ind. Garage.

Jones, E. E.—9-11 Tremont St., N. Tonawanda, N. Y. Garage.

Jones, Henry P.—31 Waeman Ave., Newark, N. J. Garage.

Jorgensen, Chris.—Holdredge, Neb. Garage.

Joy Bros.—187 E. 6th St., Minneapolis, Minn. Garage.

June Bros.—Garrison St., Fremont, O. Garage.

K

Kavanaugh, Fred W.—Troy, N. Y. Garage.

Kay Cycle Co., Alexander.—320 Queen St., Toronto, Canada. Garage.

Keating Garage Co.—145 W. 2nd St., Oswego, N. Y. Garage; repairs; supplies.

Keefe, J. C.—133 Main St., Herkimer, N. Y. Garage.

Keefer, Wm. N.—88 E. Main St., Westminster, Md. Garage.

Keeney, E. P.—Boulevard & Cottage St., Jersey City, N. J. Garage.

Keet, N. W.—Northfield, Mass. Garage.

GARAGES (Continued)

Kehoe Company, The E. J.—1659 Broadway, New York City. Garage; repairing. (Continental.)

Keller, J. M.—Nappanee, Ind. Garage.

Kellogg Garage Co.—Kellogg, Iowa. Garage.

Kelly, J. H.—Natchez, Miss. Garage.

Kelsey Co.—42 Niagara St., Buffalo, N. Y. Garage.

Kemp Machine Works, J. M.—887 Main St., Albany, N. Y. Garage.

Kensington Garage.—712-714 Coney Island Ave., near Ave. D, Brooklyn, N. Y. Garage; renting; repairing; supplies.

Kentucky Automobile Co.—1051 3rd Ave., Louisville, Ky. Garage; repairing. (Cadillac, Peerless, Knox, Buick, Pope-Waverley.)

Kerberg & Protexter.—Sandborn, Iowa. Garage.

Kern & Son.—Portland, N. Dak. Garage.

Kerr, I. N.—Main & Asbury Ave., Asbury Park, N. J. Garage.

Ketchum & Co.—Bank & Spark Sts., Ottawa, Canada. Garage; repairing. (Oldsmobile, Ford.)

Ketchum, J. P.—60 Putnam St., Saratoga, N. Y. Garage. (Packard, Cadillac.)

Keystone Garage.—912 Bedford Ave., Brooklyn, N. Y. Garage.

Khesrath, V.—588 Fordham Road., New York City. Garage.

Kidder, H. F.—Elkhart, Ind. Garage.

Kid McCoy Motor Co.—60 W. 43d St., New York City. Garage.

Killian's Garage.—Tompkinsville, N. Y. Garage.

King's Bench Garage.—Swampscott, Mass. Garage.

Kingsbury, John.—133 Hudson Ave., Albany, N. Y. Garage.

Kings County Automobile Co.—1011 Greene Ave., Brooklyn, N. Y. Garage.

Kingston Garage & Motor Car Co.—Kingston, Pa. Garage.

Kinsey & Dobbins.—Highlands, N. J. Garage.

Kinsey & Dobbins.—129 Riverside Ave., Newark, N. J. Garage.

Kinsley Auto Co.—Kinsley, Kan. Garage.

Klickler, Frank.—Bath, N. Y. Garage.

Knaft, W. M.—Coshoct age.

Knickerbocker Auto Co.—St., New York City. Garage

Knickerbocker Garage.—Hot N. Y. Garage.

Knowalsky, J.—Verona, Pa.

Koehler Co., H. J.—1709 1 York City. Garage.

Koehler Sporting Goods.—field Ave., Montclair, N. J. Garage

GARAGES (Continued)

- Koenig Bros.**—Broadway, bet. Central Ave. & Main St., Tarrytown, N. Y. Garage; repairs; supplies. (Reo, Premier.)
Kokomo Auto & Machine Co.—44 W. Mulberry St., Kokomo, Ind. Garage.
Kraemer, C.—758 E. 140th St., New York City. Garage.
Kramrath, H.—25 Plain St., Albany, N. Y. Garage.
Kratzer, Wayne.—1172 5th Ave., New York City. Garage.
Kuhlmann, Wm.—Boerne, Tex. Garage.
Kunkle & Co., E.—Garfield, N. J. Garage.
Kutzkau, H. T.—Tonopah, Nev. Garage; Repairing. (Simplex, Isotta-Fraschini, Thomas, Oldsmobile.)

L

- Ladewig & Stock Co.**—277 Madison St., Waukesha, Wis. Garage; repairing.
La Grange Machine Works.—La Grange, Ind. Garage.
Lake Forest Automobile & Machine Co.—Lake Forest, Ill. Garage.
Lake Shore Auto Station.—520 Dearborn Ave., Chicago, Ill. Garage.
Lake View Auto Station.—55 Evanston Ave., Chicago, Ill. Garage.
Lakewood Auto Garage.—106 Main St., Lakewood, N. J. Garage.
Lambert & Van Tack.—16 N. Franklin St., Titusville, Pa. Garage; repairing. (Pierce Arrow, Stevens-Duryea, Buick.)
Lambert, W. S.—724 W. 8th St., Anderson, Ind. Garage.
Land, H. L.—Suffolk, Va. Garage.
Landis, Eberhardt.—Tiffin, Ohio. Garage.
Lane, Louis L.—Broadway, nr. Pine St., Seattle, Wash. Garage.
Langstaff Machine Works.—65 Maple St., Chicago, Ill. Garage.
Larimer, W. G.—5969 Center Ave., Pittsburgh, Pa. Garage.
Lassen, C. F.—Cedar Lake, Ind. Garage.
Lawrence Motor Car Co.—13-17 W. Warren St., Lawrence, Kan. Garage; repairing. (Ford.)
Lawson's Garage.—810-816 South St., Peekskill, N. Y. Garage; repairs; supplies. (Cadillac, Pope-Hartford, Pope-Toledo.)
Leff, Co.—24 Water St., Turn, N. Y. Garage.
Leff, Simeon.—4711 Forestville Ave., Chicago, Ill. Garage.
Leff, D.—201 2nd St., S. E., Washon. D. C., Garage.
Leff, San Bernardino, Cal.
 Ave. & Mulberry St.,
 Point, Cal. Garage.
Leff, Thomas.—Outlet Rock, New Brunswick, N. J. Garage.

GARAGES (Continued)

- Lemont, B. A.**—Bretten Woods, N. H. Garage.
Lenox Auto Co.—60 W. 116th St., New York City. Garage.
Leonard, H. M.—625 W. Broad St., Elyria, Ohio. Garage; repairs; supplies. (Jackson.)
Letcher Auto Co.—1st & St. James Sts., San Jose, Cal. Garage.
Lewis Auto Co.—Lewis Ave. & Hancock St., Brooklyn, N. Y. Garage.
Lewis, Fred R.—Pomona, Cal. Garage.
Lewis, I. M.—Conneaut, Pa. Garage.
Lewiston Auto Exchange.—Lewiston, Me. Garage.
Lexington Garage.—135 E. 40th St., New York City. Garage.
Light, Oliver.—280 St. Nicholas Ave., New York City. Garage.
Lincoln Carriage Auto Co.—216 W. 50th St., New York City. Garage.
Lincoln Park Auto Station.—Rear 1071 N. Clark St., Chicago, Ill. Garage.
Lipsey & Co., H. H.—3843 Grand Blvd., Chicago, Ill. Garage.
Lisk & Petry.—405-407 Diamond St., Hudson, N. Y. Garage; repairs; supplies. (Stevens-Duryea, Thomas, Cadillac.)
Lock Auto Co.—3rd & Adams Sts., Evansville, Ind. Garage.
Lockwood & Co., F. E.—39 Wall St., Norwalk, Conn. Garage; repairing; supplies. (Locomobile, Waltham, Autocar, Elmore, White.)
Lockwood Bros.—103-109 W. Pearl St., Jackson, Mich. Garage; supplies. (Jackson, Pope-Toledo.)
Locomobile Co.—400 Newbury St., Boston, Mass. Garage; repairing. (Locomobile.)
Logan Construction Co. Garage.—Chillicothe, Ohio. Garage.
Logan Cycle Co.—320 Main St., Salinas, Cal. Garage.
Lohlein, Jos.—Laramie, Wyo. Garage.
Long Acre Auto Depot.—507 W. 44th St., New York City. Garage.
Long Island City Auto Garage Co.—East Ave., cor. 8th St., Long Island City, L. I. Garage.
Long Island Garage Co.—159 Reid Ave., Brooklyn, N. Y. Garage.
Long Island Garage Co.—Glen Cove, L. I. Garage.
Long, L. Y.—524 Madison Ave., Albany, N. Y. Garage.
Lothrop-Davis Co.—Tonopah, Nev. Garage; repairing.
Louis, O.—19 S. Water St., Ogdensburg, N. Y. Garage.
Lowell Automobile Co.—Appleton St. & Post Office Ave., Lowell, Mass. Garage; repairing; supplies. (Stevens-Duryea, Cadillac, Pope-Hartford, Stanley.)

GARAGES (Continued)

- Lowe's Auto Garage.**—Pine & Morris Sts., Morristown, N. J. Garage.
Lowe Garage, S. C.—22 Fourth St., New Bedford, Mass. Garage; repairing. (Locomobile, Oldsmobile, Franklin.)
Lowe, Philip A.—103 North St., Pittsfield, Mass. Garage.
Low, F. E.—Steubenville, Ohio. Garage.
Lucas & Christenson.—2002 Euclid Ave., Cleveland, O. Garage. (Mitchell.)
Lucey Motor Car Co.—231-233 River St., Troy, N. Y. Garage. (Stoddard-Dayton.)
Lumund, Jos.—11 Union Ave., Rutherford, N. J. Garage.
Lurie's Automobile Deport.—287 Morris Ave., New York City. Garage.
Luverne Automobile Co.—Luverne, Minn. Garage.

M

- Mackkeller, Henry.**—Overbrook, Pa. Garage.
Madison Square Garage.—231 E. 33rd St., New York City. Garage.
Magoon Motor Co., R. H.—2174-80 9th St., S. E., Cleveland, Ohio. Garage; repairs; supplies. (Pope-Toledo.)
Maher Garage Co.—120-122 W. 22d St., Toledo, O. Garage.
Maine Motor Carriage Co.—Cor. Free & South Sts., Portland, Me. Garage; repairs; supplies. (Haynes, Pope-Hartford, Stevens-Duryea.)
Malden Automobile Co.—121 Madison St., Malden, Mass. Garage.
Mallison, J. M.—62 Johns St., Utica, N. Y. Garage.
Maltby, D. F.—Westbury, N. Y. Garage.
Mammoth Garage Co.—Mamaroneck Ave. and Post Rd., White Plains, N. Y. Garage.
Manchester Auto Machine Co., Ltd.—1516 Locust Ave., Allegheny, Pa. Garage.
Manecke, H. R.—Decatur, Ill. Garage.
Manhattan Storage Co.—334 W. 44th St., New York City. Garage.
Manufacturers Motor Car Co.—54 W. 43rd St., New York City. Garage.
Marble Auto Garage, W. H.—69 Main St., Brockton, Mass. Garage; repairing; supplies. (Columbia, Locomobile, Cadillac, Knox, Winton.)
Marlborough Street Auto Exchange.—6 Marlborough St., Newport, R. I. Garage.
Marshall, Edw.—1221 Baltimore Ave., Kansas City, Mo. Garage.
Martin Automobile Co., F. L. C.—3204 Park Ave., Plainfield, N. J. Garage; repairing. (Thomas Flyer, Franklin, Mercedes, Clement-Bayard, Stevens-Duryea.)
Martyn's Auto Repair Station, D. J.—53 E. 124th St., New York City. Garage.

GARAGES (Continued)

- Massachusetts Auto Co.**—53 Church St., Boston, Mass. Garage.
Mayo & Lindeman.—92 Ward St., Waterbury, Conn. Garage.
Maye, C. E.—Red Lion, Pa. Garage.
Mayer & Eachus.—109 Market St., West Chester, Pa. Garage.
McCalmont, A. W.—Sioux Falls, S. Dak. Garage.
McCann, J. N.—Eau Claire, Wis. Garage.
McCartin, Geo. S.—Watertown, N. Y. Garage.
McConkey, Frank.—Canajoharie, N. Y. Garage.
McCook Auto Co.—308 W. Denison St., McCook, Neb. Garage; repairing. (Mason.)
McCord, Don C.—Oakland, Cal. Garage.
McCullough & Son, J. H.—219 N. Broad St., Philadelphia, Pa. Garage.
McDonald, Hugh.—Valley City, N. Dak. Garage.
McDonald, J. B.—Jacksonville, Fla. Garage.
McElroy, T.—139 Walnut St., Newark, N. J. Garage.
McEwans & Dougherty.—Park River, N. Dak. Garage.
McGaughy, H. G.—1345 Wabash Ave., Chicago, Ill. Garage.
McIntosh, J. B., Auto Co.—199 Jefferson Ave., Detroit, Mich. Garage.
McIntosh Auto Garage.—130 W. 102nd St., New York City. Garage.
McIntyre & Bros., E. L.—114 Jefferson St., Savannah, Ga. Garage.
McIntire-Willets Mfg. Co.—Monroe & Cunningham Sts., Butler, Pa. Garage.
McKay, D.—San Antonio, Tex. Garage.
McKay, R. E.—Omaha, Neb. Garage.
McKinley Square Auto Co.—1369 Boston Road, New York City. Garage.
McLellan, A. T.—511 Colorado St., Austin, Tex. Garage.
Mechaley Auto Co.—30-40 Summer St., Stamford, Conn. Garage; supplies; repairing. (Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, White, Cadillac.)
Meenan & Studt.—Avenida Juarez, Mexico City, Mexico. Garage.
Merchant, B. D.—Central Ave., Alameda, Cal. Garage; repairing. (Pope, Ford, Franklin, Royal, Hewitt.)
Mercury Auto Co.—2119 N. Broad Philadelphia, Pa. Garage.
Meridan Auto & Cycle Co.—Miss. Garage.
Meriden Auto Station.—41 W. Meriden, Conn. Garage.
Metropolitan Automobile Co.—Stanhope St., Boston, Mass. Garage; repairs.

GARAGES (Continued)

- Meyer, Eugene.**—347 Amsterdam Ave., New York City. Garage.
Meyer, V. F.—520 Washington St., Hoboken, N. J. Garage.
Miami Automobile Co.—13th St., bet. Aves. D & E., Miami, Fla. Garage; repairing. (Locomobile, Reo.)
Miami Motor Car Co., The.—117 E. 2nd St., Dayton, Ohio. Garage; repairing. (Franklin, Haynes, Waltham.)
Miami Transfer Co.—11th St., bet. Aves. D & E., Miami, Fla. Garage.
Michaelis-Middlehauff Auto Co.—1650-1654 Glenarm St., Denver, Colo. Garage; repairing. (Queen.)
Michigan Auto Exchange.—Michigan Ave., Detroit, Mich. Garage.
Mick's Automobile Garage.—58 N. 2nd St., Camden, N. J. Garage.
Miller & Armstrong.—N. First St., Fulton, N. Y. Garage.
Miller Auto Co.—132 N. Cascade Ave., Colorado Springs, Colo. Garage.
Miller, B.—4036 Prairie Ave., Chicago, Ill. Garage.
Miller Bros.—Office, 7 Bay St.; Garage, 12 Maple St., Glens Falls, N. Y. Garage; repairs; supplies. (Buick.)
Miller Bros. Automobile Co.—1404 Meriden St., Anderson, Ind. Garage.
Miller, F. E.—440 Main St., Princeton, Ill. Garage.
Miller, H. C.—101 Prospect St., Brockton, Mass. Garage.
Miller, L. C.—227 Broad St., Waverley, N. Y. Garage.
Millers Sons, W. P.—75 Third St., Long Island City, N. Y. Garage.
Miller, S. W.—Martinsburg, Md. Garage.
Müller, William H.—Cor. 7th & Wisconsin Sts., Racine, Wis. Garage.
Millward & Cook.—208 W. 124th St., New York City. Garage.
Milne, Frank.—43 Columbus Ave., Boston, Mass. Garage.
Milton Co., Frank.—30 W. State St., Trenton, N. J. Garage.
Mineola Motor Car Co.—Mineola, N. Y. Garage.
Minot Machine Supply Co.—Minot, N. Dak. Garage.
Mission Garage.—757 W. 7th St., Riverside, Cal. Garage.
Missouri Valley Auto Co.—1112-1114 E. 15th St. & Troost Ave., Kansas City, Garage; repairing. (White.)
Motor & Machine Co.—Jane St., City, Mich. Garage.
tt Auto Co.—Lincoln, Neb. Garage.
l Garage Co.—645 E. 47th St., Chicago, Ill. Garage.
n Auto Co.—College St., Asheville, N. C. Garage.
k Machine Shop.—Main St., Fontana, N. Y. Garage.

GARAGES (Continued)

- Molter's Automobile Station.**—26 W. 65th St., New York City. Garage.
Monmcuth Garage.—Heck St. & Lake Ave., Asbury Park, N. J. Garage.
Monnot & Sacher.—Salesrooms and garage, 305 S. Market St., Canton, Ohio. Garage; repairing.
Monroe Garage.—202 Monroe St., Brooklyn, N. Y. Garage.
Monroe Garage Co.—Stroudsburg, Pa. Garage.
Monson Auto Co.—1466 Michigan Ave., Chicago, Ill. Garage.
Montague Automobile Co.—Chanute, Kan. Garage.
Montclair Auto Station.—Bloomfield, Ave. & Valley Road, Montclair, N. J. Garage.
Monumental Garage, The.—1002 Morton St., Baltimore, Md. Garage; repairing. (Pungs-Finch, Maxwell.)
Moore-Edenfield Electric & Mfg. Co.—1033 Broad St., Augusta, Ga. Garage; repairing. (Franklin, Cadillac.)
Moore, H. S.—1761 Crawford Road, Cleveland, Ohio. Garage; repairing. (Stoddard-Dayton.)
Mora Motor Car Co.—Newark, N. Y. Garage. (Mora.)
Morgan, W. E.—Joplin St., Joplin, Mo. Garage.
Moriarty & Co., E. P.—1612-14 Grand Ave., Kansas City, Mo. Garage; repairing. (Packard, Stevens-Duryea, Peerless, Knox.)
Morris, A.—Columbus Grove, Ohio. Garage; repairing. (Cadillac, Buick, Franklin.)
Morris Auto Garage.—Fulton St., cor. Merrick Road, Jamaica, N. Y. Garage; repairs; supplies.
Morris Motor Car Co.—Liberty St., Morris, Ill. Garage.
Morrison Bros.—310 Harrison St., Syracuse, N. Y. Garage.
Morrison, Robert.—Lisbon, Ohio. Garage.
Morse, E. W., Jr.—Sumter, S. C. Garage.
Morse, T. S.—Lenox, Mass. Garage. supplies; repairs.
Mosley-Haiger Electric Co.—308-310 Lee St., Montgomery, Ala. Garage.
Motley Auto Livery, C. W.—349 Michigan Ave., Chicago, Ill. Garage.
Motor Car Co. of New Jersey.—289-93 Halsey St., Newark, N. J. Garage; repairing; supplies; electric charging. (Autocar, Packard, Cadillac.)
Motor Car Livery.—1406 Chancellor St., Philadelphia, Pa. Garage.
Motor Car Maintenance Co.—247-49 W. 49th St., New York City. Garage; repairing.
Motor Car Specialty Co.—147 E. State St., Trenton, N. J. Garage.

GARAGES (Continued)

Motor Tallyho Co.—Asbury Park, N. J. Garage.
Motor Vehicle Co.—518 Broad St., Newark, N. J. Garage.
Motor Vehicle Co.—1841 Market St., San Francisco, Cal. Garage.
Motor Vehicle Repair & Storage Co.—121 W. 81st St., New York City. Garage.
Mt. Clemons Garage Co.—16 New St., Mt. Clemons, Mich. Garage.
Mt. Diablo Garage.—Cor. Fernando & Colfax Sts., Concord, Cal. Garage; repairing. (Rambler.)
Mt. Morris Auto Garage.—27 W. 124th St., New York City. Garage.
Mt. Pleasant Auto Station.—Roxborough, Mass. Garage.
Mt. Vernon Auto Station.—Prospect Ave., Mt. Vernon, N. Y. Garage.
Mulford, D. L.—1801 N. 21st St., Philadelphia, Pa. Garage.
Mulock's Belmont Garage.—13-15 South Carolina Ave., Atlantic City, N. J. Garage; repairing. (Wayne, Rambler, Pullman.)
Muncie Auto Parts Co.—210 N. Walnut St., Muncie, Ind. Garage.
Muncie Garage & Repair Co.—209 E. Adams St., Muncie, Ind. Garage.
Murill Mfg. Co.—Marion, Ind. Garage.
Murray Hill Auto Station.—27 E. 25th St., New York City. Garage.
Myers & Co., C. F.—126 6th St., Logansport, Ind. Garage.
Myers, S. C.—513 16th St., Oakland, Cal. Garage.

N

Nashville Motor Car Co.—Cor Church St. and 9th Ave., Nashville, Tenn. Garage; repairing. (Dorris, Stanley.)
National Battery Co.—368 Massachusetts St., Buffalo, N. Y. Garage.
National Garage.—Cor. 7th and Main Sts., Los Angeles, Cal. Garage.
National Motor Vehicle Co.—Cleveland, Ohio. Garage.
Nelson, Axel.—8th St., bet. Orange & Lemon Sts., Riverside, Cal. Garage.
Nettleton & Co., V. L.—21 Hanchett St., Coldwater, Mich. Garage; repairing. (Rambler, Maxwell.)
Nevada Automobile & Supply Co.—N. Main St., Goldfield, Nev. Office, 115 Ramsey St., Goldfield, Nev. Garage; repairing. (Pope-Toledo, Northern.)
Newark Repair & Garage Co.—213 Clinton Ave., Newark, N. J. Garage.
Newburgh Auto Shop, Youngs & Co., Inc.—249 Grand St., Newburgh, N. Y. Garage; repairs. (Winton.)
New Jersey Auto Car Co.—239 Halsey St., Newark, N. J. Garage.
New Jersey Automobile Co.—855 Springfield Ave., Newark, N. J. Garage. (Moline.)

GARAGES (Continued)

New Jersey Vulcanizing Co.—83 Halsey St., Newark, N. J. Garage.
New London Auto Station.—New London, Conn. Garage; repairing. (Thomas Flyer, Thomas Detroit, Haynes.)
Newman Bros.—134 Main St., Hackensack, N. J. Garage.
Newport Engineering Works.—359-365 Thames St., Newport, R. I. Garage; repairing; supplies.
Newport Mfg. Co.—18 S. Baptist St., Newport, R. I. Garage.
Newton Center Automobile Repair Station & Garage.—Beacon St., Newton, Center, Mass. Garage; repairing.
Newton Garage.—24 Brook St., Newton, Mass. Garage.
New York Auto College.—45 W. 44th St., New York City. Garage.
New York Auto Garage.—306-308 W. 65th St., New York City. Garage.
New York Auto Repository.—Ocean House Stables, Newport, R. I. Garage.
New York City Garage.—10 W. 60th St., New York City. Garage.
New York Transfer Co.—344 West 50th St., New York City. Garage.
New York Transfer Co.—524 W. 36th St., New York City. Garage.
New York Transportation Co.—49th St. & 8th Ave., New York City. Garages at 19 Downing St., Newport, R. I.; 66th St. & 3rd Ave., New York City; 27th St. & 9th Ave., New York City; Bowery & Bayard St., New York City. Garage; rental service. (Exide batteries, Columbia.)
Niagara Falls Automobile Transit Co.—103 Main St., Niagara Falls, N. Y. Garage; repairing; supplies. (Cadillac, Winton.)
Nichols, W. L.—244 W. 49th St., New York City. Garage.
Norcross-Cameron Co.—57-61 Bridge St., Springfield, Mass. Garage; supplies. (Rambler, Ford, Corbin.)
Nordgren & Holdlerman.—Paxton, Ill. Garage.
Norfolk Horse, Carriage & Auto Co., Inc.—Norfolk, Va. Garage.
Norris City Garage.—Main & Chain St., Norristown, Pa. Garage.
Northampton Garage Co.—Northampton, Mass. Garage.
North Division Auto Co.—385 E. Superior St., Chicago, Ill. Garage.
North End Garage Co.—5 New Bedford, Mass. Garage.
North End Motor Car Co.—St., East Orange, N. J. Garage.
Northern Garage.—77 V. falo, N. Y. Garage.
Northern Garage.—3315 adelphia, Pa. Garage.
North Jersey Motor Cington Pl., East Orange, N. J. Garage.

GARAGES (Continued)

North Side Auto Station.—446 N. Clark St., Chicago, Ill. Garage.
Northwestern Motor Car Co.—1928-30 N. 20th St., Philadelphia, Pa. Garage; repairing. (Moline.)
Northwest Motor Co.—29th Ave., Spokane, Wash. Garage.
Northwestern Motor Vehicle Co.—112 S. 6th St., Minneapolis, Minn. Garage.
Norton, C. E.—Water St., Guilford, Conn. Garage.
Norton, R. D.—Hightstown, N. J. Garage. (Maxwell.)
Norwich Motor & Machine Co.—30 Lackawanna Ave., Norwich, N. Y. Garage.
Norwood Automobile Co.—Norwood, O. Garage.
Norwood Garage.—121 Norwood Ave., Buffalo, N. Y. Garage.
Nyberg Automobile Works.—30th St. and Michigan Ave., Chicago, Ill. Garage; repairing.

O

Oakland Auto Garage.—12th St. & 8th Ave., Oakland, Cal. Garage.
O'Beirne & Co., F.—1737 Grand St., Kansas City, Mo. Garage.
O'Connor, W. F.—Clapp and Church Sts., Woodstock, Ill. Garage.
Odell Electric Co.—Odell, Ill. Garage.
Odell, R. L.—156 W. 39th St., New York City. Garage.
O'Farrell, C. T., Jr.—Dilon, S. C. Garage.
Ofeldt & Sons, F. W.—Nyack, N. Y. Garage.
Official A. A. A. Blue Book Station.—Concord, N. H. Garage; repairing; supplies.
Ogden Automobile Co.—24th St., Ogden, Utah. Garage.
Ogden, D.—332 5th St., Columbus, Ind. Garage; repairing. (Reo, Wayne, Jackson, Haynes.)
O. K. Machine Works.—887 Main St., Buffalo, N. Y. Garage; repairing; supplies.
Olean Garage Co.—481 Union St., Olean, N. Y. Garage.
Oliver Electric Vehicle Co.—1737 12th St., Cleveland, Ohio. Garage.
Oliver, J. H.—2210 Farnum St., Chicago, Ill. Garage.
Oliver, J. H.—103 W. 2nd St., Chicago, Ill. Garage.
Oliver, J. H.—Center St., Chicago, Ill. Garage.
Oliver, J. H.—Redlands, Cal. Garage; repairing. (Royal.)
Oliver, J. H.—Ottawa, Ill. Garage.
Oliver, J. H.—Flatbush & 4th Ave., Brooklyn, N. Y. Garage.

GARAGES (Continued)

Outlook Motor Co.—102 W. 107th St., New York City. Garage.
Owens & Co., A. N.—1307 Morton St., Baltimore, Md. Garage.
Oxford Automobile Co.—N. Canal St., Oxford, N. Y. Garage.
Oxnard Garage & Machine Shop.—5th St., Oxnard, Cal. Garage.

P

Pacific Coast Automobile Co.—Seattle, Wash. Garage; repairing. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Thomas Flyer, Thomas-Detroit, Oldsmobile, Buick.)
Packard Auto Renting Co.—1499 Broadway, New York City. Garage.
Packard Garage.—162½ W. 46th St., New York City. Garage.
Packard Motor Car Co.—1861 Broadway, New York City. Garage. (Packard.)
Packing House Equipment Co.—Euclid Ave., Upland, Cal. Garage.
Page, Sewell, Jr.—Waverly, Iowa. Garage.
Paige Electric Co.—238 Main St., Worcester, Mass. Garage.
Palace Auto Co.—1408-10 Walnut St., Kansas City, Mo. Garage; repairing. (Pierce, Oldsmobile, Columbia.)
Palace Automobile Station.—32 Hermon St., Worcester, Mass. Garage; repairing. (Rambler.)
Palace Auto Station Co., Inc.—348 Trumbull St., Hartford, Conn. Garage. (Thomas Flyer, Autocar, Oldsmobile.)
Palace Garage Co.—214 W. 80th St., New York City. Garage.
Pales, D. W.—Box 117, Guayama, Porto Rico. Garage.
Palmer & Singer Mfg. Co.—1620-1624 Broadway, New York City. Garage; repairing.
Palmer, Frank.—40-50 Jefferson Ave., N. Battle Creek, Mich. Garage; repairing; supplies. (Reo.)
Palmer, W. J.—220 W. 10th St., Wilmington, Del. Garage.
Palomo, Domingo.—Calle 64, No. 411, Merida, Yucatan, Mexico. Garage.
Park Auto Co.—893 E. 51st St., Chicago, Ill. Garage.
Park Brew Co.—1100 Elmwood Ave., Providence, R. I. Garage.
Park Circle Garage.—4-6 Ocean Parkway, Brooklyn, N. Y. Garage.
Parker & Co., D. L., Auto Station.—18 Market St., New Bedford, Mass. Garage; repairs; supplies. (Pope-Toledo, Pope-Hartford.)
Parker & Co., W. H.—148 Broadway, Long Branch, N. J. Garage.
Parker, E. J.—428 Broad St., Providence, R. I. Garage.

GARAGES (Continued)

Parkers Trinity Square Garage.—428 Broad St., Providence, R. I. Garage.

Park Garage Co.—2212-2214 Spring Garden St., Philadelphia, Pa. Garage.

Park Garage Co., The.—Pittsburg, Pa. Garage.

Park Square Auto Station.—43 Columbus Ave., Boston, Mass. Garage; repairing. (Stoddard-Dayton, Buick.)

Parkin & Son.—2417 N. Broad St., Philadelphia, Pa. Garage.

Parkway Garage Co., The.—Bayshore, L. I. Garage.

Parkway Garage Co.—Central Park West & 110th St., New York City. Garage; repairing.

Parsons, Henry B.—Pine St., Stockbridge, Mass. Garage; repairing.

Pasadena Automobile Co.—57 W. Union St., Pasadena, Cal. Garage.

Patterson, Wm. T.—Bellefontaine, Ohio. Garage.

Pattinson Mfg. Co.—Rear 48 Stanhope St., Boston, Mass. Garage; repairing.

Paul & Heming.—Jerome Ave. & 162nd St., New York City. Garage.

Pearson, C. W.—625 Landis Ave., Vine-land, N. J. Garage.

Pearson, W.—Whitman, Mass. Garage.

Pease & Sons, S. C.—Merrimac, Mass. Garage.

Peck, J. D.—Peckville, Pa. Garage.

Peerless Garage.—942-944 Bedford Ave., Brooklyn, N. Y. Garage; repairing. (Peerless.)

Peerless Motor Car Co. of New England. 178 Columbus Ave., Boston, Mass. Garage; repairing. (Peerless.)

Peerless Motor Car Co.—220 W. 41st St., New York City. Garage; repairing. (Peerless.)

Penny, C. B.—Buffalo, N. Y. Garage.

Pentuckert Garage Co.—Central St., Haverhill, Mass. Garage.

Pequot Garage.—Pequot Ave., New London, Conn. Garage; repairing.

Perkins Auto Garage.—Main St., Rockaway, N. J. Garage; repairing. (Corbin.)

Perkins, B. B.—St. Albans, Vt. Garage; repairing. (Cadillac, Franklin.)

Peshak & Co., E. H.—Sun Prairie, Wis. Garage.

Peters & Mulavey.—Detroit, Mich. Garage.

Peterson, O. P.—Fort Dodge, Ia. Garage.

Peterson, P. C.—308 Main St., Davenport, Iowa. Garage.

Peulick, Fred.—9120-9122 Erie Ave., S. Chicago, Ill. Garage.

Pfieger, J.—1602 Bushwick Ave., Brooklyn, N. Y. Garage.

Phelps, H. J.—Sidney, N. Y. Garage.

GARAGES (Continued)

Phoenix Automobile Exchange.—4495 San Pablo Ave., Oakland, Cal. Garage.

Phoenix Garage.—526-528 Main St., Chicago, Cal. Garage.

Pierce, S. K.—Gardner, Mass. Garage.

Pierson, Jesse D.—Washington and Olive Sts., Chester, Pa. Garage.

Pine, Dr. Milton B.—127 S. Lafayette St., South Bend, Ind. Garage.

Pioneer Auto Livery.—1446 Indiana Ave., Chicago, Ill. Garage.

Pioneer Automobile Co.—520-534 20th St., Oakland, Cal. Garage; repairing. (Winton, Thomas, Oldsmobile.)

Pitman & Nelson Auto Co.—2036 Addison St., Berkeley, Cal. Garage; repairing. (Page-Adrian.)

Pittsfield Auto Garage Co.—328 North St., Pittsfield, Mass. Garage; repairing; supplies. (Rapid Maxwell, Berkshire.)

Pitta, W. W.—S. Main St., Roswell, New Mexico. Garage.

Plaza Garage.—152 E. 55th St., New York City. Garage.

Plimley Automobile Co., Ltd.—Victoria, B. C., Canada. Garage.

Pollard Auto Station.—230 Main St., Nashua, N. H. Garage. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, Cadillac.)

Poole, W. J.—370 12th St., Oakland, Cal. Garage.

Pope Automobile Co. of Washington.—817-819 14th St., N. W., Washington, D. C. Garage; repairing. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Locomobile, Autocar.)

Pope Automobile Co.—Washington, Pa. Garage.

Pope Motor Car Co.—Casino Terrace, Newport, R. I. Garage; repairs; supplies.

Porrier, A.—Franklin St., Garden City, N. Y. Garage; repairing. (Maxwell.)

Potter, Sidney E.—Bet. Elm & Walnut Sts., Pierce City, Mo. Garage; repairing. (Ford.)

Pratt, C. B.—105 Grant St., E. Weymouth, Mass. Garage.

Prescott, B. M., Jr.—Main St., Franklin Falls, N. H. Garage.

Press, John E.—131-133 N. Boulevard, Oak Park, Ill. Garage.

Pritchard, R. S.—39-41 Gallia Portsmouth, Ohio. Garage; repairing. (Winton, Buick, Pope-Waverley)

Privett & Arbuckle.—Greenburg. Garage.

Prospect Garage.—3-5 Prospect West, Brooklyn, N. Y. Garage.

Prouty, Geo. H.—Barre, Vt. Garage.

Providence Auto Garage.—Broad & Potter Ave., Providence, R. I. Garage.

GARAGES (Continued)

Providence Motor Car Co.—48 Custom House St., Providence, R. I. Garage.
Puget Sound Auto Co.—1405-07 Broadway, Seattle, Wash. Garage; repairing. (National, Rambler, Babcock Electric, Commerce Trucks.)
Pupki Garage.—488 Hancock St., Brooklyn, N. Y. Garage.
Purington, A. B.—126 Exchange St., Bangor, Me. Garage; repairs; supplies. (Cadillac, Columbia.)
Puts.—76 Washington St., Salem, Mass. Garage.
Pyott, A. M.—Belmar, N. J. Garage.
Pyramid Garage Co.—36-38 West 62d St., New York City. Garage.

Q

Quaker City Auto Co.—144 N. Broad St., Philadelphia, Pa. Garage; repairing. (Pope-Toledo, Pope-Hartford.)
Quinn, James A.—300½ W. 54th St., New York City. Garage.
Quinsler Co.—26 Cambria St., Boston, Mass. Garage.
Quogue Automobile & Bicycle Co.—Jessop Ave., Quogue, N. Y. Garage; repairing; supplies.

R

Rabeneau, Edwin.—Iowa City, Iowa. Garage.
Rabenold, W. F.—28 N. 11th St., Allentown, Pa. Garage; repairing. (American Berliet, Dolson, Dragon.)
Rahway Appliance Mfg. Co.—12 Plain St., Albany, N. Y. Garage.
Rainis Automobile Co.—W. Adams St., Jacksonville, Fla. Garage.
Rambler Garage.—1218 Sheridan Road, Chicago, Ill. Garage.
Randall, A. G.—109 N. 11th St., Boise, Ida. Garage; repairing. (Buick, Waltham.)
Randall, A. W.—Jones St., Port Jefferson, N. Y. Garage.
Rand Auto Co., The F. L.—112 Ashland St., North Adams, Mass. Garage.
Ranney & Co., A. Elliott.—237 Halsey St., Newark, N. J. Garage.
Ranney & Co., A. Elliott.—1851 Broadway, New York City. Garage; repairing. (Elmore.)
Ray & Motor Co.—Perth Amboy, N. J. Garage.
Rea, H. F.—609 French St., Erie, Pa. Garage.
Reuben House Garage.—Exchange St., N. Y. Garage.
Recreation, Fred.—Newtonville, Mass. Garage.
Reichert Automobile Co.—26 S. Fifth St., Pa. Garage; repairing.
Reichert, Franklin. Buick, Oldsmobile, Pope-Waverley.)

GARAGES (Continued)

Read, W. K.—Texarkana, Ark. Garage. (Holsman.)
Reagan, John T.—S. Baptist St., Newport, R. I. Garage.
Redlands Auto Co.—9-11 W. Citins Ave., Redlands, Cal. Garage.
Reed & Co., S. L.—25 Westfield Ave., Elizabeth, N. J. Garage.
Reed Bros.—715 19th St., N. W., Washington, D. C. Garage.
Reeves Auto Station.—7th & Market Sts., Camden, N. J. Garage.
Regent Garage.—4618 Regent St., Philadelphia, Pa. Garage.
Reichert Automobile Co., The.—34-44 Temple St., New Haven, Conn. Garage; repairing; supplies. (Haynes, Waltham.)
Reid, W. J.—52 La Salle St., Aurora, Ill. Garage.
Reiff, Frank H.—16 N. Beaver St., York, Pa. Garage.
Reighard, D. P.—Ellsworth & College Ave., Pittsburg, Pa. Garage.
Reliable Auto Station.—49 E. Utica St., Buffalo, N. Y. Garage.
Reliable Repair Co.—1607 Michigan Ave., Chicago, Ill. Garage.
Reliable Automobile Co.—7th and Pacific Ave., Tacoma, Wash. Garage. (Baker, Buick, Oldsmobile, Pope-Hartford, Pope-Toledo, Thomas.)
Reliable Automobile Co.—1000 Bolivar Rd., Cleveland, O. Garage.
Reliance Automobile Co.—347-57 Fulton St., San Francisco, Cal. Garage; repairing; supplies.
Renstrom Co., Frank O.—424 Stanyan St., San Francisco, Cal. Garage; repairing. (Pullman, Pennsylvania.)
Reo Automobile Co.—283 Halsey St., Newark, N. J. Garage.
Reynold & Archer.—169th St. and Jerome Ave., New York City. Garage.
Reynold's Motor Works.—3149 Wabash Ave., Chicago, Ill. Garage.
Rhode Island Second-Hand Auto Reg.—7 Dorrance St., Providence, R. I. Garage.
Rhodes, H. C.—E. Main St., Bay Shore, N. Y. Garage; supplies.
Rialto Automobile Exchange.—307 W. 44th St., New York City. Garage.
Rice, C. B.—Merton Road, Newport, R. I. Garage.
Rice, C. B.—941 8th Ave., Cleveland, O. Garage.
Rice, Chas.—Waverley, Kan. Garage.
Rice, Louis E.—Gedar Rapids, Ia. Garage.
Richards & Simons.—Maine & Elm Sts., Southbridge, Mass. Garage.
Richards, J. L.—Oakwood Road, Newton, Mass. Garage.
Richmond Auto & Storage Co.—27 Chenango St., Buffalo, N. Y. Garage.

GARAGES (Continued)

- Ridgway Auto Co.**—Ridgway, Pa. Garage.
Riding & Driving Club.—Prospect Park Plaza, Brooklyn, N. Y. Garage.
Risley, W. H.—Venice, Cal. Garage.
Rittenhouse Garage.—220 S. 23rd St., Philadelphia, Pa. Garage; repairing. (American Mercedes.)
Riverside Auto Transfer Co.—Riverside, Cal. Garage.
Robertson, E. B.—204 Washington St., South Norwalk, Conn. Garage.
Robinson's Auto Station.—Pleasant St., opp. Chestnut, Worcester, Mass. Garage. (Elmore, Cadillac.)
Robinson, W. A.—56 Prospect St., Woonsocket, R. I. Garage.
Roby Co., Sidney, B.—208 South Ave., Rochester, N. Y. Garage.
Rochelle Motor Co.—Main St., New Rochelle, N. Y. Garage.
Rock Creek Auto & Wagon Works.—2613 Pennsylvania Ave., N. W., Washington, D. C. Garage.
Rockingham Auto Garage.—13 Vaughan St., Portsmouth, N. H. Garage.
Rockland Garage & Auto Co.—12-20 Winter St., Rockland, Me. Garage.
Rockland Machine & Foundry Co.—42 Morris St., Jersey City, N. J.
Rodefild Mfg. Co.—96 W. Main St., Richmond, Ind. Garage.
Roe & Sons, Justus.—52 E. Main St., Patchogue, N. Y. Garage.
Roman Automobile Co.—1907 Market St., Philadelphia, Pa. Garage.
Ross Motor Car Co., C. A.—40 W. Main St., Little Falls, N. Y. Garage; repairs; supplies.
Ross, R. L.—12th St. & 3rd Ave., Columbus, Ga. Garage.
Rost, J. P.—Kokomo, Ind. Garage.
Roth, Robert.—1423 North Ave., Bridgeport, Conn. Garage.
Rounds, George E.—Park Ave., opp. R. R. Station, Plymouth, Mass. Garage; repairing.
Roussey Tire Co., A. J.—621 Harrison St., Fort Wayne, Ind. Garage.
Rowley, H.—Billings, Mont. Garage.
Royal Tourist Car Co.—1108 E. 15th St., Kansas City, Mo. Garage.
Rubidoux-Riverside Auto Co.—Riverside, Cal. Garage.
Ruggles, F. A.—Ware, Mass. Garage.
Rush, C. W.—2036 Euclid Ave., Cleveland, O. Garage.
Russell & Hoague.—425 E. Main St., Kalamazoo, Mich. Garage; repairs; supplies.
Russell, W. C.—666 State St., New Haven, Conn. Garage.
Rutan & Co., P. C.—46 Front St., Port Jervis, N. Y. Garage; repairing. (Pope-Hartford.)

GARAGES (Continued)

- Rutland Machine & Automobile Co.**—55-61 Wales St., Rutland, Vt. Garage; repairing. (Buick, Winton, Franklin.)
Rutledge Garage.—100 Rutledge St., Brooklyn, N. Y. Garage.
Ryan, J. L.—Vicksburg, Miss. Garage.
Ryan, P. F.—910 Central Arcade, Schenectady, N. Y. Garage.
- S**
- Sabin, C. H.**—3 Congress St., St. Albans, Vt., Garage.
Sackett, H. I.—256 Pearl St., Buffalo, N. Y. Garage.
Sague & Son, Horace.—184-192 Church St., Poughkeepsie, N. Y. Garage; repairs; supplies. (Cadillac.)
Salisbury & Son.—14 Tilden Ave., Jamestown, N. Y. Garage.
Salthouse, J. T.—McPherson, Kan. Garage.
Sanderson, Dr.—Woodward Ave. & Wetherell St., Detroit, Mich. Garage.
Sandford, Edw. B.—Warwick, N. Y. Garage.
Sands Garage, H. B.—623 Bergen St., Brooklyn, N. Y. Garage.
Sandwick, F. W.—913 W. Howard St., Baltimore, Md. Garage.
Sanger, Geo. T.—206 W. Main St., Orange, Mass. Garage; repairing. (Oriente, Reo, Yale, Motorcycles.)
Santa Maria Garage.—Santa Maria, Cal. Garage.
Sartori, Richard V.—353 W. 39th St., New York City. Garage.
Saulpaugh, C. H.—Mankato, Minn. Garage.
Savannah Auto Brokers.—12 Bull St., Savannah, Ga. Garage.
Savell, J. E.—204 35th St., Chicago, Ill. Garage.
Sawyer, J. W.—Fairfield, Me. Garage.
Schaaf Garage.—Fulton & Cumberland St., Brooklyn, N. Y. Garage.
Schade, Henry.—323 Central Ave., Albany, N. Y. Garage.
Schafer, R.—Albany, N. Y. Garage.
Schlig & Moore Auto Works.—Evansville, Ill. Garage.
Schmidt Automobile Co.—327 S. Gilbert St., Iowa City, Iowa. Garage; repairing.
Schneer, Jos. J.—1009 N. J. mento, Cal. Garage.
Schreiber, W.—132 W. 49th York City. Garage.
Schrick, E.—22 Spring St., Rochester, N. Y. Garage.
Schroeder, G. H.—Stroudsburg, Pa. Garage.
Schroeder, H.—229-231 W. York, Pa.; Main St., Shrewsbury, Mass. Garage; repairing. (Reo, Prentiss Pullman.)

GARAGES (Continued)

- Schulte, G. W.**—Wyoming & W. Market Sts., Wilkesbarre, Pa. Garage.
Scott, Chas. B.—119 Franklin Ave., Scranton, Pa. Garage.
Scott, Motor Co., Geo. J.—1720-22 Broadway, New York City. Garage; repairing. (Glide.)
Scrivens' New Garage, C. L.—13 Spring St., Ashtabula, Ohio. Garage; repairing. (Buick, Cadillac.)
Scadate, Geo. H.—1923 Washington Ave., New York City. Garage.
Sea Gate Garage.—Sea Gate, N. Y. Garage.
Sears Bros Co.—750-752 Mass. Ave., Indianapolis, Ind. Garage.
Seavy, Wm. G.—616 Blue Hill Ave., Boston, Mass. Garage.
Selma Gun & Key Co.—917 Water St., Selma, Ala. Garage; repairing. (Pope-Hartford, Wayne, Waltham, Mitchell.)
Service, W. E.—Bridgeton, N. J. Garage.
Seyler, Wm.—Goodland, Kan. Garage.
Seymour-Benn Co.—104 Jefferson Ave., Brooklyn, N. Y. Garage.
Seymour, Walter F.—536 Atwells Ave., Providence, R. I. Garage.
Shafer, Henry.—436 Lion St., Dunkirk, N. Y. Garage.
Shaffer, R. G.—203 Bridge St., Phoenixville, Pa. Garage.
Shailer, F. S.—Chester, Conn. Garage.
Shamokin Novelty Co.—Shamokin, Pa. Garage.
Sharp, I. H.—Main St., Bernardsville, N. J. Garage.
Shaw-Brown Motor Co.—89 Main St., Buffalo, N. Y. Garage.
Shaw Co., Walden W.—1532-34 Michigan Ave., Chicago, Ill. Garage; repairing. (Berliet.)
Shawmut Motor Co.—1091 Boylston St., Stoneham, Mass. Garage.
Sheehans' Garage.—12 Stockbridge St., Springfield, Mass. Garage.
Shenandoah Auto Garage.—1610 Briar Place, Chicago, Ill. Garage.
Sherburne & Co., A. H.—70 Middle St., Lowell, Mass. Garage.
Sheridan Auto Station.—3210 N. Clark St., Chicago, Ill. Garage.
Shoemaker Auto Co.—Elkhart, Ind. Garage.
Shore, Frank.—1211 New York Ave., Washington, D. C. Garage.
Short & Bros., John J.—2028 Sansom St., Philadelphia, Pa. Garage.
Shroyer & Co., G. W.—Dayton, Ohio. Garage.
Shugert, G. S.—247 Adams St., Rochester, Pa. Garage; repairing. (Northern, Rambler, Haynes.)

GARAGES (Continued)

- Sid Black Automobile Co.**—630 Walnut St., Cincinnati, O. Garage; repairing; supplies; renting. (Babcock, Lozier, Franklin, Thomas, Buick.)
Sidow, Chas.—Aberdeen, S. Dak. Garage.
Siems, Peter.—Summit Ave. & Grotto St., St. Paul, Minn. Garage.
Sigler & Pettinger.—Sutherland Bldg., Santa Maria, Cal. Garage.
Silver Lake House Garage.—Madison, N. H. Garage.
Simmons, Burt R.—310 Connolly St., Paris, Ill. Garage; repairing. (Waltham, Buick, Pope-Toledo.)
Simpson, J. J.—Carbondale, Pa. Garage.
Sinson Garage Co., The.—Sinson, Cal. Garage.
Sioux Falls Auto Supply Co.—112-114 N. Main Ave., Sioux Falls, S. Dak. Garage; repairing. (Jackson; Rambler, Ford.)
Skene, J. W.—88-90 Bates St., Lewiston, Me. Garage; repairing. (Rambler, Ford.)
Smillie & Co., Harry.—Mill & Market Ave., Rhinebeck, N. Y. Garage.
Smith & Grovannetti.—814 14th St., N. W., Washington, D. C. Garage.
Smith & Zimmerman.—Raleigh & James St., Harrisburg, Pa. Garage.
Smith Bros.—Essex St., Melrose, Mass. Garage.
Smith, Charles.—Main St., Homer, Ill. Garage.
Smith Garage & Repair Co., George.—257 N. Union St., Olean, N. Y. Garage; repairs; supplies.
Smith, L. H.—Gardner, Mass. Garage.
Smith, P.—West Plains, Mo. Garage.
Smith's Auto Garage.—83 Main St., Westerley, R. I. Garage.
Smythe, F. W.—7th & H Sts., Eureka, Cal. Garage.
Snow, E. L.—Brook St., Newton, Mass. Garage.
Snyder & Co.—20 Railroad Place, East Orange, N. J. Garage.
Snyder & Co.—Orange, N. J. Garage.
Snyder, Clark.—Mill St., Rhinebeck, N. Y. Garage.
South Broad Automobile Co.—729 S. Broad St., Philadelphia, Pa. Garage; repairs; supplies; renting; electric charging. (Dorris, Stevens-Duryea.)
Southern Auto Equipment Co.—Atlanta, Ga. Garage.
Southern Garage Co.—35-37 W. Mound St., Columbus, Ohio. Garage; repairing. (Buick.)
South Park Auto Station.—312-316 E. 57th St., Chicago, Ill. Garage.
South Side Auto Repositories.—769 44th St., Chicago, Ill. Garage.
South Side Auto Station.—323 E. 35th St., Chicago, Ill. Garage.

GARAGES (Continued)

South Tacoma Garage Co.—South Tacoma, Wash. Garage.
Spalding & Bros., A. G.—Offices, 29 W. 42d St.; garage, 144 W. 50th St. Garage; repairs. (Stevens-Duryea.)
Spartansburg Automobile Co.—Spartansburg, S. C. Garage.
Speakman & Bousall.—105 Main St., Coatesville, Pa. Garage.
Speedway Garage.—414 W. 155th St., New York City. Garage; repairing.
Spencer Bros.—Charleroi, Pa. Garage.
Spencer, Edwin C.—4 Mantic Ave., Providence, R. I. Garage.
Spencer, H. L.—5 N. Main St., Pawtucket, R. I. Garage.
Sperry, Wilbur.—Myrtle St., Leroy, N. Y. Garage.
Springfield Auto Mfg. Co.—Springfield, Ill. Garage.
Springfield Automobile Co.—40 Liberty St., Springfield, Mass. Garage. (Locomobile, Franklin, Stevens-Duryea.)
Squires, H. G.—Southampton, L. I. Garage.
Stamped Steel Engine Mfg. Co.—475 E. 105th St., Cleveland, O. Garage.
Standard Auto & Cycle Works.—41 Woodlawn Ave., Buffalo, N. Y. Garage.
Standard Auto Co.—640 Main St., Cincinnati, Ohio. Garage.
Standard Auto Garage Co.—257-259 E. Markét St., Akron, O. Garage.
Standard Automobile Works.—110 5th Ave., Clinton, Iowa. Garage, repairing. (Moline.)
Standard Garage Co.—1114 Main St., Buffalo, N. Y. Garage.
Star Auto Garage.—2253 Cottage Grove Ave., Chicago, Ill. Garage.
Star Electrical & Garage Co.—609-613 French St., Erie, Pa. Garage; repairing; supplies.
Stark Summit Auto Co.—512 S. Arch Ave., Alliance, Ohio. Garage; repairing. (Mitchell, Cartercar, Ford, Marvel.)
Starr, W. H.—88 Green St., New London, Conn. Garage.
State Street Garage.—468 State St., Rochester, N. Y. Garage.
Steevens, N. A.—Temple St., nr. N Ave., Owego, N. Y. Garage.
Steffer Launch & Automobile Co.—Winona, Minn. Garage.
Stein, Charles.—Akron, Ohio. Garage.
Steinhart-Jensen Auto Co.—631 Jefferson St., Joliet, Ill. Garage.
Stepanek, W. H.—116 10th St., Cedar Rapids, Iowa. Garage.
Sterling Motor Car Co.—180-184 Water St., Binghamton, N. Y. Garage; repairing. (Ford, Marmon, St. Louis, Jackson.)

GARAGES (Continued)

Steuben Automobile Co.—92 E. Market St., Corning, N. Y. Garage.
Stevens Co., E. A.—Rear Fitchburg Hotel, Main St., Fitchburg, Mass. Garage; repairing. (Glide.)
Steward & Kennedy.—5208-12 Lake Ave., Chicago, Ill. Garage.
Stewart, C. T.—Council Bluffs, Ia. Garage.
Stewart, D. W.—Traverse, Mich. Garage.
St. Jock, Joseph.—St. Johnsbury, Vt. Garage.
St. John & Sons, S. H.—1420 Court Pl., Denver, Colo. Garage.
St. Louis Auto Station.—465 Colorado Ave., Chicago, Ill. Garage.
St. Nicholas Auto Depot.—53 W. 66th St., New York City. Garage.
Stoddard, A.—18 Main St., Jacksonville, Fla. Garage.
Stoddard-Dayton Garage.—3959 Grand Blvd., Chicago, Ill. Garage.
Stoltz, C. C.—126-128 N. Prospect St., Marion, Ohio. Garage; repairing; supplies. (Autocar, Buick.)
Stone Automobile Co., Inc.—1006 Main St., Stroudsburg, Pa. Garage; repairing. (Cadillac, Stevens-Duryea.)
Stowe, Geo.—203 Commercial St., Worcester, Mass. Garage.
Strang, C. G.—10 N. Nevada St., Colorado Springs, Colo. Garage; repairing.
Strathmann, Charles.—165 E. 120th St., New York City. Garage.
Stuart, J. H.—McIndoe Falls, Vt., Garage; repairing. (Reo, Premier.)
Stubbe, F. H.—528 Morris Ave., New York City. Garage.
Studebaker Garage.—138 W. 48th St., New York City. Garage.
Stutsman & Co., C. B.—Monte Vista, Colo. Garage; repairing. (Ford, Gale, Reliance, Dayton.)
Stutzman, Clyde.—1061 Vine St., Williamsport, Pa. Garage.
Stuyvesant Heights Auto Co.—449 Madison St., Brooklyn, N. Y. Garage.
Suddard Motor Cycle Co.—58 Warren St., Providence, R. I. Garage.
Sulson Garage Co., The.—Sacramento, Cal. Garage.
Summer, S. J.—Main St., Valparaiso, Ind. Garage.
Summey, C. E.—52 Gil N. Y. Garage.
Sutton, John W.—342-344 10-12 Clinton St., and 8-13 Union Brooklyn, N. Y. Garage; supplies.
Swampscott Auto Co. Mass. Garage.
Swenson, R. A., Mrs.—185 Providence, R. I. Garage; repairing. (Indian, Merkel.)

GARAGES (Continued)

T

- Tampa Harness & Wagon Co.**—Tampa, Fla. Garage; repairing. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Tanberg Auto Co.**—River & Gibson St., Eau Claire, Wis. Garage; repairing. (White, Buick, Oldsmobile, Pope-Waverley.)
- Tanner & Co.**—New Bedford, Mass. Garage.
- Tanner, W. A.**—St. Johns, Kan. Garage.
- Tarkio Automobile Co.**—Tarkio, Mo. Garage.
- Taylor & Ascher.**—408 Main St., Asbury Park, N. J. Garage.
- Taylor Automobile Co., Inc.**—33-35 Orange St., Albany, N. Y. Garage; repairing. (Locomobile.)
- Temple, T. W.**—118 S. Main St., McPherson, Kan. Garage.
- Taylor, Charles S.**—Great Barrington, Mass. Garage.
- Taylor, Ted.**—S. Park St., Streator, Ill. Garage.
- Tegan Bros. & Snyder.**—236 Jefferson Ave., Detroit, Mich. Garage.
- Texas Automobile Co.**—San Antonio, Tex. Garage.
- Thirty-first Street Garage.**—316 31st St., Chicago, Ill. Garage.
- Thomas, J. R.**—1208 Connecticut Ave., Washington, D. C. Garage. (Maxwell.)
- Thompson Auto Co.**—1924 Westminster St., Providence, R. I. Garage.
- Thompson Automobile Co., Andrew C.**—413 Park Ave., Plainfield, N. J. Garage.
- Thompson's Chelsea Garage.**—California Ave., Atlantic City, N. J. Garage.
- Thorpe, R. E.**—Los Angeles, Cal. Garage.
- Thcurot, Paul.**—240 W. 27th St., New York City. Garage.
- Tierney, S. P. & Stantial Co.**—Stoneham, Mass. Garage.
- Tiffany, Calvin H.**—Willimantic, Conn. Garage.
- Times Square Automobile Co.**—1599-1601 Broadway, New York City. Garage; repairing. (Second-hand cars.)
- Timmins & Butler.**—286 Ellicott St., Buffalo, N. Y. Garage.
- iner, C. E.**—Binghamton, N. Y. Garage.
- L. H.**—Glen St., Glen Cove, N. Y. Garage; repairing.
- James B.**—322 Peachtree St., Atlanta, Ga. Garage; repairing. (Stoddard-Dayton.)
- an Carriage Works.**—12th & French, Erie, Pa. Garage.
- r, J. A.**—Riverbank Court, Cambridge, Mass. Garage.

GARAGES (Continued)

- Towle, A. N.**—540 Wabash Ave., Chicago, Ill. Garage.
- Towle Co., The E. H.**—Opp. Hotel Elton, 25 W. Main St., Waterbury, Conn. Garage; repairs; supplies. (Locomobile, Franklin, Cadillac.)
- Townsaley, Dr. R. H.**—Wagner, S. Dak. Garage.
- Transfer Auto Station.**—234 Dudley St., Boston, Mass. Garage.
- Travis & Oczho.**—215 N. Perry St., Johnstown, N. Y. Garage.
- Tremont Garage.**—541 Tremont St., Boston, Mass. Garage.
- Tremont Garage & Repair Station.**—1923 Washington Ave., New York City. Garage.
- Trenton Auto & Supply Co.**—130 N. Warren St., Trenton, N. J. Garage.
- Tripp, B. D.**—Marion, Mass. Garage.
- Trowbridge, A.**—17 South St., Morristown, N. J. Garage; repairing. (Reo, Premier.)
- Tucker, W. M.**—399 Spadena Ave., Toronto, Canada. Garage.
- Tulsa Automobile Co.**—Tulsa, Ind. Ter. Garage.
- Turnbull, G. A.**—Princeton, Ill. Garage; repairing. (Moline.)
- Turnbull, Wm.**—221 S. Madison St., Peoria, Ill. Garage.
- Turner, G. W.**—45 Stanhope St., Boston, Mass. Garage.
- Tuxedo Garage Co.**—33 E. 58th St., New York City. Garage.
- Twentieth Century Motor Car Co.**—121-125 S. Lafayette St., South Bend, Ind. Garage; repairing. (Buick.)
- Twombly Power Co. & Garage.**—51st St. & 12th Ave., New York City. Garage.
- Tygard, James W.**—920 South Ave., Plainfield, N. J. Garage.
- Tyler, F. W.**—Chester, Conn. Garage.

U

- Union Automobile Co.**—Homewood, Pa. Garage.
- Union Automobile Co.**—33 Grant Square, Brooklyn, N. Y. Garage.
- Union Garage.**—784-786 Union St., Brooklyn, N. Y.
- Union Light & Power Co.**—St. Louis, Mo. Garage; repairing. (Rauch & Lang, Studebaker, Columbia.)
- United States Automobile Co.**—21-29 Plymouth Ave., near Main St., W. Rochester, N. Y. Garage; repairing; supplies. (Locomobile, Autocar, Stevens-Duryea, Pierce Arrow.)
- University Garage Co.**—St. John & Olive Sts., New Haven, Conn. Garage; supplies. (Wayne.)
- University Place Garage.**—Washington Sq., New York City. Garage.
- Unkrich, Fred.**—Schaefer Block, Galion, Ohio. Garage.

GARAGES (Continued)

- Uddike, C. Ora.**—145 E. Main St., Lexington, Ky. Garage; repairing; supplies. (Rambler.)
Upper Automobile Co.—35 Clifford St., Providence, R. I. Garage.
Utica Automobile Station.—22-24 W. Utica St., Buffalo, N. Y. Garage; repairing; supplies.
Utica Motor Car Co., The.—333-337 Bleecker St., Utica, N. Y. Garage; repairs; supplies. (Buick, Peerless, Pierce Arrow, Thomas Flyer, Baker, Cadillac, Darracq.)

V

- Vachon, Louis A.**—1209 Center St., Newton Centre, Mass. Garage.
Vallejo Auto Exchange.—Vallejo, Cal. Garage.
Van Benschoten, John.—14-20 Catharine St., Poughkeepsie, N. Y. Garage; repairs; supplies. (Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Lozier.)
Vandecar, W. D.—157 N. Ottawa St., Grand Rapids, Mich. Garage; repairing. (Reo, Glide.)
Vandergrit Mfg. Co.—Shelbyville, Ind. Garage.
Van Dorn, Fred H.—31 E. Front St., Red Band, N. J. Garage.
Van Horn, Grant.—Findlay, Ohio. Garage.
Van Kattengell, Edw.—Monmouth St. & Maple Ave., Red Bank, N. J. Garage.
Van Pelt Auto Co.—26 S. Van Pelt St., Philadelphia, Pa. Garage.
Van Warts Garage.—Palisade Ave., Englewood, N. J. Garage; repairing. (Reo, Maxwell, Studebaker, Crawford.)
Vehicle Storage Co.—6014 Rodman St., Pittsburg, Pa. Garage.
Velie, C. P.—Minneapolis, Minn. Garage.
Verea, Lic Jarres.—Guadalajara, Mexico. Garage.
Vick, V.—Houston, Tex. Garage.
Victor Auto Storage Co.—147 W. 55th St., New York City. Garage.
Virginia Automobile Co.—223 W. Broad St., Richmond, Va. Garage.
Volkman, C. F.—Nappanee, Ind. Garage.
Von Hamm Young Co.—Honolulu, Hawaiian Islands. Garage; repairing. Pope-Hartford, Pope-Waverley, Stevens-Duryea, White, Autocar, Maxwell.)
Vrooman Bros.—1259 State St., Schenectady, N. Y. Garage; repairing. (Elmore, Haynes, Waltham.)

W

- Wahrer, Roofus.**—Wapakoneta, Ohio. Garage.

GARAGES (Continued)

- Walker & Co., Samuel.**—Mexico City, Mexico. Garage.
Walker, E. C.—1913 Logan St., New Albany, Ind. Garage.
Walker Motor Car Co.—109 Fort St., Detroit, Mich. Garage.
Walker, Percy.—Wenatchee, Wash. Garage.
Wallace Bros. Co.—46-48 Main St., New Rochelle, N. Y. Garage, repairs; supplies. (Maxwell.)
Walton-Van Huffet Mfg. Co.—244 S. Chambers St., Galesburg, Ill. Garage.
Ward's Auto Garage.—23 Lafayette St., Saratoga, N. Y. Garage.
Warren Auto Exchange.—38 W. 62nd St., New York City. Garage.
Warrens Auto Garage.—Northampton, Mass. Garage.
Warren, W. F.—214 Washington St., Jamestown, N. Y. Garage.
Washington Auto Station.—5031 Cottage Grove Ave., Chicago, Ill. Garage.
Washington, Sq. Garage.—73 S. Washington Sq., New York City. Garage.
Waterville Market Co.—White Street, Waterville, N. Y. Garage; repairing.
Watrous Automobile Co.—Main St., Elmira, N. Y. Garage.
Watson, Isaac.—Madison, N. J. Garage.
Waverly Garage.—334 Waverly Ave., Brooklyn, N. Y. Garage.
Weathers, J. F.—Columbus, Ga. Garage.
Weaver, Jos. W.—621 Spring Alley, Lebanon, Pa. Garage.
Webb & Son, W. H.—316 State St., Conneaut, O. Garage; repairing.
Webb Auto Co., A. C.—Second & Joplin St., Joplin, Mo. Garage.
Wedding, C. H.—Jerseyville, Ill. Garage.
Weed, W. S.—Ontario St., Chicago, Ill. Garage.
Wehrfreitz & Waldo.—150 Mulberry St., Newark, N. J. Garage.
Wehrle, R. L.—South Norwalk, Conn. Garage.
Weir Cycle & Gun Co.—106 W. 1st Ave., Monmouth, Ill. Garage.
Welch Bros. Motor Car Co.—Grand Ave., cor. 7th St., Milwaukee, Wis. Garage; repairs; supplies. (Locomotive, Packard, Pope-Hartford, Woods.)
Wells Auto Co., G. A.—Garage.
Wenne, E. H.—West Ore. Garage.
Wentworth Auto Station.—Dover, N. H. Garage. (Reo, Premier, Wayne)
Werner, W.—401 North Easton, Pa. Garage.
Wertz, Charles.—113 S. Mary's, Ohio. Garage.

GARAGES (Continued)

- Westchester Motor Car Co.**—124-126 Main St., near Franklin Ave., New Rochelle, N. Y. Garage; repairs; supplies.
- West End Auto Garage Co.**—1435 Washington St., West Newton, Mass. Garage.
- West End Automobile Palace.**—202 W. 89th St., New York City. Garage.
- West End Garage.**—266 W. 135th St., New York City. Garage.
- West End Garage.**—Long Branch, N. J. Garage.
- Westergard, Wm. J.**—Valley City, N. Dak. Garage.
- Westerly Garage, The.**—88 Main St., Westerly, R. I. Garage; repairing; supplies.
- Western Garage.**—218 S. 40th St., Philadelphia, Pa. Garage.
- Western Motor Car Co.**—415 S. Hill St., Los Angeles, Cal. Garage; repairing. (Packard, Thomas, Stevens-Duryea.)
- Western Motor Co.**—Logansport, Ind. Garage.
- Westfield Auto Station.**—95 Elm St., Westfield, Mass. Garage.
- Westlake Garage Co., Inc.**—660 S. Alvarado St., Los Angeles, Cal. Garage.
- Weston, H.**—Jacksonville, Fla. Duval Garage.
- West's Garage.**—Cor. Milton Ave. & Front St., Ballston Spa, N. Y. Garage; repairing.
- West, W. E.**—833 W. Myrtle St., San Antonio, Tex. Garage.
- Wheeler, B.**—Standfordville, N. Y. Garage.
- White Automobile Agency.**—1116 Main St., Buffalo, N. Y. Garage; supplies. (White.)
- White Auto Station.**—26 Sabin St., Providence, R. I. Garage.
- White, Blakeslee Mfg. Co.**—Birmingham, Ala. Garage.
- White Co.**—Detroit, Mich. Garage.
- White Co., H. C.**—North Bennington, Vt. Garage.
- White Garage.**—Coronado, Cal. Garage.
- White Garage.**—1010 Morton St., Baltimore, Md. Garage. (White.)
- White Garage.**—Petersboro, N. H. Garage.
- White, J. Bartlett.**—Waltham, Mass. Garage.
- White, J. W.**—543 Broad St., Augusta, Me. Garage.
- White Plains Garage.**—2-4 Mamaroneck Ave., White Plains, N. Y. Garage; supplies.
- Whiting & Mudgett.**—Santa Cruz, Cal. Garage.
- Whitmore, E. T.**—750 Main St., Williamantic, Conn. Garage.
- Whitney Bros.**—Wellesley Hill Square, Wellesley, Mass. Garage.

GARAGES (Continued)

- Whittemore, C. C.**—123 W. Eagle St., Buffalo, N. Y. Garage.
- Whyte Auto Station, C. F.**—109 Waverley St., South Framingham, Mass. Garage.
- Wicke, J. A.**—Van Horne, Iowa. Garage; repairing. (Moline.)
- Wick, H. B.**—Elyria, Ohio. Garage.
- Wightman, Elmer.**—Tulare, Cal. Garage.
- Wight, W. W.**—Cornwall, Cal. Garage. (Rambler.)
- Wilcox, W. A.**—Westbrook, Conn. Garage.
- Wildman's Auto Garage.**—Belmar, N. J. Garage.
- Wilksburg Automobile Garage.**—819 Hay St., Pittsburg, Pa. Garage. (Elmore.)
- Wilkinson, E. J.**—617 Clinton St., Fort Wayne, Ind. Garage.
- Willard, Clare.**—Allegany, N. Y. Garage.
- Williamsburg Auto & Storage Co.**—159-161 Clymer St., near Bedford Ave., Brooklyn, N. Y. Garage. (Autocar.)
- Williams Motor Car Co.**—Akron, O. Garage.
- Williston Cycle Agency.**—Williston, Md. Garage.
- Willys-Crew Motor Car Co.**—117-119 Main St., Elmira, N. Y. Garage; repairing; supplies. (Rambler, White, Premier, Pope-Waverley, Ford, American.)
- Wilson, C. A.**—South Bethlehem, Pa. Garage.
- Wilson, C. D. & Parish, L. M.**—Hamilton, Ohio. Garage.
- Wilson's Garage.**—Wells, Me. Garage.
- Wilson, T. H.**—215 Seneca St., Canajoharie, N. Y. Garage.
- Winchendon Auto Transit Co.**—Winchendon, Mass. Garage.
- Winchester Automobile Co.**—Winchester, Mass. Garage.
- Windsor Auto Co.**—115 W. 37th St., New York City. Garage.
- Winn, C. H.**—621 South St., Peekskill, N. Y. Garage.
- Winton Motor Carriage Co.**—Broadway and 70th St., New York City. Garage. (Winton.)
- Winton Motor Carriage Co.**—Baltimore, Md. Garage. (Winton.)
- Winton Motor Carriage Co.**—715 E. Pine St., Seattle, Wash. Garage. (Winton.)
- Winton Motor Carriage Co.**—San Francisco, Cal. Garage. (Winton.)
- Winton Motor Carriage Co.**—248-252 Jefferson Ave., Detroit, Mich. Garage. (Winton.)
- Winton, Motor Carriage Co.**—Pittsburg, Pa. Garage. (Winton.)

GARAGES (Continued)

- Winton Motor Carriage Co.**—1 Stanhope St., Boston, Mass. Garage. (Winton.)
- Winton Motor Carriage Co.**—1259 Michigan Ave., Chicago, Ill. Garage. (Winton.)
- Winton Motor Carriage Co.**—246 Broad St., Philadelphia, Pa. Garage; repairing. (Winton.)
- Wisconsin Wagon Co.**—Madison, Wis. Garage.
- Witter & Hock**—Storm Lake, Iowa. Garage.
- Woelk, W. N. Jr.**—Larned, Kan. Garage.
- Wolfe, W. H. & L. C.**—1011 Chestnut St., Altoona, Pa. Garage; repairing. (Thomas. Winton, Studebaker, Pope-Toledo, Autocar, Buick.)
- Wolf, J. Lindgren, & Weber, M.**—La Porte, Ind. Garage.
- Wolf, M. L.**—710 Gay St., Knoxville, Tenn. Garage; repairing.
- Wolf, Pederson Automobile & Machine Co.**—1219 Devon Ave., Chicago, Ill. Garage.
- Wolverine Auto & Commercial Vehicle Co.**—Dundee, Mich. Garage.
- Wood, Allan.**—Coudersport, Pa. Garage.
- Wood Automobile Co., Frank B.**—60-62 River St., Elgin, Ill. Garage; repairing. (Ford, Rambler, Kisselkar.)
- Wood Bros.**—Santa Cruz, Cal. Garage.
- Woodin, C. D.**—St. Joseph, Mich. Garage.
- Wood, J. Elmer.**—Beverly, Mass. Garage; repairing. (Sterling.)
- Woodland Auto Garage.**—6430 Jackson Park Ave., Chicago, Ill. Garage.
- Woodland Garage.**—Woodland, Cal. Garage.
- Woodlawn Auto Station.**—6310 Woodlawn Ave., Chicago, Ill. Garage.
- Woodmont Garage & Livery.**—Woodmont, Conn. Garage.
- Wood, Redington Machinery Co.**—Cota & Anacapa Sts., Santa Barbara, Cal. Garage.
- Woodward, Reopell Co.**—Springfield, Mass. Garage; repairing. (Stoddard-Dayton.)
- Woodworth Bros.**—2 Hartford St., Newton Highlands, Mass. Garage.
- Worthern, J.**—Concord, N. H. Garage. (Holsman.)
- Wright, Elson, Jr.**—141 North Blvd., Oak Park, Ill. Garage.
- Wright, H. E.**—11 S. Main St., West Bethlehem, Pa. Garage.
- Wright, H. E.**—33 Vineyard Ave., Bethlehem, Pa. Garage.
- Wright, L. W.**—South Norwalk, Conn. Garage.
- Wyckoff, Church & Partridge.**—Broadway, at 56th St., New York City. Garage; repairing; supplies. (Stearns.)

GARAGES (Continued)

- Wyett, C. E.**—47 W. Main St., Newark, Ohio. Garage.
- Wyldo & McInnis.**—Belvidere, Ill. Garage.
- Wynkoop, Theo.**—406 Main St., Catskill, N. Y. Garage.

X

- Xander Machine & Supply Co.**—926 Bingham St., Reading, Pa. Garage; repairing.

Y

- Yonkers Auto Station.**—71-73 S. Broadway, Yonkers, N. Y. Garage; repairs. (Locomobile, Maxwell.)
- York County Garage.**—Mechanic St., Sanford, Me. Garage; repairing. (Stevens-Duryea, Stanley, Cadillac, Buick.)
- Yorkville Auto Station.**—285 E. 88th St., New York City. Garage.
- Yorkville Central Garage, Inc.**—205-209 E. 86th St., New York City. Garage.
- Yorton, J. H.**—413 S. State St., Syracuse, N. Y. Garage.
- Youlden, Geo. A.**—Ware, Mass. Garage.
- Young, Geo. A.**—51 Coyle St., Woodford, Me. Garage.
- Young's Auto Garage.**—Long Branch, N. J. Garage.
- Youngs, H. M.**—Sag Harbor, N. Y. Garage.
- Youse, Ed. S.**—46 N. 5th St., Reading, Pa. Garage; repairing. (Reo, Rambler, Premier.)

Z

- Zacharias, C. R.**—Eagle Hall, Main St., cor. Sewall Ave., Asbury Park, N. J. Garage; repairing.
- Zavala, Adolfo S.**—en Calle 55, esquina de 64, Merida, Yucatan, Mexico. Garage.
- Zerbel & Mulkern.**—225 Grand Ave., Milwaukee, Wis. Garage.
- Zimmerman, Smith Co.**—North Tawanda, N. Y. Garage.

GASKETS

- Booth, N. E.**—743-45 39th St., Brooklyn, N. Y.
- Gasket Supply Co.**—1516 Sansom St., Philadelphia, Pa.
- Globe Machine & Stampine Co.**—2862 Hamilton Ave., N. E., Cle
- Goodwin & Kintz C**—Winsted, Conn.
- Guillott Metal Gasket**—St., Chicago, Ill.
- Herz & Co.**—203-20 York City.
- Johns-Manville Co.,**—St., New York City.
- McCord & Co.**—1400 Old C., Chicago, Ill.

GASKETS (Continued)

- Morse, R. F.**—74 Weybossët St., Providence, R. I.
New Jersey Asbestos Co.—Camden, N. J.
New Jersey Car Spring & Rubber Co.—Wayne & Brunswick Sts., Jersey City, N. J.
New York Asbestos Mfg. Co.—123 Cortland St., New York City.
Smooth-on Mfg. Co.—572 Communipaw Ave., Jersey City, N. J.
United States Indestructible Gasket Co.—16 S. William St., New York City.
United States Mineral Wool Co.—140 Cedar St., New York City.

GATES—DRIVEWAY

- Manlove Gate Co.**—272 Huron St., Chicago, Ill.

GAUGES, CYLINDER COMPRESSION, see METERS, CYLINDER COMPRESSION

GAUGES—AIR, STEAM AND PRESSURE

- American Steam Gauge & Valve Co.**—220 Camden St., Boston, Mass.
American Steam Gauge & Valve Mfg. Co.—Jamaica Plains, Boston, Mass.
Ashcroft Mfg. Co.—87 Liberty St., New York City.
Ashton Valve Co.—271 Franklin St., Boston, Mass.
Auto Novelty Co.—Milwaukee, Wis.
Belfield & Co., H.—Philadelphia, Pa.
Bourdon, Edouard.—74 faubourg du Temple, Paris, France.
Buisson, Gustave Adolph.—1 rue Amelot, Paris, France.
Carpenter, J.—20 rue Delambre, Paris, France.
Cowey Engineering Co., Ltd.—1 Albermarle St., Piccadilly, London, W., England.
Crosby Steam Gauge & Valve Co.—97 Oliver St., Boston, Mass.
Davenport & Co., G.—108 Hatton Garden, London, England.
Decoudun, J.—101 rue du Faubourg, St. Denis, Paris, France.
Demaretz et Cie., G.—208 rue St. Maur, Paris, France.
Ducomet.—11 rue d'Abbeville, Paris, France.
Edt, J. C.—Cannstadt, bei Stuttgart, Germany.
Depth Gauge Co.—120 Liberty New York City.
& Leland Mfg. Co.—Hibbard Ave., rings, N. Y.
 —54 bvd. Richard-Lenoir, nce.
gan & Co., J. E.—211-15 Race St., adelphia, Pa.
nt, L.—38 rue Belgrand, Paris, nce.

GAUGES—AIR, STEAM AND PRESSURE (Continued)

- Pittsburg Gauge & Supply Co.**—309 Water St., Pittsburg, Pa.
Roberts-Gripwell Works.—St. Mary's Row, Birmingham, England.
Ross Engineering Co.—19 S. Jefferson St., Chicago, Ill.
Schaeffer & Budenberg Mfg. Co.—Foxboro, Mass.
Schaeffer et Budenberg, Société Anonyme.—105 bvd. Richard Lenoir, Paris, France.
Schaeffer und Budenberg.—Buckau, Madgeburg, Germany.
Schubert, Max.—Chemnitz, Germany.
Société Parisienne.—10 ave de la Grand Armée, Paris, France.
Standard Gauge Mfg. Co.—Industrial Bldg., Syracuse, N. Y.
Ward & Goldstone.—Springfield Lane, Salford, Manchester, England.

GAUGES—WATER

- Ashton Valve Co.**—271 Franklin St., Boston, Mass.
Kitts Mfg. Co.—111-15 Water St., Oswego, N. Y.
Knowlson & M'Conihe.—65 River St., Troy, N. Y.
McRae & Roberts Co.—227-235 Campbell Ave., Detroit, Mich.
Penberthy Injector Co.—Detroit, Mich.
Pittsburg Gauge & Supply Co.—309 Water St., Pittsburg, Pa.
Reliable Water Gauge Co.—1616 Pine St., St. Louis, Mo.
Reliance Gauge Column Co., The.—45 E. Prospect St., Cleveland, O.
Schaeffer & Budenberg Mfg. Co.—Foxboro, Mass.
Standard Gauge Mfg. Co.—Industrial Bldg., Syracuse, N. Y.

GAUGES—GASOLINE TANK

- American Steel Barrel Co.**—204-206 Varet St., Brooklyn, N. Y.
Auto Pump Co.—Springville, N. Y.
Blood Bros. Machine Co.—Kalamazoo, Mich.
Boston Auto Gauge Co.—613 Old South Blvd., Boston, Mass.
Connecticut Telephone & Electric Co., Inc.—70 Britannia St., Meriden, Conn.
Emergency Wheel & Novelty Co.—Port Huron, Mich.
Freer Gauge Co.—Everett Bldg., Akron, Ohio.
Gilbert & Barker Mfg. Co.—80-82 4th Ave., New York City.
Hans Co., Edmund E.—Minneapolis, Minn.
Ohio Brass Co.—Mansfield, Ohio.
Schaeffer & Budenberg Mfg. Co.—Foxboro, Mass.

GAUGES—GASOLENE TANK
(Continued)

- Simmons Co., John.**—104-10 Center St., New York City.
Webster Mfg. Co.—149 Jefferson Ave., Detroit, Mich.
Webster Mfg. Co.—Keany Sq. Bldg., Boston, Mass.
Wray Pump & Register Co.—191-93 Mill St., Rochester, N. Y.

GEAR-CUTTERS—AUTOMATIC

- Becker, Brainard Milling Machine Co.**—110 Business St., Hyde Park, Mass.

GEARS—DIFFERENTIAL

- Albany Mfg. Co., Ltd.**—Cumberland Park, Willesden Junction, London, England.
Anglian Motor Co., Ltd.—Beccles, Suffolk, England.
Ateliers, F. R. M.—Sclessin, Liege, Belgium.
Bozier.—7 rue Dennis-Papin, Puteaux, France.
Brown-Lipe Gear Co.—208 S. Geddes St., Syracuse, N. Y.
Bultman Co., F. H., The.—2108 Superior Ave. Viaduct, Cleveland, Ohio.
Compagnie de Constructions Mécaniques.—Berchem-Anvers, Belgium.
Cotta, Chas.—Rockford, Ill.
Cullman Wheel Co.—1030 Dunning St., Chicago, Ill.
Currier, Gardiner & Bullis.—Coudersport, Pa.
Dresse et Cie., J.—99 rue de la République. St. Mandé, Seine, France.
Garford Co.—Elyria, Ohio.
Gauthier Frères.—38 rue Balay, St. Étienne, France.
Glaenzer et Cie.—35 bvd. Strasbourg, Paris, France.
Hedgeland Mfg. Co.—Canton, O.
Langdon Motor Co., Ltd.—101 Southwark St., London, S. E., England.
Malicet et Blin, Établissements.—103 ave de la République, Aubervilliers, Seine, France.
Maschinenfabrik Prometheus.—Berlin-Reinickendorf, Germany.
Motorfahrzeugfabrik Heinle und Weiss.—Oberhausen-Augsberg, Germany.
Motorfahrzeugfabrik Köln.—Marsiliusstrasse 20, Köln-Sülz, Germany.
Muncie Gear Works.—801 E. Charles St., Muncie, Ind.
Nagant Frères.—44 quai de la Coromueuse, Liege, Belgium.
Nuttall Co., R. D.—Fayette St. & Garrison Way, Pittsburg, Pa.
Palous und Beuse.—Zimmerstrasse 30, Berlin, Germany.
Schmelz, C.—40 ave Parmentier, Paris, France.

GEARS—DIFFERENTIAL (Cont.)

- Vogel und Prein.**—Hagen im Westfalia, Germany.
Wabash Gear Works.—Terre Haute, Ind.

GEARS—MARINE REVERSE

- Alexander & Co.**—72 W. Monroe St., Chicago, Ill.
Beverly Mfg. Co.—Beverly, Mass.
Carlyle, Johnson Machine Co., The.—356 Asylum St., Hartford, Conn.
Cross Engine Co., M. O.—800-806 Bellevue Ave., Detroit, Mich.
Gies Gear Co.—345-47 Bellevue Ave., Detroit, Mich.
Perfection Reversing Gear & Supply Company.—45 Vesey St., New York City.
Snow & Petrelli Mfg. Co., The.—New Haven, Conn.

GEARS—METAL

- Adapt Machinery Co.**—1624-34 Wabash Ave., Chicago, Ill.
Arthur Co., The.—188 Front St., New York City.
Boston Gear Works.—Norfolk Downs, Mass.
Cramp & Sons Ship & Engine Building Co.—Philadelphia, Pa.
Eberhardt Bros. Machine Co.—66-68 Union St., Newark, N. J.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Horsburg & Scott Co.—Cleveland, Ohio.
McCutchen Gear & Mfg. Co.—205 W. South St., Indianapolis, Ind.
Mutual Machine Co.—25 Wells St., Hartford, Conn.
New Process Raw Hide Co.—500-514 Plum St., Syracuse, N. Y.
Parker, Surry.—Pinetown, N. C.
Sier Bath Co.—143 W. 54th St., New York City.
Throop Perforating Co.—80 Terrace, Buffalo, N. Y.
Van Dorn & Dutton Co., The.—2714 E. 79th St., Cleveland, Ohio.
Wabash Gear Works.—Terre Haute, Ind.
Widmer Machine Works.—43-47 Fort St., E. Detroit, Mich.
Worcester Steel Foundry Co.—Millbury, Mass.

GEARS—RAWHIDE

- Chicago Rawhide Mfg. Co.**—75-77 Ohio St., Chicago, Ill.
Munson Belt Co., Chas.—88 Franklin St., Chicago, Ill.
New Process Rawhide Co.—500-514 Plum St., Syracuse, N. Y.
Nuttall Co., R. D.—Fayette St. & Garrison Way, Pittsburg, Pa.

GEARS—RAWHIDE (Continued)

- Picrome Hide Co.**—1417 N. Salina St., Syracuse, N. Y.
Syracuse Rawhide Mfg. Co.—Niagara & Shonnard Sts., Syracuse, N. Y.
Widmer Machine Works.—43-47 Fort St., Detroit, Mich.

GEARS—STEERING

- Albany Mfg. Co., Ltd.**—Cumberland Park, Willesden Junction, London, England.
American & British Mfg. Co.—Bridgeport, Conn.
American Ball Bearing Co.—Edgewater Park & L. S. & M. S. Ry., Cleveland, Ohio.
Ashley Machine Works.—714 University Ave., Rochester, N. Y.
Barnes Gear Co.—Oswego, N. Y.
Blood Bros. Machine Co.—Kalamazoo, Mich.
Borbein Auto Co.—9109-11 N. 9th St., St. Louis, Mo.
Bowen Patents Syndicate, Ltd., E. M.—Baldwins Gardens, Grays Inn Rd., London, E. C., England.
Brown-Lipe Gear Co.—208 S. Geddes St., Syracuse, N. Y.
Bultman Co., The F. H.—2108 Superior Avenue Viaduct, Cleveland, Ohio.
Cambria Forge Co.—Cleveland, Ohio, and Johnstown, Pa.
Cohendet et Cie., A.—166 quai Jemappes, Paris, France.
Columbus Screw & Machine Co.—Columbus, O.
Elyria Machine Parts Co.—Elyria, Ohio.
Fournier et Pionchon.—42 Bis, rue de Sevastopol, Lyon, France.
Gemmer Mfg. Co.—Detroit, Mich.
Hartford Auto Parts Co.—Howard Bldg., Hartford, Conn.
Jamesville Mfg. Co.—Jamesville, N. Y.
Janssens, Ateliers A.—rue du Gazometre, St. Nicholas, Belgium.
Konigslow Mfg. Co., Otto.—2279 Clarkwood Road, Cleveland, Ohio.
Malicet et Blin, Etablissements.—103 ave de la République, Aubervilliers, Seine, France.
McCutcheon Gear & Mfg. Co.—205 W. South St., Indianapolis, Ind.
Mfg. Co.—944-48 Dorchester, Boston, Mass.
Verrett, Mass.
ts Co.—Elliot & L. E. cie, Ind.
-Mansfield, Ohio.
Beuse.—Zimmerstrasse 30, Germany.
es.—59 rue Chauveau, Neu-Seine, France.
achine Co.—12-16 Gratiot Ave., roit, Mich.

GEARS—STEERING (Continued)

- Ravel et Homeyer.**—114 rue d'Annonay, St. Etienne, France.
Smith, Chas. A.—Church Lane & P. & R. Ry., Germantown, Philadelphia, Pa.
Timken Roller Bearing Axle Co.—Canton, Ohio.
Vogel und Prein.—Hagen, Germany.
Warner Gear Co.—Muncie, Ind.

GEARS—TRANSMISSION

- Advance Mfg. Co.**—B St., 2 Blocks N. of Main St., Hamilton, Ohio.
American Die & Tool Co.—Reading, Pa.
Baker, Jos. and Sons, Ltd.—Hythe Road, Willesden Junction, London, England.
Belden Auto Transmission Co.—1005 Bessemer Bldg., Pittsburg, Pa.
Bendix Co., The.—2107 N. 9th St., Chicago, Ill.
Besse, Louis.—39 rue de Lappe, Paris, France.
Beverly Mfg. Co.—Beverly, Mass.
Boxier.—7 rue Denis-papin, Puteaux, France.
Brownell Motor Co., F. A.—634-6 Lexington Ave., Rochester, N. Y.
Brown-Lipe Gear Co.—208 S. Geddes St., Syracuse, N. Y.
Bultman Co., F. H., The.—2108 Superior Avenue Viaduct, Cleveland, Ohio.
Caffert Frères.—125 bis, rue de Chemin Vert, Paris, France.
Carlyle Johnson Machine Co., The.—356 Asylum St., Hartford, Conn.
Cassady Fairbank Mfg. Co.—6106-30 La Salle St., Chicago, Ill.
Chater Lea, Ltd.—114 Golden Lane, London, E. C., England.
Clark Motor Co., E. C.—Jackson, Mich.
Cohendet et Cie.—166 quai Jemappes, Paris, France.
Compagnie de Constructions Mecaniques.—80 rue Jan-Breydel, Berchem-Anvers, Belgium.
Continental Motor Mfg. Co.—Muskegon, Mich.
Cotta, Chas.—Rockford, Ill.
Covert Motor Vehicle Co.—57-61 Richmond Ave., Lockport, N. Y.
Cross Engine Co., M. O.—800-806 Bellevue Ave., Detroit, Mich.
Degaille.—85 rue Ménilmontant, Paris, France.
Dempster Machine Co., W. R., The.—16th & Walnut Sts., Kansas City, Mo.
Dresse et Cie., J.—99 rue de la République, St. Mandé, Seine, France.
Foot Bros. Gear & Machine Co.—24 S. Clinton St., Chicago, Ill.
Fort Wayne Gear Co.—North American Bldg., Fort Wayne, Ind.
Furan, Société des Ateliers du.—4 rue Barrouin, St. Etienne, Paris, France.
Garford Co.—Elyria, Ohio.

GEARS—TRANSMISSION (Cont.)

Gautier, Paul.—11 rue Taine, Paris, France.
Gearless Transmission Co.—Rochester, N. Y.
General Manufacturing Co.—Elkhart, Ind.
Gottschalk und Co.—Reinickendorferstrasse 66, Berlin, Germany.
Hatcher Auto Parts Co.—Cleveland, O.
Hyatt Roller Bearing Co.—427 Middlesex St., Harrison, N. J.
Kalb & Berger Mfg. Co., Inc.—1565 Broadway, New York City.
Kirkham Motor Mfg. Co.—Bath, N. Y.
Langdon Motor Co., Ltd.—101 Southwark St., London, S. E., England.
Lauth & Co., J.—528 Elston Ave., Chicago, Ill.
Lee Mfg. Co., The.—Conners St., Port Huron, Mich.
Long Arm System Co.—Lakeside Ave. & E. 38th St., Cleveland, Ohio.
Malicet et Blin, Établissements.—103 ave de la République, Aubervilliers, France.
Manning Transmission Co., E. H.—Elkhart Ind.
Martin, L.—place Pereire, St. Germain-en-Laye, Seine-et-Oise, France.
Maschinefabrik Prometheus.—Berlin, Reinickendorf, Germany.
Meisel Press & Mfg. Co.—944-948 Dorchester Ave., Boston, Mass.
Merchant & Evans Co.—517 Arch St., Philadelphia, Pa.
Milwaukee Auto Engine Supply Co.—706-708 Winnebago St., Milwaukee, Wis.
Milwaukee Motor Co.—615 Clyborn Ave., Milwaukee, Wis.
Motorfahrzeugfabrik Köln.—20 Marsiliustrasse, Köln-Sülz, Germany.
Muncie Auto Parts Co.—Elliot St. & L. E. W. Yards, Muncie, Ind.
Nagant Frères.—44 quai la Coronmense, Liege, Belgium.
National Oil & Supply Co.—Newark, N. J.
New York Gear Works.—56 Greenpoint Ave., Brooklyn, N. Y.
Northway Motor & Mfg. Co.—Grand Ave., Detroit, Mich.
Nuttall Co., R. D.—Fayette St. & Garrison Way, Pittsburg, Pa.
Parant Frères.—59 rue Chauveau, Neuilly, Seine, France.
Puritan Machine Co.—12-16 Gratiot Ave., Detroit, Mich.
Ravel et Homeyer.—114 rue d'Annonay, St. Etienne, Paris, France.
Redington & Co., F. B.—107-109 S. Sangamon St., Chicago, Ill.
Richmond Forging Corporation.—Richmond, Va.
Riley Engine Co.—Castle Works, Coventry, England.

GEARS—TRANSMISSION (Cont.)

Roger de Montais.—Beauvior, par-St.-Jean, Froidmental, France.
Ross Gear & Tool Co.—849 Main St., Lafayette, Ind.
Royal changement de vitesse.—15 bvd. de Strasbourg, Boulogne-sur-Seine, France.
Schmelz, C.—40 ave Parmentier, Paris, France.
Shattuck Co., W. P.—2125 Girard Ave. S., Minneapolis, Minn.
Sintz, Guy L.—Fulton & Front Sts., Grand Rapids, Mich.
Smith, Chas. A.—Church Lane & P. & R. Ry., Germantown, Philadelphia, Pa.
Smith Co., A. O.—Park & Clinton Sts., Milwaukee, Wis.
Spacke Machine Co., The F. W. S.—Indianapolis, Ind.
Sturtevant Mill Co.—Harrison Sq., Boston, Mass.
Throop Perforating Co.—80 Terrace, Buffalo, N. Y.
Virtue & Pound Mfg. Co.—Owatanna, Minn.
Waukesha Motor Co.—110 North St., Waukesha, Wis.
Westerfield Motor Co.—1525 S. Main St., Anderson, Ind.
Willis Co., E. J.—8 Park Place, New York City.

GENERATORS—ELECTRIC

Dayton Electrical Mfg. Co.—87 St. Clair St., Dayton, O.
Eck Dynamo Motor Co.—Belleville, N. J.
Eddy Electric Mfg. Co.—Windsor, Conn.
Elbridge Electric Co.—Elbridge, N. Y.
Engineering Specialty Co., Inc.—143 Liberty St., New York City.
General Electric Co.—Lynn, Mass.
Holtzer-Cabot Electric Co.—Brookline, Mass.
Lamb Electric Co.—31 Canal St., Grand Rapids, Mich.
Lincoln Electric Co.—1-3 Union Square, New York City.
Milwaukee Electric Co.—Milwaukee, Wis.
New England Motor Co.—Liberty Sq., Lowell, Mass.
Roth Bros. & Co.—S. Clinton St., Chicago, Ill.
Sprague Electric C
 New York City.
Sterling Electric Mo
 Ohio.
Wagner Electrical Mfg. C
 Mo.
Westinghouse Electric &
 Pittsburg, Pa.
Witherbee Mfg. Co., Inc.—433 St., New York City.

GENERATORS—ACETYLENE

Acetylene Gas Ill. Co.—105 Walker St., New York City.
Acetylene Co.—38 Park Row, New York City.
American Auto Brass Co.—181 W. Maple St., Columbus, Ohio.
American Lamp Co.—255 Jefferson Ave., Detroit, Mich.
Atwood Mfg. Co.—Amesbury, Mass.
Badger Brass Mfg. Co.—11th Ave. & 36th St., New York City, and Kenosha, Wis.
Bridgeport Brass Co.—Bridgeport, Conn.
Brown Mfg. Co., J. B.—Columbus, Ohio.
Chicago Auto Lamp Works.—71 W. Jackson Blvd., Chicago, Ill.
Dietz Co., R. E.—33 Laight St., New York City.
Eco Mfg. Co.—53 State St., Boston, Mass.
Edmunds & Jones.—315 Riopelle St., Detroit, Mich.
Gray & Davis.—Amesbury, Mass.
Gray & Sons, Peter.—90 Union St., Boston, Mass.
Hauck-Seebach Co.—291-95 Essex St., Brooklyn, N. Y.
Hine, Watt Mfg. Co.—60 Wabash Ave., Chicago, Ill.
Kimball Co., E. T.—Motor Mart, Boston, Mass.
Manhattan Lamp Works.—530 W. 28th St., New York City.
Manhattan Screw & Stamping Works.—West End Ave. & 67th St., New York City.
Moore & Son, M. E.—Westfield, Mass.
New York Coach & Auto Lamp Co.—794-98 Tenth Ave., New York City.
Peterson Mfg. Co., O. W.—1254 Michigan Ave., Chicago, Ill.
Pinkus, Frederick B.—103 Franklin St., New York City.
Pyle Mfg. Co.—2211 Park Ave., Indianapolis, Ind.
Rose Mfg. Co.—910 Arch St., Philadelphia, Pa.
Rushmore Dynamo Works.—Plainfield, N. J.
Saxon Lamp Co.—526-32 W. 28th St., New York City.
Scoville & Peck.—15 Wooster St., New Haven, Conn.
Standard Lamp Co.—43 S. Canal St., Ill., and Charlotte, Mich.
Co., F. Cortez.—239-41 Lake St., Ill.

**WEARING APPAREL,
AND GAUNTLETS**

LES, see SHIELDS, EYE

GRAPHITE

rucible Co., Jos.—Jersey City, N. J.

GRAPHITE (Continued)

Holmes Fibre Graphite Co.—5155 Wakefield St., Philadelphia, Pa.
National Cement & Rubber Mfg. Co.—3053-59 Monroe St., Toledo, Ohio.
Obermayer Co., S.—641 Evans, Cincinnati, Ohio.
United States Graphite Co.—Saginaw, E. S., Mich.
Wisconsin Graphite Co.—Allegheny, Pa.

GREASE

Acme Oil & Supply Co.—345 S. Canal St., Chicago, Ill.
American Oil Co.—170-78 S. Water St., Jackson, Mich.
Annis Oil Co., N. L.—139 Potomac Ave., Buffalo, N. Y.
Baum's Castorine Co.—104 W. George St., Rome, N. Y.
Borne-Scrymser Co.—Claremont, N. J.
Columbia Lubricants Co. of New York.—78 Broad St., New York City.
Dixon Crucible Co., Jos.—Jersey City, N. J.
Downing Grease Co.—14 Waltham St., Boston, Mass.
Draper Co., Walter H.—120 S. Railroad Ave., Mt. Vernon, N. Y.
Eagle Oil & Supply Co.—104 Broad St., Boston, Mass.
Economy Oil & Compound Co.—442 Clark St., Chicago, Ill.
Emery Mfg. Co.—Bradford, Pa.
Fiske Bros. Refining Co.—13-15 Oldslip, New York City.
Galloway, G. W.—322 Pearl St., New York City.
Harris Oil Co., A. W.—330 Water St., Providence, R. I.
Havemeyer Oil Co.—80 Broad St.; 1906 Broadway, New York City.
Haws, George A.—73 Pine St., New York City.
Hosmer Co., G. A.—601-607 Northland Ave., Buffalo, N. Y.
Kellogg & Co., E. H.—243-244 South St., New York City.
Keystone Lubricating Co.—20th & Allegheny Aves., Philadelphia, Pa.
Magie Bros.—9-11 N. Canal St., Chicago, Ill.
Millers Sons, Wm. P.—73-79 3rd St., Long Island City, N. Y.
Monarch Mfg. Co.—Toledo, Ohio.
Mound City Oil & Supply Co.—204 N. Commercial St., St. Louis, Mo.
National Cement & Rubber Mfg. Co.—3053-59 Monroe St., Toledo, Ohio.
National Oil & Supply Co.—Newark, N. J.
Northrop Lubricating Oil Co.—308 N. Commercial St., St. Louis, Mo.
Oil City Oil & Grease Co.—Oil City, Pa.
Paragon Refining Co., The.—Toledo, Ohio.

GREASE (Continued)

Philadelphia Grease Mfg. Co.—The Bourse, Philadelphia, Pa.
Pigot, Sayre & Co.—135 William St., New York City.
Reliance Oil & Grease Co., The.—1501-1521 Columbus Road, Cleveland, Ohio.
Robinson, Son & Co., Wm. C.—Baltimore, Md.
Sheppard, W. S.—22 Lawrence St., Newark, N. J.
Speare's Sons & Co., The Alden.—369 Atlantic Ave., Boston, Mass.
Standard Oil Co.—26 Broadway, New York City.
Sullivan Oil Co.—Chicago, Ill.
Sweet, Charles F.—61 Market St., Hartford, Conn.
Syracuse Gear Co.—Syracuse, N. Y.
United States Graphite Co.—Saginaw, E. S., Mich.
Wisconsin Graphite Co.—Allegheny, Pa.
Young, Orlando W.—180 Frelinghuysen Ave., Newark, N. J.

GRINDERS

Bealey & Co. C. H.—15-21 S. Clinton St., Chicago, Ill.
Cincinnati Electric Tool Co.—650-652 Evans St., Cincinnati, Ohio.
Cincinnati Milling Machine Co.—Cincinnati, Ohio.
Gisholt Machine Co.—1300 Washington Ave., Madison, Wis.
Wilmarth & Morman Co.—585 Canal St., Grand Rapids, Mich.

GRINDERS—VALVE

Jef Mfg. Co.—1562 Broadway, Denver, Colo.

GRIPS, CHAIN, see CHAINS, TIRE

GUARDS—MUD

American Veneer Co.—Kenilworth N. J.
Auto Body Co.—Franklin Ave., Lansing, Mich.
A. Z. Co., The.—527 W. 56th St., New York City.
Bridgeport Vehicle Co.—Water & South Ave., Bridgeport, Conn.
Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Cole & Whoop.—48 W. 67th St., New York City.
Dann Bros. & Co., The.—84 Franklin St., New Haven, Conn.
Dover Stamping & Mfg. Co.—385 Putnam Ave., Cambridge, Mass.
Everett, B. F.—Detroit, Mich.
Folsom Mfg. Co., C. G.—South Bend, Ind.
Gray & Sons, Peter.—90 Union St., Boston, Mass.
Hall Co., Inc., E. H.—12 Elm St., Rochester, N. Y.

GUARDS—MUD (Continued)

Hayes Mfg. Co.—360-70 Maybury Ave., Detroit, Mich.
Indianapolis Dash Co.—Indianapolis, Ind.
Kells Mfg. Co., W. J.—Jersey City, N. J.
Kinsey Mfg. Co.—Dayton, Ohio.
Locke & Co.—218 W. 84th St., New York City.
Long Mfg. Co.—1430-34 Michigan Ave., Chicago, Ill.
Moore & Munger Co.—602 W. 52nd St., New York City.
Mullins Co., N. H.—Salem, O.
New York Dash & Fender Co.—516-20 West 36th St., New York City.
Off & Co., Christian.—Indianapolis, Ind.
Ohio Blower Co., The.—330 Prospect Ave., N. W., Cleveland, Ohio.
Peters & Herron Dash Co., The.—Columbus, Ohio.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
Schubert Bros. Gear Co.—42-44 Cedar St., Oneida, N. Y.
Springfield Metal Body Co.—Birney Ave., Springfield, Mass.
United States Aluminum Co.—Pittsburg, Pa.
Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill.

GUNS—OIL AND GREASE

American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill.
Elkhart Brass Mfg. Co.—Prospect St., Elkhart, Ind.
Essex Brass Co., G. B.—480 Franklin St., Detroit, Mich.
Gleason, Peters Air Pump Co.—Mercer & Houston Sts., New York City.
Hauck, Seebach Co.—291-95 Essex St., Brooklyn, N. Y.
Manhattan Screw & Stamping Works.—West End Ave. & 67th St., New York City.
McRae & Roberts Co.—227-235 Campbell Ave., Detroit, Mich.
New York & New Jersey Lubricants Co.—14 Church St., New York City.
Noera Mfg. Co.—Waterbury, Conn.
Randall-Faichney Co.—Boston, Mass.
Tucker, C. F.—Hartford, Conn.
Winkley Co.—Abbot St., Detroit, Mich.

H...

Armour & Co.—
Baeder, Adamson
 St., New York
Bentley Hair Co.,
 Mass.
Mitchell Co., P. R
 Harrison Ave., Cincinnati
Roehm & Davidson,
 Woodbridge St., Detroit, Mich.
Schofield, Mason & Co.—Fair...
 & Cumberland Sts., Philadelphia

HAMPERS, see BASKETS, AUTO-MOBILE

HARDWARE—TOP AND BODY

Aetna Brass Mfg. Co.—4800 Hamilton Ave., Cleveland, O.
Belden Machine Co.—Whalby Ave. & Tyron St., New Haven Conn.
Blakeslee Forging Co.—Plantsville, Conn
Imperial Brass Mfg. Co.—245-47 S. Jefferson St., Chicago, Ill.
Patterson, Gottfried & Hunter, Ltd.—146-50 Center St., New York City.
Seward & Son Co., M.—New Haven, Conn.
Spring Perch Co.—232 John St., Bridgeport, Conn.
Wing & Co., Chas.—Amesbury, Mass.
Woodruff & Sons Co., Walter W.—Mount Carmel, Conn.

HARVESTERS, see IMPLEMENTS, AGRICULTURAL

HATS, see WEARING APPAREL, HATS AND CAPS

HEATERS—AUTOMOBILE

Chicago Auto Heater Co.—285 N. State St., Chicago, Ill.
Chicago Flexible Shaft Co.—La Salle & Ontario Sts., Chicago, Ill.
Lehrman Bros.—10 Bond St., New York City.
Motor Car Heater Co.—21 Quincy St., Chicago, Ill.
National Casket Co.—New York City, Boston, Philadelphia, Baltimore, Pittsburgh, Nashville, Louisville, Indianapolis, Rochester, Buffalo, Albany, Chicago.
Novelty Mfg. Co.—Jackson, Mich.
Progress Mfg. Co.—12 S. Poplar St., Pana, Ill.
Standard Stamping Co.—Marysville, O.

HEATERS—TORCH

Clayton & Lambert Mfg. Co.—Detroit, Mich.
Foster & Brown.—Westbrook, Me.
Kero-Steam Co. (Waite & Son Co.)—102 Fulton St., New York City. Factory, East Orange, N. J.
Marion Mfg. Co.—Franklin, Pa.
Wallace, W. M.—616 18th St., N. W., Washington, D. C.

HEATEDS—FEED WATER

Kilburn, Edwin.—Spring Valley, Minn.
Offeldt & Sons, F. W.—Nyack-on-the-Hudson, N. Y.
Norris Mfg. Co.—27 Western Ave., Cambridge, Mass.
Ranlet Automobile Co.—76 Eastern Ave., St. Johnsbury, Vt.

HOISTS—ANCHOR

Camden Anchor-Rockland Machine Co.—Camden, Me.

HOLDERS—TIRE

Allen Auto Specialty Co.—1931 Broadway, New York City.
American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill.
Appliance Mfg. Co.—72-86 W. Jackson Blvd., Chicago, Ill.
Harper Co., Walter J.—229-31 Mulberry St., Newark, N. J.
Hillman Plating Co.—446 Tremont St., Boston, Mass.
New Jersey Aluminum Co.—19th & Springfield Ave., Newark, N. J.
Polson, W. F.—22 W. Utica St., Buffalo, N. Y.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Schubert Bros. Gear Co.—42-44 Cedar St., Oneida, N. Y.
Smith & Co., Jos. N.—154-162 4th St., Detroit, Mich.

HOLDERS—WATCH

Cowles & Co., C.—New Haven, Conn.
English & Mersick Co.—New Haven, Conn.
Rumpp & Sons.—Philadelphia, Pa.

HOODS

A. Z. Co., The.—527 W. 56th St., New York City.
Badger & Sons Co., E. B.—63-69 Pitts St., Boston, Mass.
Bridgeport Vehicle Co.—South & Water Sts., Bridgeport, Conn.
Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Crescent Auto Top Co.—58 W. 43rd St., New York City.
Dover Stamping & Mfg. Co.—385 Putnam Ave., Cambridge, Mass.
Fedders Mfg. Co.—57-59 Tonawanda Ave., Buffalo, N. Y.
Folsom Mfg. Co., C. D.—South Bend, Ind.
Hayes Mfg. Co.—360-370 Maybury Ave., Detroit, Mich.
Kells Mfg. Co.—Jersey City, N. J.
Keystone Wagon Works.—Reading, Pa.
Kinsey Mfg. Co.—Dayton, Ohio.
Long Mfg. Co.—1430-34 Michigan Ave., Chicago, Ill.
Long-Turney Mfg. Co.—Rome, N. Y.
Mayo Radiator Co.—New Haven, Conn.
Moore & Munger Co.—602 W. 52nd St., New York City.
Mullens & Co., W. H.—Salem, Ohio.
Neustadt Auto & Supply Co.—3948-50 Olive St., St. Louis, Mo.
Noye Mfg. Co.—50 Lake View Ave., Buffalo, N. Y.
Off & Co., Christian.—Indianapolis, Ind.
Ohio Blower Co., The.—330 Prospect Ave., N. W., Cleveland, Ohio.
Whitlock Coil Pipe Co.—Elmwood St., Hartford, Conn.
Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill.

HORNS

American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill.
Appliance Mfg. Co.—72-86 W. Jackson Blvd., Chicago, Ill.
Autolyte Mfg. Co.—10-12 Thomas St., New York City.
Automobile Equipment Co.—264 Jefferson Ave., Detroit, Mich.
Automobile Supply Mfg. Co.—139-47 Emerson Pl., Brooklyn, N. Y.
Auto-Vélo.—5 rue Poisson, Paris, France.
Berton, F.—15 rue de la Cour des Noues, Paris, France.
Bowden Syndicat Francais des Brevets, Ltd.—12 ave de la Gande Armée, Paris.
Branson, Kent & Co., Ltd.—40 Great Eastern St., London, E. C., England.
Comiot, E.—87 bvd. Gouvion, St. Cyr, Paris France.
Comptoir d' Innovations Pour Automobiles.—16 Ave. de la Grande-Armée, Paris, France; U. S. Branch, 1693 Broadway, New York City.
Daveluy, A.—19 bvd. Alsace-Lorraine, Amiens, France.
Démaretz et Cie.—208 rue St. Maur, Paris, France.
Desponta.—150 rue Victor-Hugo, Paris, France.
Deutsche Signalinstrumentenfabrik, Pfretzschner und Martin.—Markneukirchen, Saxony, Germany.
Downing, Chas. J.—54 Warren St., New York City. (Selling agent and importer.)
Dupont, A.—36 quai de Suresnes, Suresnes, France.
Frank, Albert.—Beierfeld, Saxony, Germany.
Gabriel Horn Mfg. Co.—934 Hamilton Ave., N. E., Cleveland, Ohio.
Gleason, Peters Air Pump Co.—Mercer & Houston Sts., New York City.
Gray-Hawley Mfg. Co.—605-609 W. Fort St., Detroit, Mich.
Hirsch, Etienne.—26 rue de Crussol, Paris, France.
Hutchinson Electric Horn Co.—1 Madison Ave., New York City.
International Auto Horn Mfg. Co.—151 E. 126th St., New York City.
Jackson.—104 rue Oberkampf, Paris, France.
Jacob, Michel.—8 bvd. Voltair. Paris, France.
Jobusch, W.—21 Nürnbergertrasse, Berlin, Germany.
Jungmann, Felix.—Friedrichsgracht 42, Berlin, Germany.
Lafitte, J.—Biarritz. Basses-Pyrennees. France.
Legendre, A. C.—Reims. France.
Leng's Son & Co., John S.—33 Murray St., New York City.

HORNS (Continued)

Lucas, Ltd., Jos.—Great King St., Birmingham, England.
Lucke, Hermann.—Karlsruhe, Germany.
Manhattan Brass Co.—332 E. 28th St., New York City.
Manhatan Screw & Stamping Works.—West End Ave. & 67th St., New York City.
Maxant, Léon fils.—38 rue Belgrand, Paris, France.
Mestre et Blatgé.—5 rue Brunel, Paris, France.
Motor Accessories Co.—14 Dutch St., New York City.
Neue Industriewerke.—Ulm-am-Don, Germany.
New Jersey Tube Co.—Newark, N. J.
New York Coach & Auto Lamp Co.—794-98 Tenth Ave., New York City.
Officine Canavesio.—Carello, Societa Anonima.—15 corso Brescia, Turin, Italy.
Postma, J. Titus.—177 bvd. Peréire, Paris, France.
Riley-Klotz Mfg. Co.—17 Mulberry St., Newark, N. J.
Roberty, A.—115 rue de Rome, Marseille, France.
Ross Engineering Co.—19 S. Jefferson St., Chicago, Ill.
Rushmore Dynamo Works.—Plainfield, N. J.
Schildge, E.—20 rue St. Croix-de-la-Bretonniere, Paris, France.
Schoening, M. E.—369 Broadway, New York City.
Société Manufaturière d'Accessoires.—94 rue d'Angoulême, Paris, France.
Stevens & Co.—99 Chambers St., New York City.
Stewart & Clark Mfg. Co.—514 Diversey Blvd., Chicago Ill.
Sudre fils.—17 rue Clignancourt, Paris, France.
Teste, E.—18 cité Lemiére, Belleville, Paris, France.
Trinity Chimes Co., The.—29 N. Capital Ave., Indianapolis, Ind.
Tripari Bros. & V. De Presco Co.—179 Mott St., New York City.
Tyler Co., W. S.—1158 St. Clair St., Cleveland, Ohio.
Uncas Specialty Co.—1691 Broadway, New York City.
United Motor Industries, Ltd.—Sherbourne Works, Coventry, Lanes.
Vesta Accumulator Co.—13 Ave., Chicago, Ill.
Watres Mfg. Co.—1131 Bro York City.
Weiss, Louis T.—286-90 Taaf Brooklyn, N. Y.
Welfringer et Cie., L.—9 cité Lebourg, Paris, France.
Westfälische Metallindustrie Actien-schaft.—Lippstadt, Germany.

**HOUSES AND GARAGES—
PORTABLE**

American Portable House Co.—Seattle, Washington.
Burnham-Standeford Co.—Oakland, Cal.
Chicago Portable House Co.—4726 Shields Ave., Chicago, Ill.
Ducker Co.—277 Broadway, New York City.
Hodgson, E. F.—Dover, Mass.
Karr Portable House Co.—605 Bellplaine Ave., Chicago, Ill.
Keasby & Mattison Co.—Ambler, Pa.
Mershon & Morley.—Saginaw, Mich.
National Construction Co.—Buffalo, N.Y.
Phenix Mfg. Co.—Milwaukee, Wis.
Portable Construction Co.—16 S. William St., New York City.
Springfield Portable Construction Co.—Springfield, Mass.
Watermann-Hunter Co.—515 First Ave., South, N. E., Minneapolis, Minn.
Wyckoff Lumber & Mfg. Co.—Ithaca, N. Y.

HUBS

American Ball Bearing Co.—Edgewater Park & L. S. & M. S. Ry., Cleveland, O.
Auburn Ball Bearing Co.—Rochester, N. Y.
Corbin Screw Corp., The.—New Britain, Conn.
Deschler, August.—18-20 E. Water St., Chillicothe, Ohio.
Garford Co., The.—Elryia, O.
Imperial Steel Co.—218 Front St., Fremont, O.
Jamesville Mfg. Co.—Jamesville, N. Y.
Keim Mills, Inc., John R.—Kensington Ave. & Erie Tracks, Buffalo, N. Y.
Richmond Forgings Corp.—Belle Isle, Richmond, Va.
Standard Roller Bearing Co.—48th St. & Girard Ave., Philadelphia, Pa.
Weston-Mott Co.—Flint, Mich.

HYDROMETERS

Adams, A. L.—45 Salem St., Worcester, Mass.
American Thermo-Ware Co.—16 Warren St., New York City.
Greiner, Emil.—45 Cliff St., New York City.
Scheidig & Co., John.—50 Maiden Lane, New York City.
Scientific Shop, The.—1230 Monon Bldg., Chicago, Ill.
ze Battery Supply Co.—239 E. 27th New York City.
r Bros. Co.—Rochester, N. Y.
—Huntington, Pa.

IS—AGRICULTURAL

1 Mower Co.—Newburgh,
al Motors, Ltd.—45 Great
borough St., London, England.
mes, Sims & Jeffries, Ltd.—Ips-
h, England.

**IGNITION CABLE, see WIRE, IN-
SULATED**

INDICATORS—GRADE

Adams Co., The.—Dubuque, Ia.
Bellardent, A.—bvd. d'Asnières, Ville-
neuve-la-Garenne, France.
Daclin, H.—place de l'Abondance, Lyon,
France.
Willis Co., E. J.—8 Park Pl., New York
City.

INDICATORS—MILEAGE

Jones Speedometer Co.—Broadway &
76th St., New York City.
Veeder Mfg. Co.—Cor. Garden & Sar-
geant Sts., Hartford, Conn.

INDICATORS—SPEED

Ateliers des Télégraphes, G. Hasler.—
Berne, Switzerland.
Auto Improvement Co.—Factory, 316
Hudson St.; Sales and Show Rooms,
2128 Broadway, New York City.
Bara Pascault et Riga.—35 rue Victor
Massé, Paris, France.
Bourquin, Veuve Ferdinand.—10 cité
Trévis, Paris, France.
Bullard, J. H.—777 State St., Springfield,
Mass.
Chauvin et Arnoux.—186 rue Champion-
net, Paris, France.
Connecticut Gauge Co.—Norwich, Conn.
Couderc, H.—11 rue Bouret, Paris,
France.
Cowery Engineering Co.—Kew Gardens,
London, S. W., England.
Daclin, H.—place de l'Abondance, Lyon,
Farnce.
Davenport & Co.—108 Hatton Garden,
London, E. C., England.
Davis & Co., S. H.—68 Portland St.,
Boston, Mass.
Deutsche Velographfabrik Gross.—Gor-
schenstrasse 35, Berlin, Germany.
Dunhoelter et Schoelzel.—148 faubourg
St. Denis, Paris, France.
Elliott Bros., Century Works.—Lewi-
ham, England.
Elsass Elektricitatswerke, Otto Schulze.
10 bis, rue de l'arcen-Ciel, Strasbourg,
Elsass, Germany.
Garnier, P.—16 rue Taitbout, Paris,
France.
George, Albert.—67 rue du Téléphone,
Brussels, Belgium.
Gratze Patents and Engineering Syndi-
cate, Ltd.—44 Whitfield St., London,
W., England.
Hallada, G.—Dortheenstrasse 22, Berlin,
Germany.
Hirsch, Etienne.—26 rue Crossol, Paris,
France.

INDICATORS SPED (Continued)

- Hicks Speed Indicator Co.**—1384 Bedford Ave., Brooklyn, N. Y.
- Hoffecker Co., The.**—Motor Mart, Park Square, Boston, Mass.
- Internationale Taxametergesellschaft.**—79 Landsbergerstrasse, Berlin, Germany.
- Jones Speedometer Co.**—Broadway & 76th St., New York City.
- Jones, W. H.**—134 Waverly Ave., Newton, Mass.
- L'Inviolable.**—53 rue Laugier, Paris, France.
- Lipman Mfg. Co.**—300 Pleasant St., Beloit, Wis.
- Littlefield Mfg. Co., W. S.**—134 Eliot St., Boston, Mass.
- Lombardi Motor Co., The.**—Derby, Conn.
- Loring Auto Appliance Co.**—Broadway and 63d St., New York City. Factory, Somerville, Mass.
- Monitor Speed Recorder Co.**—274 Pearl St., Cambridge, Mass.
- Montandon, Robert.**—2 place de la Fus-terie, Geneva, Switzerland.
- Motor Car Specialty Co.**—112 N. Broad St., Philadelphia, Pa.
- Oliver Instrument Co.**—Hennepin & 11th Sts., Minneapolis, Minn.
- Parker Mfg. Co.**—6 Clifton St., Boston, Mass.
- Ross Engineering Co.**—19 S. Jefferson St., Chicago, Ill.
- Senn, E.**—31 rue des Tanneurs, Bale, Switzerland.
- Smith Mfg. Co., R. H.**—Springfield, Mass.
- Smith & Son, Ltd., S.**—9 Strand, London, England and 116 Broad St., New York City.
- Stewart & Clark Mfg. Co.**—514 Diversey Blvd., Chicago, Ill.
- Taxameter Westemdarf und Pieper.**—Mauerstrasse 86, Berlin, Germany.
- Warner Instrument Co.**—2022 Roosevelt Ave., Beloit, Wis.
- Webb Mfg. Co.**—60 Shipman St., Newark, N. J.
- Winchester Speedometer Co., Inc.**—Motor Mart, 62nd St. & Broadway, New York City.

INDICATORS—VEHICLE USAGE

- Jones Speedometer Co.**—Broadway and 76th St., New York City.
- Jones, Wm. S.**—12 No. Broad St., Philadelphia, Pa.
- Model Mfg. Co., The.**—15 Frankfort St., New York City.
- National Sales Corporation.**—206 Broadway, New York City.

INJECTORS

- Lee Mfg. Co., The.**—Conners St., Port Huron, Mich.

INSERTS—CORK

- Hartford Machine Screw Co.**—476 Capital Ave., Hartford, Conn.
- National Brake & Clutch Co.**—16 State St., Boston, Mass.
- Northway Motor & Mfg. Co.**—Grand Ave., Detroit, Mich.
- Standard Brake Co., The.**—101 W. 66th St., New York City.

INSULATORS—LAVA

- American Lava Co.**—27-31 William St., Chattanooga, Tenn.

INSULATORS—MICA

- Asheville Mica Co.**—Asheville, N. C.
- Mica Mfg. Co.**—307 West Broadway, New York City.
- (See also, Mica.)

INSULATORS—PORCELAIN

- Brunt Porcelain Works, G. F.**—East Liverpool, Ohio.
- Imperial Porcelain Works.**—Mulberry St. & New York Ave., Trenton, N. J.
- National Porcelain Works.**—Trenton, N. J.
- Pass & Seymour, Inc.**—52 Boyd Ave., Solvay, N. Y.
- Standard China Works.**—Trenton, N. J.
- Star Porcelain Co.**—Trenton, N. J.

INSTRUCTION—AUTOMOBILE

- Auto & Motor Co., The.**—Baltimore, Md.
- Boston Auto School.**—343 Tremont St., Boston, Mass.
- Correspondence School of Motor Car Practice.**—Tarrytown, N. Y.
- Central Automobile School.**—240 W. 50th St., New York City.
- International Correspondence School.**—Scranton, Pa.
- New York School of Automobile Engineers.**—146 W. 56th St., N. Y. City.
- Y. M. C. A. Bedford Branch.**—Brooklyn, N. Y.
- Y. M. C. A. West Side Branch.**—318 W. 57th St., New York City.

INSURANCE—AUTO

- Beales, H. W.**—William St., New York City.
- Boston Insurance Co.**
- Columbia Insurance Co. of N. Y.**—37 Wall St., New York City
- Eastland, James A.**—Bldg., Chicago, Ill.
- Fireman's Fund Insurance Co.**—San Francisco, Cal.
- James & Co., F.**—Chicago, Ill.
- Moore, Case, Lyman & Co.**—La Salle St., Chicago, Ill.

INSURANCE—AUTOMOBILE (Cont.)

Travelers Insurance Co.—Hartford, Conn.
Strauss, Sig. L.—159 La Salle St., Chicago, Ill.
Warner Co., The.—Niagara Falls, Canada.

IRON AND STEEL—ANGLE AND CHANNEL

American Steel Hoop Co.—Pittsburg, Pa.
Carnegie Steel Co.—Pittsburg, Pa.
Cramp & Sons Ship and Engine Building Co.—Philadelphia, Pa.
Galvanizing Co.—525 N. Front St., Philadelphia, Pa.
Lockhart Iron & Steel Co.—McKees Rocks, Pa.
Passaic Steel Co.—Paterson, N. J.
Pennsylvania Steel Co.—Steelton, Pa.
Republic Iron & Steel Co.—Stock Exchange Bldg., Chicago, Ill.
Smith Co., A. O.—Park & Clinton Sts., Milwaukee, Wis.

IRON AND STEEL—BAR

American Iron & Steel Mfg. Co.—Lebanon, Pa.
American Steel Hoop Co.—Pittsburg, Pa.
Bassett-Pressley Co.—Western Reserve Bldg., Cleveland, Ohio.
Beals, Geo. C.—29 Erie Co. Bank Bldg., Buffalo, N. Y.
Benjamin Iron & Steel Co.—1102 D. S. Morgan Bldg., Buffalo, N. Y.
Braeburn Steel Co.—Braeburn, Pa.
Cleveland Cap Screw Co.—2216 Clarkwood Road, Cleveland, Ohio.
Carnegie Steel Co.—Pittsburg, Pa.
Columbia Bridge Co.—Pittsburg, Pa.
Crucible Steel Co. of American.—Empire Bldg., Pittsburg, Pa.
Diamond State Steel Co.—Wilmington, Del.
Feine, August.—152 Terrace St., Buffalo, N. Y.
Galvanizing Co.—525 N. Front St., Philadelphia, Pa.
Garford Co., The.—Elyria, Ohio.
Johnston, U. S.—806 White Bldg., Buffalo, N. Y.
Jones & Laughlin Steel Co.—1019 White Bldg., Buffalo, N. Y.
Lockhart Iron & Steel Co.—McKees Rocks, Pa.
Logan Iron & Steel Co.—Burnham, Pa.
Long Arm System Co.—Lakeside Ave. & E. 38th St., Cleveland, Ohio.
Niagara Iron, Steel & Metal Co.—835 Ashland St., Niagara Falls, N. Y.
Phoenix Iron Co.—Phoenixville, Pa.
Republic Iron & Steel Co.—Stock Exchange Bldg., Chicago, Ill.

IRON AND STEEL—BAR (Continued)

Seneca Iron & Steel Co.—53 Erie Co. Bank Bldg., Buffalo, N. Y.
Smith, T. Guilford.—203 Ellicott Sq., Buffalo, N. Y.
Taylor Co., N. & G.—308 Chestnut St., Philadelphia, Pa.
Tonawanda Iron & Steel Co.—60 Erie Co. Bank Bldg., Buffalo, N. Y., and Ironton St., Tonawanda, N. Y.

IRON AND STEEL—SHEET

American Sheet Iron Co.—Phillipsburg, N. J.
American Steel & Wire Co.—The Rookery, Chicago, Ill.
Bassett-Pressley Co.—Western Reserve Bldg., Cleveland, Ohio.
Beals, Geo. C.—29 Erie Co. Bank Bldg., Buffalo, N. Y.
Benjamin Iron & Steel Co.—1102 D. S. Morgan Bldg., Buffalo, N. Y.
Canonsburg Iron & Steel Co.—Pittsburg, Pa.
Indestructible Steel Wheel Co.—1303 Michigan Ave., Chicago, Ill.
Johnston, W. S.—806 White Bldg., Buffalo, N. Y.
Jones & Laughlin Steel Co.—1019 White Bldg., Buffalo, N. Y.
La Belle Iron Works.—Steubenville, Ohio.
Maryland Sheet & Steel Co.—Cumberland, Md.
McCullough Iron Co.—Wilmington, Del.
Niagara Iron, Steel & Metal Co.—835 Ashland St., Niagara Falls, N. Y.
Seneca Iron & Steel Co.—53 Erie Co. Bank Bldg., Buffalo, N. Y.
Smith, T. Guilford.—203 Ellicott Sq., Buffalo, N. Y.
Taylor Co., N. & G.—308 Chestnut St., Philadelphia, Pa.
Tonawanda Iron & Steel Co.—60 Erie Co. Bank Bldg., Buffalo, N. Y., and Ironton St., Tonawanda, N. Y.
Waukesha Sheet Steel Co.—Waukesha, Wis.
Youngstown Iron Steel & Tube Co.—Youngstown, Ohio.

IRONS—BODY

Auto Top Co.—209 E. Columbia St., Fort Wayne, Ind.
Forg, Peter.—Park St., Somerville, Mass.
Frantz Auto Co.—Cherryville, Pa.
Gas Engine & Power Co.—Morris Heights, New York City.
Holmes & Co., J.—518 Broad St., Newark, N. J.
Kilburn, Edward.—Spring Valley, Minn.
Knapp Mfg. Co.—2529 Polk St., N. E., Minneapolis, Minn.
Milne, Frank.—Everett, Mass.

IRONS—BODY (Continued)

Offeldt & Sons, August.—123 Liberty St., New York City.
Portland Garage Co.—Portland, Me.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Rochester Machine Tool Works, Ltd.—Rochester, N. Y.
Schaffer Machine Mfg. Co., The.—211 N. Calvert St., Baltimore, Md.
Seabury, Co., Chas. L.—Morris Heights, New York City.
Shields Carriage Co., The.—Amesbury, Mass.
Steam Carriage Boiler Co.—119 W. 1st St., Oswego, N. Y.
Throop Perforating Co.—80 Terrace, Buffalo, N. Y.

IRONS—TIRE

Broc. Co.—1665-69 E. 40th St., 4021-23 Payne Ave., Cleveland, Ohio.
Cramp & Sons Ship & Engine Building Co.—Philadelphia, Pa.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Janney, Steinmetz & Co.—Fourth & Market Sts., Philadelphia, Pa.
Manhattan Screw and Stamping Works.—West End Ave. & 67th St., New York City.
Manhattan Storage Co.—1611 Broadway, New York City.
New Jersey Aluminum Co.—19th & Springfield Aves., Newark, N. J.
Ross, H. S.—5607 S. Halsted St., Chicago, Ill.
Teel Mfg. Co.—Medford, Mass.
Trenton Malleable Iron Co.—New York Ave., Trenton, N. J.
Utility Co., The.—233 Greenwich St., New York City.

JACKS

Adams, H.—Lunbridge Wells, England.
Anhaltische Fahrengwerkstaette Krause.—Dessau, Germany.
Autobed Co., The.—Boston, Mass.
Automobile Equipment Co.—264 Jefferson Ave., Detroit, Mich.
Barbou Fils.—52 rue Montmartre, Paris, France.
Barth Mfg. Co.—Milwaukee, Wis.
Benton & Stone.—Bracebridge St., Birmingham, England.
Berger Co., Joseph.—319-20 Hart St., Dayton, Ohio.
Bicycle Step Ladder Co., The.—63 Randolph St., Chicago, Ill.
Britannia Foundry Co.—Cox St., Coventry, England.
Buckeye Jack Mfg. Co.—Louisville, Ohio.
Buda Foundry & Mfg. Co.—Chicago, Ill.
Capital Auto Co.—Indianapolis, Ind.

JACKS (Continued)

Cook's Standard Tool Co.—Kalamazoo, Mich.
Covert Mfg. Co.—Troy, N. Y.
Deville, E.—Grand-Croix, Loire, France.
Duff Mfg. Co.—Pittsburg, Pa.
Durkopp und Co.—Bielefeld, Germany.
Empire Mfg. Co.—Helena St., Birmingham, England.
Empire State Tire Co.—Buffalo, N. Y.
Eureka Mower Co.—Utica, N. Y.
Excelsior Mfg. Co.—233-37 Randolph St., Chicago, Ill.
Ferodowill Mfg. Co.—St. Paul, Minn.
Froussart, G.—Charleville, Ardennes, France.
Garlick Auto Prop. Co.—Madison Ave. & Broadway, Paterson, N. J.
Girerd, M.—Rouillac, Charente, France.
Helm, August.—10 Lutzoustrasse, Frankfort, Germany.
Jersey Brake Co.—93 Green St., Newark, N. J.
Joly, A.—123 Bvd. Pereire, Paris, France.
Lake & Elliot.—Albion Works, Braintree, England.
Lane Motor Vehicle Co.—Poughkeepsie, N. Y.
Leather & Brass Mfg. Co.—24-26 E. Genesee St., Auburn, N. Y.
Ledin, F.—30 quai de la Charite, Lyon, France.
Leng's Son & Co., John S.—33 Murray St., New York City.
Lucas, Jos. Ltd.—Birmingham, England.
Maxwell & Co., L. R.—Cedar Rapids, Iowa.
Michelin et Cie.—105 bvd. Peréire, Paris, France.
Oliver Mfg. Co.—213 S. Desplaines St., Chicago, Ill.
Osborne Pole & Shaft Co.—Anderson, Ind.
Patterson, Gottfried & Hunter, Ltd.—146-150 Centre St., New York City.
Peddighaus, Carl Daniel.—Altenvorde, Germany.
Pringent, Jules Marie.—Tours, France.
Rockermeyer, V.—Würzburg, Germany.
Roth Jack & Tool Co.—68 William St., New York City.
Schwarze Cia.—Genoa, Italy.
Shaw Engineering & Mfg. Co.—216 High St., Newark, N. Y.
Shawver Co.—Springfield, Ohio.
Smith & Hemmingsway.—296 F New York City.
Société Industrielle des Téléph.—rue du 4-Septembre, Paris, France.
Standard Tool Co.—432 Kalamazoo, Mich.
Statter & Co.—Newhall ham, England.
Tourneur, C. et E.—20 rue Re Paris, France.

JACKS (Continued)

Trenton Malleable Iron Co., The.—New York Ave., Trenton, N. J.
U. S. Jack Co.—128-30 W. Lake St., Chicago, Ill.
Whipple, R. W.—169 State St., Binghamton, N. Y.

JOINTS—UNIVERSAL

Ashley Machine Works.—714 University Ave., Rochester, N. Y.
Bausch Machine Tool Co.—Wason Ave., Springfield, Mass.
Blood Bros. Machine Co.—Kalamazoo, Mich.
Cambria Forge Co.—Cleveland, Ohio, & Johnstown, Pa.
Coates-Clipper Mfg. Co.—Worcester, Mass.
Columbus Screw & Machine Co.—Columbus, Ohio.
Gray & Prior Machine Co.—Hartford, Conn.
Hartford Auto Parts Co.—Howard Bldg., Hartford, Conn.
Hatcher Auto Parts Co.—Cleveland, O.
Kinsler-Bennett Co.—62 Market St., Hartford, Conn.
Moran Flexible Joint Co.—149 3rd St., Louisville, Ky.
Muncie Auto Parts Co.—Elliott St., L. E. W. Yards, Muncie, Ind.
Mutual Machine Co.—25 Wells St., Hartford, Conn.
Precision Appliance Co.—832 Austin Ave., Chicago, Ill.
Ross Gear & Tool Co.—849 Main St., Lafayette, Ind.
Spicer Universal Joint Mfg. Co.—Plainfield, N. J.
Vanderbeek Tool Works.—Hartford, Conn.

KETTLES—RETRREADING

Auto Tire Vulcanizing Co.—Factory, 689 Lawrence St. Office, Plain St., Lowell, Mass.
Wishart Machine Works, John.—63-65 S. Canal St., Chicago, Ill.

KITS—TIRE REPAIR

Auto Goods Co.—60 State St., Boston, Mass.
Channon & Co., H.—Market & Randolph Sts., Chicago, Ill.
Automobile Tire Co.—Trenton, N. J.
Rich Co., B. F.—Akron, Ohio.
National Cement & Rubber Mfg. Co.—159 Monroe St., Toledo, Ohio.
Orlando W.—180 Frelinghuysen park, N. J.

QUER—ALUMINUM

st, Jr., James S.—Walnut St., Lynbrook, N. Y.

LAMP LIGHTING DEVICES

Pinkus, Frederick B.—103 Franklin St., New York City.
Rolfe-Fox Co.—402 N. Livingston Bldg., Rochester, N. Y.
Royal Battery Co.—108-110 Duane St., New York City.

LAMPS—ACETYLENE

Abel Mfg. Co.—1112 Great Northern Bldg., Chicago, Ill.
Ateliers H. Leclerc.—108 rue St. Leonard, Liege, Belgium.
Autolyte Mfg. Co.—10-12 Thomas St., New York City.
Automobile Supply Mfg. Co.—139-147 Emerson Place, Brooklyn, N. Y.
Badger Brass Mfg. Co.—Kenosha, Wis.
Besnard, Maris et Antoine.—60 bvd. Beaumarchais, Paris, France.
Billy, C.—1 rue Jean Stas, Brussels, Belgium.
Bittner, M. & Co.—Thaborstrasse 108, Vienna, Austria.
Blériot Société Anonyme.—14 rue Duret, Paris, France.
Boas et Cie., Rodriques.—67 bvd. de Charonne, Paris, France.
Bondin et Cie.—23 place du Chatelain, Brussels, Belgium.
Bouillet, Léon.—St. Cheron, Seine-et-Oise, France.
Carello, F. e P.—fratelli 21, via Berthollet, Turin, Italy.
Desponta.—150 rue Victor Hugo, Levallois, Seine, France.
Denich, A.—144 rue St. Maur, Paris, France.
Diem, E. et R. Poey.—62 bis, ave. Parmentier, Paris, France.
Du Bois Searchlight Co.—220 Broadway, New York City.
Ducellier, G.—25 Passage Dubail, Paris, France.
Eco Mfg. Co.—53 State St., Boston, Mass.
Edmunds & Jones.—315 Riopelle St., Detroit, Mich.
Forest et Cie., G.—32 bvd. Henri Fourth, Paris, France.
Gauthier et Trentelivres.—30 rue de Malines, Brussels, Belgium.
Gray & Davis.—Amesbury, Mass.
Gray & Sons, Peter.—90 Union St., Boston, Mass.
Ham Mfg. Co., C. T.—Rochester, N. Y.
Hubeaux, F.—12 rue Montera, Paris, France.
Jacob, Michel.—8 bvd. Voltaire, Paris, France.
Kaffel, Ch.—212 bis, bvd. Pereire, Paris, France.
Lemoine, J.—39 bvd. Bandoin, Brussels, Belgium.
London Scottish Rubber Co.—162 Clerkewell Road, London, E., England.
Lucas, Jos., Ltd.—Great King St., Birmingham, England.

LAMPS—ACETYLENE (Continued)

- Manhattan Screw & Stamping Works.**—West End Ave. & 67th St., New York City.
Miller Mfg. Co., The.—813 Central Ave., Peekskill, N. Y.
Monin, Felix.—32 rue Croix, Jordan, Lyon, France.
New York Auto Lamp Co.—585 Washington St., New York City.
New York Coach & Auto Lamp Co.—794-98 Tenth Ave., New York City.
Northwestern Storage Battery Co.—448 Milwaukee St., Milwaukee, Wis.
Officine Canavesio, Carello.—15 corso Brescia, Turin, Italy.
Pittevil, A.—rue de la Chancellerie, Brussels, Belgium.
Polkey.—Finsbury Pavement House, London, E., England.
Pyle Mfg. Co.—2211 Park Ave., Indianapolis, Ind.
Rushmore Dynamo Works.—Plainfield, N. J.
Rejna, Zanardine e Ca.—39 Bastioni Magenta, Milan, Italy.
Rieman, Herman.—Chemnitz, Gablenz, Germany.
Roose, J.—46 rue de Bavière, Brussels, Belgium.
Rose Manufacturing Co.—910 Arch St., Philadelphia, Pa.
Rotax Motor & Cycle Co., Ltd.—60 Curtain Road, London, E., England.
Salsbury & Son, Ltd.—124 Longacre, London, England.
Scharbach, Otto.—Nürnberg, Germany.
Scoville & Peck.—15 Wooster St., New Haven, Conn.
Sehen, Ch.—bvd. d'Alsace-Lorraine, Le Perreux, Seine, France.
Société Anonyme L'Acétylène.—61 bvd. du Hainant, Brussels, Belgium.
Standard Lamp Mfg. Co.—43 S. Canal St., Chicago, Ill., & Charlotte, Mich.
Twentieth Century Mfg. Co.—19 Warren St., New York City.
Vallée, V.—23 Passage Menilmontant, Paris, France.
Weichman, Veuve, Franz.—Dresdenerstrasse 116, Vienna, Austria.
Westfälische Metallindustrie Actiengesellschaft.—Lippstadt, Germany.
White Mfg. Co.—Cannon St., Bridgeport, Conn.
Willocq, Bottin.—33 Square Gutenberg, Brussels, Belgium.

LAMPS—ELECTRIC

- Ateliers, H. Leclerc.**—108 rue St. Leonard, Liege, Belgium.
Badger Brass Mfg. Co.—Kenosha, Wis.
Compound, Allumage Électrique.—Levallois, Seine, France.
Frank, Albert.—Beierfeld, Germany.
Gray & Davis.—Amesbury, Mass.

LAMPS—ELECTRIC (Continued)

- Henry, Lenud et Cie.**—51 rue de Turenne, Paris, France.
Hirsch, E.—26 rue Crussol, Paris, France.
Hydra Société Électrique.—60 bvd. de Clichy, Paris, France.
James, M.—62 rue St. Antoine, Paris, France.
Northwestern Storage Battery Co.—448 Milwaukee St., Milwaukee, Wis.
Ohio Electric Works.—6304 Ellen Ave., N. W., Cleveland, Ohio.
Oldfield, J. and R.—Warwick St., Birmingham, England.
Peto and Radford, Ltd.—Ashted, Surrey, England.
Pohl und Helbig.—Friedrichstrasse 225, Berlin, Germany.
Prested Miner's Gas Indicating Electric Lamp Co., Ltd.—Elthorne Road, Holloway, London, N., England.
Société Levitas.—128 rue du Bois, Levallois, Seine, France.
Storage Battery Supply Co.—239 E. 27th St., New York City.
Vesta Accumulator Co.—1334 Michigan Ave., Chicago, Ill.
Ward and Goldstone.—Salford, Manchester, England.

LAMPS—OIL

- American Auto Brass Co.**—181 W. Maple St., Columbus, Ohio.
American Lamp Co.—255 Jefferson Ave., Detroit, Mich.
American Lamp Works.—253 W. 47th St., New York City.
Ateliers, H. Leclerc.—108 rue St. Leonard, Liège, Belgium.
Atwood Mfg. Co.—Amesbury, Mass.
Badger Brass Mfg. Co.—Kenosha, Wis.
Billy, C.—1 rue Jean-Stas., Brussels, Belgium.
Boas, Rodrigues et Cie.—76 bvd. de Charonne, Paris, France.
Bucket, Paul.—13 rue du Général Dufour, Geneva, Switzerland.
Carello, F. e P.—fratelli 21, via Berthollet, Turin, Italy.
Carlisle & Finch Co.—223 E. Clinton Ave., Cincinnati, Ohio.
Chicago Auto Lamp Works.—71 W. Jackson Blvd., Chicago.
Corcoran Lamp Co.—Cincinnati, Ohio.
Cowles & Co., C.—N.
Dalsace, G.—23 r . . . m France.
Dayton Mfg. Co.—ton, Ohio.
Denich, A.—144 r France.
Diem, E. et R. Pory-mentier, Paris, Fran

LAMPS—OIL (Continued)

- Diets Co., R. E.**—60 Laight St., New York City.
Ducellier, G.—25 Passage Dubail, Paris, France.
English & Mersick Co.—New Haven, Conn.
Gauthier et Trentelivres.—30 rue de Malines, Brussels, Belgium.
Gray & Davis.—Amesbury, Mass.
Gray & O'Sna, Peter.—90 Union St., Boston, Mass.
Ham Mfg. Co., C. T.—137 Oak St., Rochester, N. Y.
Holcomb, H. C.—105 Goffe St., New Haven, Conn.
Hubeaux, F.—12 rue Montera, Paris, France.
Jacob, Michel.—8 bvd. Voltaire, Paris XI, France.
Jungmann, Felix.—Friedrichsgracht 42, Berlin, Germany.
Lemoine, J.—39 bvd. Baudoin, Brussels, Belgium.
John S. Leng's Son & Co.—33 Murray St., New York City.
Lockwood Co.—34 Mechanic St., Newark, N. J.
Manhattan Brass Co.—332 E. 28th St., New York City.
Manhattan Lamp Works.—530 W. 28th St., New York City.
Mégevet et Cie., C. J.—Geneva, Switzerland.
Neelemans, A. et Tadiou.—25 rue d'Edimbourg, Brussels, Belgium.
Riemann, Herman.—Chemnitz Gablenz, Germany.
Salvador, Blas.—10 calle Pelayo, Barcelona, Spain.
Saxon Lamp Co.—526 to 532 W. 28th St., New York City.
Scharlach, Otto.—Nürnberg, Germany.
Seheu, Ch.—1 bvd. d'Alsace-Lorraine, LePerreux, Seine, France.
Willocq-Bettin.—33 Square Gutenberg, Brussels, Belgium.

**LAWN MOWERS, POWER DRIVEN,
see IMPLEMENTS, AGRICULTURAL**

LEAD—PIG

- Columbia Smelting & Refining Co.**—365-67 West St., New York City.
Taylor Co., N. & G.—308 Chestnut St., Philadelphia, Pa.
United States Indestructible Gasket Co.—16 South William St., New York City.

LEATHER

- American Oak Leather Co.**—176 South St., Boston, Mass.
American Oak Leather Co.—Kenner St. & Dalton Ave., Cincinnati, Ohio.
Ashtabula Hide & Leather Co.—Ashtabula, Ohio.

LEATHER (Continued)

- Caffrey Leather Co., M.**—Frelinghuysen Ave. and Meeker St., Newark, N. J.
Carr, F. S.—74 Pearl St., Boston, Mass.
Cleveland Tanning Co.—Jennings and Dennison Ave., S. W., Cleveland, Ohio.
Halsey & Smith, J. H.—Shipman and Springfield Aves., Newark, N. J.
Howell & Co., T. P.—Newark, N. J.
Klauder, Chas. L.—B St. and Allegheny Ave., Philadelphia, Pa.
Lackawanna Leather Co.—Hacketts-town, N. J.
McCormick & Sons, E. H.—Ave. C and Vanderpool St., Newark, N. J.
Patent Leather Co. of America, The.—Newark, N. J.
Radel Leather Mfg. Co.—Hamburg Place Road, Newark, N. J.
Raser Tanning Co.—Astabula, Ohio.
Reilly & Son, P.—Passaic Ave., Newark, N. J.
Rex Imperial Leather Co.—16 Chappel St., Newark, N. J.
Roehm & Davison, Ltd.—91-95 West Woodbridge St., Detroit, Mich.
Standard Leather Co.—296 Spring Garden Ave., Allegheny, Pa.
Terwilliger-Stone Leather Co.—210 New Jersey Railroad Ave., Newark, N. J.
Ward & Co., E. S.—Newark, N. J.
Whitcher & Co., Frank W.—14 Albany St., Boston, Mass.
Wing & Co., Charles.—Amesbury, Mass.
Wolverine Leather Goods Co.—59 E. Fort St., Detroit, Mich.

LEATHER—ARTIFICIAL

- Boston Artificial Leather Co.**—12 E. 18th St., New York City.
Carr, F. S.—74 Pearl St., Boston, Mass.
Mutty Co., L. J.—28 Summer St., Boston, Mass.
Pantasote Co., The.—11 Broadway, New York City.
Whitcher & Co., Frank W.—14 Albany St., Boston, Mass.

LEVERS

- Aetna Brass Mfg. Co.**—4800 Hamilton Ave., Cleveland, Ohio.
American & British Mfg. Co.—Bridgeport, Conn.
Cramp & Sons Ship and Engine Building Co.—Philadelphia, Pa.
Garford Co., The.—Elyria, Ohio.
Locke Regulator Co.—76 North St., Salem, Mass.
Long Arm System Co.—Lakeside Ave. and E. 38th St., Cleveland, O.
Muncie Auto Parts Co.—Elliott St. & L. E. W. Yards, Muncie, Ind.
Smith Co., A. O.—Park and Clinton Sts., Milwaukee, Wis.
Wilkinson, J. Franklin—Inventor, Gloucester, Mass.

LIFTERS—VALVE

- Automobile Specialty Co.**—509 Willoughby Bldg., Chicago, Ill.
Auto Specialty Co.—6 E. Madison St., Chicago, Ill.
Noonan Tool & Machine Works.—Rome, N. Y.
Polson, W. F.—22 W. Utica St., Buffalo, N. Y.
White, Sam B.—91 Sabin St., Providence, R. I.

LOCKERS

- Art Metal Construction Co.**—Jamestown, N. Y.
Darby & Sons Co., Edward.—233 Arch St., Philadelphia, Pa.
Merritt & Co.—1022-30 Ridge Ave., Philadelphia, Pa.
Ohnstrand & Son, H. R.—413 S. Clinton St., Syracuse, N. Y.

LUBRICATORS

- Adapt Machinery Co.**—1624-34 Wabash Ave., Chicago, Ill.
American Injector Co.—Detroit, Mich.
American Lubricator Co.—Detroit, Mich.
Bailly, C.—168 bvd. de la Villette, Paris, France.
Ben Hur Motor Co.—120 Randolph St., Chicago, Ill.
Blanke und Rast.—Leipzig, Plagwitz, Germany.
Briet et Cie., M.—7 rue Magenta, Puteaux, France.
Cailleau et Cie.—20 rue des Walloons, Liege, Belgium.
Charter & Co.—303 Dearborn St., Chicago, Ill.
Couteau, H.—95 rue d'Angouleme, Paris, France.
de Boisse, J.—85 rue Traverssière, Billancourt, Seine, France.
Detroit Lubricator Co.—Trumbull and Lincoln Aves. and G. T. Ry., Detroit, Mich.
Dodge Lubricator Co.—8 Waltham St., Boston, Mass.
Draper Co., Walter H.—120 S. Railroad Ave., Mt. Vernon, N. Y.
Dubrulle, Louis.—28 rue Villeneuve, Clichy-sur Seine, France.
Elevator Supply & Repair Co.—76 W. Monroe St., Chicago, Ill.
Frasze & Co., Peter A.—92-4 Fulton St., New York City.
Gauthier et Trentelivres.—30 rue de Malines, Brussels, Belgium.
Greene, Tweed & Co.—17 Murray St., New York City.
Guyénet, J.—rue de Printemps, Paris, France.
Hamelle, H.—21 quai Valmy, Paris, France.

LUBRICATORS (Continued)

- Hancock Mfg. Co.**—770 E. Henry St., Charlotte, Mich.
Hatcher Auto Parts Co.—2108 Superior Ave., Cleveland, Ohio.
Hill, E. H., Beta Works.—56 Bromfield St., Sheffield, England.
Hussenet et Raynaud.—39 rue La Boétie, Paris, France.
Kinsey Mfg. Co.—Dayton, Ohio.
Lavigne Mfg. Co.—Detroit, Mich.
Lee Injector Co.—Port Huron, Mich.
Lafevbre fils, Albert.—5 rue Delteral, Pré St. Gervais, Seine, France.
Liotard Frères.—22 rue de Lorraine, Paris, France.
Lonegran & Co., J. E.—211-215 Race St., Philadelphia, Pa.
Longhurst, Jas. S., Jr.—Walnut St., Lynbrook, L. I., N. Y.
Lunkenheimer Co., The.—Cincinnati, Ohio.
Manzel Bros. Company.—317-319 Babcock St., Buffalo, N. Y.
McCanna Mfg. Co.—56 N. Jefferson St., Chicago, Ill.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Michigan Lubricator Co.—661-67 Beau-pien St., Detroit, Mich.
Mosher Sales Co.—32 St. Paul St., Rochester, N. Y.
Muller et Cie., Roger.—108 ave. Philippe-Auguste, Paris, France.
National Sewing Machine Co.—Belvidere Ill.
Neely, Edward.—244 Wells St., Chicago, Ill.
Noera Mfg. Co.—Waterbury, Conn.
Officina San Giorgio.—via Valperga Caluso, Turin, Italy.
Oger et Guérin.—36 rue Godefroy-Cavaignac, Paris, France.
Ohio Brass Co.—Mansfield, Ohio.
Palous und Beuse.—Zimmerstrasse 30, Berlin, Germany.
Pedersen Mfg. Co.—400-412 E. 37th St., New York City.
Peeters, Cl.—85 rue Heyvaert, Molenbeek-Brussels, Belgium.
Penberthy Injector Co.—Detroit, Mich.
Piccoli Fratelli e Ca.—via Capellari, Milan, Italy.
Powell Co., William, The.—2525-2531 Spring Grove Ave., Cincinnati, Ohio.
Precision Appliance Co.—Ave., Chicago, Ill.
Redington & Co., F. B.—gamon St., Chicago,
Roller et Cie.—67 ave. France.
Ross, Courtney and brooke Road, Upper F " don, N., England.
Rotherham and Sons.—(land.

LUBRICATORS (Continued)

Schaeffer und Oehlmann.—Chaussee-strasse 46, Berlin, N., Germany.
Schoelkopf Mfg. Co.—Madison, Wis.
Sclaverand, Morin Successeur.—48 rue de l'Aqueduc, Paris, France.
Sherwood Mfg. Co.—Elmwood Ave. and Belt Line, Buffalo, N. Y.
Standard Automobile Lubricator Co.—361-63 Ellicott St., Buffalo, N. Y.
Standard Gauge Mfg. Co.—Industrial Bldg., Syracuse, N. Y.
Sturtevant Mill Co.—Harrison Sq., Boston, Mass.
Thevenin Freres, Seguin et Cie.—116 bvd. Richard Lenoir, Paris, France.
Turner Brass Works, The.—72 Michigan St., Chicago, Ill.
Wanner et Cie.—67 ave. de la Republique, Paris, France.
Weidner, Richard.—Leipzig, Germany.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, Ohio.
Winkley Co., The.—226 Abbot St., Detroit, Mich.

MACHINES, BUFFING, see BUFFERS

MACHINES—MILLING

Becker-Brainard Milling Machine Co.—110 Business St., Hyde Park, Mass.
Cincinnati Milling Machine Co.—Cincinnati, Ohio.
Gisholt Machine Co.—1300 Washington Ave., Madison, Wis.
Whitney Mfg. Co.—Hartford, Conn.

MACHINES, PORTABLE DRILLING, see DRILLS, MACHINE, PORTABLE

MACHINES—TUFTING AND UP-HOLSTERING

Novelty Tufting Machine Co.—1200 Michigan Ave., Chicago, Ill.

MACHINE WORK—TO ORDER

American Die & Tool Co.—Reading, Pa.
American Machine & Mfg. Co., The.—Cleveland, Ohio.
Ashley Machine Works.—714 University Ave., Rochester, N. Y.
Beverly Mfg. Co.—Beverly, Mass.
Blake & Johnson.—Waterbury, Conn.
— & Whitman Co.—94-104 W. 7th Bayonne, N. J.
Machine & Foundry Co.—115 1st Bldg. Cleveland, Ohio.
— & Co., Peter A.—92-94 Fulton St., New York.
m & Son, Wm.—45 Rose St., New York City.
d & Son, John A.—25 Park Place, New York City.
ord Machine Screw Co.—476 Capitol Ave., Hartford, Conn.

MACHINE WORK—TO ORDER (Continued)

Hill Co., Geo. Q.—326 A st., Boston, Mass.
Holt & Co., W. H.—95 Pine St., Providence, R. I.
Homer Brass Works.—231 Race St., Philadelphia, Pa.
Hopson & Chapin Mfg. Co.—New London, Conn.
Jones, Frank S.—629 Filbert St., Philadelphia, Pa.
Jones Motor Co., Geo. H.—6th St., Camden, N. J.
Konigalaw Mfg. Co., Otto.—2279 Clarkwood Rd., Cleveland, O.
Lee Mfg. Co., The.—Connors St., Port Huron, Mich.
Lippincott Steam Specialty & Supply Co.—Newark, N. J.
Machinery Forging Co.—Hamilton & Marquette Sts., Cleveland, Ohio.
Manufacturers Foundry Co.—Waterbury, Conn.
Massnick Mfg. Co.—1567 River St., Detroit, Mich.
McCutchen Gear & Mfg. Co.—205 W. South St., Indianapolis, Ind.
Michigan Automobile Co., Ltd.—Kalamazoo, Mich.
Muncie Auto Parts Co.—Ellicott St. and L. E. W. Yards, Muncie, Ind.
National Cycle Mfg. Co.—Bay City, Mich.
Pacific Iron Works, Inc.—Bridgeport, Conn.
Patterson, Gottfried & Hunter, Ltd.—146-50 Center St., New York.
Pattinson Mfg. Co.—48 Stanhope St., Boston, Mass.
Pittsburg Brass Mfg. Co.—3153 Penn Ave., Pittsburg, Pa.
Rhode Island Machine Co., The.—Providence, R. I.
Standard Metalwork Co.—Thompsonville, Conn.
Taft, Pierce Co.—Woonsocket, R. I.
Throop Perforating Co.—80 Terrace, Buffalo, N. Y.
Widmer Machine Works.—43-47 Fort St., E., Detroit, Mich.

MACHINERY—SPECIAL AUTOMOBILE

Adams Co., The.—Dubuque, Iowa.
American & British Mfg. Co.—Gov't Contractors, Crescent Ave., Bridgeport, Conn.
Baker Bros.—Westlake and Post Sts. and M. C. R. R., Toledo, Ohio.
Barnes Co., W. F. & John.—Rockford, Ill.
Beaman & Smith Co., The.—Providence, R. I.
Becker-Brainard-Milling Machine Co.—110 Business St., Hyde Park, Mass.

MACHINERY—SPECIAL AUTOMOBILE (Continued)

Billings & Spencer Co.—Hartford, Conn.
Brown Machine Works.—Battle Creek, Mich.
Brown & Sharp Mfg. Co.—Providence, R. I.
Bullard Machine Co.—Bridgeport, Conn.
Chicago Pneumatic Tool Co.—1010 Fisher Bldg., Chicago, Ill.
Cincinnati Electric Tool Co., The.—650-52 Evans St., Cincinnati, O.
Cincinnati Milling Machine Co.—Cincinnati, Ohio.
Davis-Bournoville Acetylene Development Co.—Room 1511, 90 West St., New York City.
Defiance Machine Works.—Defiance, Ohio.
Eaton, Cole & Burnham Co., The.—Bridgeport, Conn.
Everhardt Bros. Machine Co.—66-68 Union St., Newark, N. J.
Field Co., Chas. H.—230 Chestnut St., Providence, R. I.
Fitchburg Machine Works.—Fitchburg, Mass.
Fortin Tool Co., B. P.—227 N. Main St., Woonsocket, R. I.
Franklin Portable Crane & Hoist Co.—Franklin, Pa.
Garvin Machine Co.—Spring and Varick Sts., New York City.
Geometric Tool Co.—Blake and Valley Sts., New Haven, Conn.
Gisholt Machine Co.—1300 Washington Ave., Madison, Wis.
Gould & Eberhardt.—99 N. J. R. R. Ave., Newark, N. J.
Grant Lees Machine Co., The.—Quincy Ave. and E. 69th St., Cleveland, O.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Heald Machine Co.—Worcester, Mass.
Hill, Clark & Co.—156 Oliver St., Boston, Mass.
Hisey Wolf Machine Co.—Cincinnati, Ohio.
Kempsmith Mfg. Co.—Linus St. and Woodward Ave., Milwaukee, Wis.
Lamb Electric Co.—31 Canal St., Grand Rapids, Mich.
Landis Tool Co.—Waynesboro, Pa.
La Pointe Machine Tool Co.—Boston, Mass.
Leland & Co., S. W. H.—Southbridge St. and Hope Ave., Worcester, Mass.
Massnick Mfg. Co.—1567 River St., Detroit, Mich.
National-Acme Mfg. Co., The.—Stanton Ave., S. E., and E. 75th St., Cleveland, Ohio.
Niagara Falls Brass Works, Inc.—146 Virginia St., Buffalo, N. Y.
Niles-Bement-Pond Co.—111 Broadway, New York City.
Norton Grinding Co.—Worcester, Mass.

MACHINERY—SPECIAL AUTOMOBILE (Continued)

Potter & Johnston Machine Co.—Pawtucket, R. I.
Pratt & Whitney Co., The.—Hartford, Conn.
Prentiss Tool & Supply Co.—115 Liberty St., New York City.
Puritan Machine Co.—12-16 Gratiot Ave., Detroit, Mich.
Francis Reed Co.—43 Hammond St., Worcester, Mass.
Smith Co., Wm. J.—New Haven, Conn.
Springfield Machine Tool Co.—Southern Ave., Springfield, Ohio.
Stephoe Shaper Co., John, The.—2961 Colerain Ave., Cincinnati, Ohio.
Stow Flexible Shaft Co.—Philadelphia, Pa.
Tindel-Morris Co.—Eddystone, Pa.
Von Wyck Machine Tool Co.—Cincinnati, O.
Wilmarth & Morman Co.—585 Canal St., Grand Rapids, Mich.

MAGNETOS—HIGH TENSION

Apparatebau-Anstalt Fischer.—Frankfurt-Oberrad, Germany.
Ateliers, H. Leclerc, Société Anonyme.—33 quai St., Leonard, Liege, Belgium.
Atwater-Kent Mfg. Works.—50 N. 6th St., Philadelphia, Pa.
Autoteil Gesellschaft.—Franzosischerstrasse 8, Berlin, Germany.
Boas, Hans.—Krautstrasse 52, Berlin, Germany.
Bosch, Robert.—1945 Broadway, New York City.
Bosch, Robert.—Stuttgart, Germany.
Broc-Barber Auto Ignition Co.—143 W. 54th St., New York City.
Carlisle & Finch Co.—223 E. Clinton Ave., Cincinnati, Ohio.
Champion Co., Albert.—541 Tremont St., Boston, Mass.
Climax Igniter Co.—Amesbury, Mass.
Compagnie des Magnets Simms-Bosch, Ltd.—22 rue Violet, Paris, France.
Constantine Mfg. Co.—Constantine, Mich.
Eisemann, Ernst und Co.—Stuttgart, Germany.
Elbridge Electric Co.—Elbridge, N. Y.
Engineering Specialty Co., Inc.—143 Liberty St., New York City.
Fawn River Mfg. Co.—Mich.
Fisher Co., A.—11th E.
Gianoli, N.—20 France.
Gibaud.—309 Fa France.
Giffard, V.—54 rue France.
Glaenzer & Co.—26-28 New York City.

MAGNETOS—HIGH TENSION
(Continued)

Goodson Electric Ignition Co.—Providence, R. I.
Hennegrave & Agnus.—30 rue Pereire, Levallois-Perret, France.
Henricks Novelty Co.—130 S. Capital Ave., Indianapolis, Ind.
Hercules Electric & Mfg. Co.—709 Langsdale Ave., Indianapolis, Ind.
Herz & Co.—203-05 Lafayette St., New York City.
Holley Bros. Co.—661-75 Beaubien St., Detroit, Mich.
Holtzer-Cabot Electric Co.—Brookline, Mass.
Kendrick & Davis.—Lebanon, N. H.
Knoblock-Heideman Mfg. Co.—South Bend, Ind.
K. W. Ignition Co., The.—Cleveland, O.
Lacoste et Cie.—28 bvd. Strasbourg, Paris, France.
Lavalette & Co.—112 E. 42d St., New York City.
Lavalette et Cie.—111 bis bvd. Menilmontant, Paris, France.
Magneta Actiengesellschaft.—Zurich, Switzerland.
Motsinger Device Mfg. Co.—36 Main St., Pendleton, Ind.
Nieuport.—9 rue de Seine, Suresnes, France.
Nilmelior, Société d'Electricite.—47 rue Lacordaire, Paris, France.
Ohio Electric Works.—6304 Ellen Ave., N. W., Cleveland, Ohio.
O. K. Electric Co.—106-10 Locust St., St. Louis, Mo.
Perfection Magneto Co.—Anderson, Ind.
Pittsfield Spark Coil Co.—Dalton, Mass.
Poly-Phase Ignition System Co.—52 Broadway, New York City.
Remy Electric Co.—Anderson, Ind.
Rubay, Leon.—136 W. 38th St., New York City.
Ruprecht Electrical Co.—769 Cedar Ave., Cleveland, Ohio.
Schmid-Roost, J.—Oerlikon, Switzerland.
Simms Mfg. Co., Ltd., Welbeck Works.—Kimberley Road, Willesden Lane, Kilburn, London, W., England.
Société Anonyme La Mécanique de Precision.—Charleroi, Belgium.
Spicer Universal Joint Mfg. Co.—3rd St. and Madison Ave., Plainfield, N. J.
Splitdorf, Chas. F.—261-65 Walton Ave., New York City.
Tritt Electric Co.—301 Division St., Union City, Ind.
Unterberg und Helme.—Karlsruhe, Germany.
Willyoung Appliance Co.—Ludlow Station, Yonkers, N. Y.

MAGNETOS—LOW TENSION
Ateliers, H. Leclerc, Société Anonyme.—33 quai St. Leonard, Liege, Belgium.

MAGNETOS—LOW TENSION
(Continued)

Atwater-Kent Mfg. Works.—50 N. 6th St., Philadelphia, Pa.
Bosch, Robert.—1945 Broadway, New York City.
Bréguet.—22 ave. de la Grande Armée, Paris, France.
Broc-Barbier Auto Ignition Co.—143 W. 54th St., New York City.
Carlisle & Finch Co.—223 E. Clinton Ave., Cincinnati, Ohio.
Champion Co., Albert.—541 Tremont St., Boston, Mass.
Climax Igniter Co.—Amesbury, Mass.
Compagnie des Magnetos Simms-Bosch, Ltd.—22 rue Violet, Paris, France.
Constantine Mfg. Co.—Constantine, Mich.
Dayton Electrical Mfg. Co.—87 St. Clair St., Dayton, Ohio.
Eisemann und Co., Ernst.—Stuttgart, Germany.
Elektrotechnischefabrik Lutz.—Hornergasse 12, Zurich, Switzerland.
Engineering Specialty Co., Inc.—143 Liberty St., New York City.
Gianoli, L.—26 bvd. Magenta, Paris, France.
Gibaud.—309 Faubourg St. Antoine, Paris, France.
Hennegrave & Agnus.—30 rue Pereire, Levallois-Perret, France.
Henricks Novelty Co.—130 S. Capital Ave., Indianapolis, Ind.
Herz & Co.—203-05 Lafayette St., New York City.
Holley Bros. Co.—661-73 Beaubien St., Detroit, Mich.
Holtzer-Cabot Electric Co.—Brookline, Mass.
Invicta Société.—5 rue Deves, Neuilly-Paris, France.
Kendrick & Davis.—Lebanon, N. H.
Kiel, Wilhelm.—30 rue Beaubourg, Paris, France.
Knoblock-Heideman Mfg. Co.—South Bend, Ind.
Lacoste et Cie.—28 bvd. Strasbourg, Paris, France.
Lavalette & Co.—112 E. 42nd St., New York City.
Lavalette et Cie.—111 bis bvd. Menilmontant, Paris, France.
Nilmelior, Société d'Electricite.—47 rue Lacordaire, Paris, France.
Perfection Magneto Co.—Anderson, Ind.
Pittsfield Spark Coil Co.—Dalton, Mass.
Poly-Phase Ignition System Co.—52 Broadway, New York City.
Remy Electric Co.—Anderson, Ind.
Rubay, Leon.—136 W. 38th St., New York City. (Importer.)
Simms Mfg. Co., Ltd., Welbeck Works.—Kimberley Road, Willesden Lane, Kilburn, London, W., England.

MAGNETOS—LOW TENSION
(Continued)

- Société Anonyme d'Electricite et d'Automobiles Mors.**—48 rue du Théâtre, Paris, France.
Splitdorf, Chas. F.—261-65 Walton Ave., New York City.
Willyoung Appliance Co.—Ludlow Station, Yonkers, N. Y.

MAPS

- Autocar, The.**—Coventry, England.
Autoguides Dac.—8 place de la Concorde, Paris, France.
Automobile Road Map.—428 Lafayette St., New York City.
Automobile Topics.—Times Bldg., Times Sq., New York City.
Blondel la Rougery.—24 passage du Havre, Paris, France.
Blue Book.—Class Journal Pub. Co., Flatiron Bldg., New York City.
Campbell.—24 passage du Havre, Paris, France.
Fleming, Institut Cartographique, Carl.—Glogan, Germany.
Gall and Inglis.—Edinburgh, Scotland.
Guide Michelin.—155 bvd. Pereire, Paris, France.
Guide Routier Continental.—146 ave. Malakoff, Paris, France.
Guide Vulcan.—8 place de la Concorde, Paris, France.
Hachette et Cie.—79 bvd. St. Germain, Paris, France.
Johnston, Ltd., W. & A. K.—Edinburgh, Scotland.
Medenhall, C. S.—Race St. and Opera Pl., Cincinnati, O.
Philip & Son, George.—32 Fleet St., London, England.
Taride.—18 bvd. St. Denis, Paris, France.
Taron et Cie.—15 rue des Martyrs, Paris, France.
Temple Press, Ltd.—7 Rosebery Ave., London, E. C., England.
Theuveny.—80 rue Taitbout, Paris, France.

MATS—RUBBER

- Boston Woven Hose & Rubber Co.**—29 Hampshire St., Cambridge, Mass.
Empire Rubber Mfg. Co.—Trenton, N. J.
Goodrich Co., B. F.—Akron, Ohio.
Goshen Rubber Works.—Goshen, Ind.
Manhattan Rubber Co.—18 Vesey St., New York City.
Monarch Rubber Co.—41 N. 7th St., Philadelphia, Pa.
New Jersey Car Spring & Rubber Co.—Wayne & Brunswick Sts., Jersey City, N. J.
Peerless Rubber Mfg. Co.—16 Warren St., New York City.

MATS—RUBBER (Continued)

- Pennsylvania Rubber Co.**—Jeannette, Pa.
Pennsylvania Rubber Co. of New York.—1741 Broadway, New York City.
Trenton Rubber Mfg. Co.—Trenton, N. J.

METALS—BABBITT

- Advance Mfg. Co.**—Todd Bldg., Kalamazoo, Mich.
Clum & Atkinson.—575 Lyell Ave., Rochester, N. Y.
Columbia Smelting & Refining Co.—365-67 West St., New York City.
Cramp & Sons Ship & Engine Building Co.—Philadelphia, Pa.
Fahrig Metal Co.—316 Hudson St., New York City.
Gardiner Metal Co.—454-56 W. Lake St., Chicago, Ill.
Graham & Co., James.—293 Wooster St., New Haven, Conn.
Lumen Bearing Co.—Sycamore St and Belt Line, Buffalo, N. Y.
Magnolia Metal Co.—113-115 Bank St., New York City.
New Era Mfg. Co.—Kalamazoo, Mich.
Palmetto Metal Co.—586 W. Lake St., Chicago, Ill.
Phosper Bronze Smelting Co.—2200 Washington Ave., Philadelphia, Pa.
Pittsburg White Metal Co.—3116-18 Pennsylvania Ave., Pittsburg, Pa.
Reeves & Son, Paul S.—1415 Catharine St., Philadelphia, Pa.
Runskool Metal Co.—1095 Niagara St., Buffalo, N. Y.
Robson Smelting Co.—Broadway and Lathrop St., Buffalo, N. Y.
Shonberg, I.—363 Hudson Ave., Brooklyn, N. Y.
Syracuse Smelting Works.—36th St. and 10th Ave., New York City.
United States Bronze Co.—149 Columbus St., Cleveland, Ohio.
Wildes, Thomas.—246 Water St., New York City.
Williams & Son, E. A.—107 Plymouth St., Jersey City, N. J.

METALS—BRASS AND COPPER

- Advance Mfg. Co.**—Todd Bldg., Kalamazoo, Mich.
Ansonia Brass & Copper Co.—99 John St., New York City.
Boker & Co., Herman.—101 D... New York City.
Bridgeport Brass Co.—Bridgeport
Chicago Brass Co.—Kenosha, W
Clum & Atkinson.—575 Rochester, N. Y.
Columbia Smelting & Refr
67 West St., New York City.
Columbia Smelting & Refining
307 Water St., New York City.
Cramp & Sons Ship & Engine Bui
Co.—Philadelphia, Pa.

METALS—BRASS AND COPPER

(Continued)

- Crescent Phosphorized Metal Co.**—2314-18 Wood St., Philadelphia, Pa.
Detroit Copper & Brass Rolling Mills.—Detroit, Mich.
Electric Smelting & Aluminum Co.—Lockport, N. Y.
Fries & Co.—89-93 Main St., Buffalo, N. Y.
Hungerford Brass & Copper Co.—Pearl and Park Sts., New York City.
Magnolia Metal Co.—113-115 Bank St., New York City.
New Haven Copper Co.—New Haven, Conn.
Randolph-Clowes Co.—Waterbury, Conn.

METALS—BRONZE

- American Bronze Co.**—Berwyn, Pa.
Ansonia Brass & Copper Co.—99 John St., New York City.
Blake, Edwin J.—Hartford, Conn.
Bridgeport Deoxidized Bronze & Metal Co.—Bridgeport, Conn.
Chapman & Co., J. B.—51 Taylor St., Springfield, Mass.
Clark, John W.—A'bandy, N. Y.
Clum & Atkinson.—575 Lyell Ave., Rochester, N. Y.
Columbia Smelting & Refining Co.—365-367 West St., New York City.
Cramp & Sons Ship & Engine Building Co.—Philadelphia, Pa.
Day Foundry Co., The.—Illinois & Mary Sts., Buffalo, N. Y.
Hub Foundry & Plating Co., Inc.—Ossining, N. Y.
Hungerford Brass & Copper Co.—Pearl and Park Sts., New York City.
Lumen Bearing Co.—Sycamore St. & Belt Line, Buffalo, N. Y.
New Era Mfg. Co.—Kalamazoo, Mich.
Phosphor Bronze Smelting Co.—2200 Washington Ave., Philadelphia, Pa.
Providence Brass Foundry and Machine Co.—Providence, R. I.
Reeves & Son, Paul S.—1415 Catherine St., Philadelphia, Pa.
Shonberg, I.—363 Hudson Ave., Brooklyn, N. Y.
United States Bronze Co.—149 Columbus St., Cleveland, Ohio.

PERFORATED

- Co.**—303 Dearborn
 cago, Ill.
n & King Perforating Co.—
 St., Chicago, Ill.
Sons, Chas.—441 Pearl St.,
 & City.
erforating Co.—80 Terrace,
 falo, N. Y.

**METERS—CYLINDER COMPRES-
SION**

- Auto Novelty Co.**—Milwaukee, Wis.
Brown, Henry W.—517-21 E. Water St.,
 Syracuse, N. Y.
Schaefer & Budenberg Mfg. Co.—Fox-
 boro, Mass.
Standard Auto Supply & Mfg. Co.—20
 Broad St., New York City.

MICA

- American Mica Co.**—Newton Lower
 Falls, Mass.
Asheville Mica Co.—Asheville, N. C.
Benford, E. M.—497 Lincoln Ave., Mt.
 Vernon, N. Y.
Black Hills Mica Co.—Auburn, N. Y.
Carolina Locust Pine & Mica Co.—
 Franklin, N. C.
Chicago Mica Co.—Valparaiso, Ind.
Mica Insulator Co.—68 Church St., New
 York City.
Munsell & Co., Eugene.—218 Water St.,
 New York City.
North Carolina Mica Co.—95 Blackstone
 St., Boston, Mass.
Schoonmaker, A. O.—221 Fulton St.,
 New York City.
Sills-Eddy Mica Co.—Newark, N. J.
Vance, D. T.—Plumtree, N. C.
Watson Bros.—Foundry and Division
 Sts., South Boston, Mass.
 (See also Insulators—Mica.)

MIRRORS—WATER COLUMN

- Atwood Mfg. Co.**—Amesbury, Mass.
Knox Co., The Frank J.—Hartford,
 Conn.

MODEL MAKERS, see PATTERNS

MONOGRAMS

- Abbott, W. H.**—1263 Broadway, New
 York City.
Balzer, Gus.—1556 Broadway, New York
 City.
Chandler Co., The.—31 Taylor St.,
 Springfield, Mass.
Childs & Co., S. D.—200 S. Clark St.,
 Chicago, Ill.
Colgan Co., J. W.—Sudbury Bldg., Bos-
 ton, Mass.
Field, Frank C.—605 N. St. Clair St.,
 Toledo, Ohio.
Fine, Horace E.—19 E. State St., Tren-
 ton, N. J.
Hillman Plating Co.—446 Tremont St.,
 Boston, Mass.
Monogram & Crest Sign Co.—125 E. 86th
 St., New York City.

MONOGRAMS (Continued)

- Murdock Co., James Jr.**—116 Opera Pl., Cincinnati, Ohio.
Rees, F. H.—Steel Memorial Bldg., Elmira, N. Y.
Salman & Co., John A.—17 Bromfield St., Boston, Mass.
Stafford Co., N.—67 Fulton St., New York City.
Sturgis, E. A.—179 Summers St., Boston, Mass.
Walter, N. C. & Sons.—194 Williams St., New York City.

MOTORBOAT MANUFACTURERS

- Acker, H.**—Tottenville, Staten Island, New York.
American Boat & Machine Co.—3517 S. 2d St., St. Louis, Mo.
American Dynamic Co.—Port Richmond, N. Y.
American Yacht & Motor Co.—Cherokee and De Kalb Sts., St. Louis, Mo.
Atlantic Co., The.—Amesbury, Mass.
Auto-Boat Co.—West Mystic, Conn.
Ayers & Son, A.—Nyack, N. Y.
Barrett's Son, A.—Camden, Me.
Bath Marine Construction Co.—Bath, Me.
Bay Ridge Launch Works.—Foot 39th St., Brooklyn, N. Y.
Beers Bros. Engine Co.—Rochester, N. Y.
Belle Isle Motor Co.—Detroit, Mich.
Bellows, M. S.—Chateaugay Lake, N. Y.
Benter, Worth S.—Catskill, N. Y.
Brooklyn Launch Works.—Conèy Island, N. Y.
Brooks Boat Mfg. Co.—Bay City, Mich.
Buffum Co., H. H.—Abingdon, Mass.
Burgess & Packard.—Board of Trade Bldg., Boston, Mass.
Camden Anchor-Rockland Machine Co.—Camden, Me.
Carleton Canoe Co.—Old Town, Me.
Chase Yacht & Engine Co.—Providence, R. I.
Church Motor & Launch Co.—62 William St., New York City.
Consolidated Motor Co.—148 W. 56th St., New York City.
Davis Boat Works.—Sandusky, O.
De Foe Boat & Motor Works.—Bay City, Mich.
De Mooy Bros.—765 Wilson Ave., Cleveland, O.
Detroit River Boat & Oar Co., The.—Wyandotte, Mich.
Doman Co., H. C.—Oshkosh, Wis.
Duplex Roller Bushing Co.—Belfast, Me.
Dutton Engineering Co.—Perth Amboy, N. J.
Electric Launch Co., The.—Bayonne, N. J.
Emmons Co., E. Gerry.—Swampscott, Mass.

MOTORBOAT MANUFACTURERS
(Continued)

- Fairbanks-Grant Mfg. Co.**—Ithaca, N. Y.
Fairbanks, Morse & Co.—Chicago, Ill.
Fay & Bowen.—92 Lake St., Geneva, N. Y.
Fraser Hollow Spar & Boat Co.—Greenport, L. I.
Gas Engine & Power Co. and Chas. L. Seabury Co.—Morris Heights, New York City.
Gere Launch & Engine Works.—Yonkers, N. Y.
Globe Iron Works.—Menomonie, Wis.
Globe Boat Co.—Oswego, N. Y.
Godshalk & Co., E. H.—Camden, N. J.
Halesite.—Huntington Harbor, L. I., N. Y.
Hanecraft Co.—Madison, Wis.
Herreshoff Mfg. Co.—Bristol, R. I.
Heppburn, J. W.—Toledo, O.
Holland Launch & Engine Co.—Holland, Mich.
Holmes Motor Co.—West Mystic, Conn.
Huntington Mfg. Co.—New Rochelle, N. Y.
Iowa Marine Engine & Launch Works.—Bellevue, Ia.
Isham Co.—Norwich, Conn.
Jacob, R.—City Island, N. Y.
Jones & Laborde.—Oshkosh, Wis.
Kidney & Son, Dan.—West De Pere, Wis.
Lake Shore Engine Works.—Marquette, Mich.
Lamb Boat & Engine Co.—Clinton, Ia.
Lanley & Son Corp.—South Boston, Mass.
Le Gare, J. L.—Ogdensburg, N. Y.
Leighton, H. J.—Syracuse, N. Y.
Less-More Valveless Engine Co.—N. Tonawanda, N. Y.
Lozier Motor Co., The.—Broadway and 55th St., New York City.
Manhasset Shipbuilding & Repair Co.—Port Washington, L. I., N. Y.
Marblehead Yacht Yard.—Marblehead, Mass.
Marine Eng. & Mach. Co.—Harrison, N. J.
Mather Corporation, The C. B.—56 Merrimac St., Newburyport, Mass.
Matthews Boat Co.—Port Clinton, O.
Medart, Fred.—St. Louis, Mo.
Mianus Motor Works.
Michigan Steel Boat Co.—
 Ave., Detroit, Mich.
Milton Point Shipyard
Milton, T. M.—Br
Minnesota Boat
 Stillwater, Minn.
Mullins Co., W. H.—S
Murray & Tregurtha
 St., Boston, Mass.
New York Kerosene Oil
 31 Burling Slip, New York

MOTORBOAT MANUFACTURERS
(Continued)

N. Y. Yacht, Launch & Engine Co.—Morris Heights, N. Y.
Niagara Motor Boat Co.—Sweeney St., Tonawanda, N. Y.
Nock, F. S.—East Greenwich, R. I.
Norwalk Launch Co.—Norwalk, Conn.
Oshkosh Boat Works.—Oshkosh, Wis.
Outing Boat Co.—Marquette Bldg., Chicago, Ill.
Palmer Bros.—Cos Cob, Conn.
Pelton Gasolene Engine Works.—Lyons, Ia.
Perkins Launch & Motor Co.—Gloucester, Mass.
Peterson, Julius.—Tarrytown, N. Y.
Pierce Engine Co.—Racine Junction, Wis.
Pierson Boat Construction Co.—Duluth, Minn.
Pope Boat Co., The.—Fond du Lac, Wis.
Portage Boat & Engine Co.—Portage, Wis.
Powell's Cove Boat & Engine Co.—College Point, L. I.
Pungs-Finch Co.—Detroit, Mich.
Racine Boat Co.—Racine, Wis.
Racine Boat Mfg. Co.—Muskegon, Mich.
Red Wing Boat Mfg. Co.—Red Wing, Minn.
Rochester Gas Engine Co.—Rochester, N. Y.
Rose, Edw. I.—Fillmore St., Tonawanda, N. Y.
St. Paul Boat Co.—St. Paul, Minn.
Seaman, Wm. A.—Branchport, N. J.
Seitz Co., F. A.—141 Frelinghuysen Ave., Newark, N. J.
Solheim's Launch Works.—Great Kills, Staten Island, N. Y.
Stamford Motor Co.—Stamford, Conn.
Standard Motor Construction Co.—172 Whiton St., Jersey City, N. J.
Stearns & McKay.—Marblehead, Mass.
Sturgeon Bay Boat Mfg. Co.—Sturgeon Bay, Wis.
Thousand Island Boat & Engine Co.—Morristown, N. Y.
Toledo Motor Boat & Power Co., The.—Toledo, O.
Toppan Boat Mfg. Co.—9 Haverhill St., Boston, Mass.
Toquet Launch & Motor Co., The.—Saugatuck, Conn.
Truscott Boat Mfg. Co.—St. Joseph, Mich.
Tuttle Co., D. M.—Canastota, N. Y.
Tuttle Mfg. Co.—South Norwalk, Conn.
Watertown Motor Co.—Watertown, N. Y.
White, T. L.—Manchester, Mass.
Williams-Whittlesey Co.—Long Island City, N. Y.
Wolverine Motor Works.—130 S. Front St., Grand Rapids, Mich.

MOTORBOAT MANUFACTURERS
(Continued)

Wood, B. F.—City Island, N. Y.
Wright, W. G.—Paulsboro, N. J.
Yacht, Launch & Eng. Co.—Philadelphia, Pa.

MOTOR GENERATORS

General Electric Co.—Schenectady, N. Y.
Holtzer-Cabot Electric Co.—Brookline, Mass.

MOTORS — AERONAUTIC, GASOLINE

Aero & Marine Motor Co.—60 Pemberton Square, Boston, Mass.
Antoinette, Société.—10 rue des Bas Rogers, Puteaux, France.
Bozier, G.—7 rue Denis Pepin, Puteaux, France.
Buchet, Usines.—Levallois-Perret, France.
Herschell & Spillman Co.—North Tonawanda, N. Y.

MOTORS — AUTOMOBILE GASOLINE

Aachener Stahlwaarenfabrik Actiengesellschaft.—Aix-la-Chapelle, Germany.
Adami e Cie.—via degli Artisti, Florence, Italy.
Adolf Ungers Industriaktiebolag.—Arbra, Sweden.
Advance Mfg. Co.—B St., 2 Blocks North of Main St., Hamilton, Ohio.
Aktiebolagee Octopedmotorbiblioteks-golau.—Stockholm, Sweden.
Alexander & Co.—72 W. Monroe St., Chicago, Ill.
American Die & Tool Co.—Reading, Pa.
American Mica Co.—Newton Lower Falls, Mass.
Anderson Engine Co.—Shelbyville, Ill.
Antoine fils et Cie.—41 quai St. Leonard, Liege, Belgium.
Antoinette, Société.—10 rue des Bas Rogers, Puteaux, France.
Aquila, Fabbrica Italiana di Automobile.—9 via Bonsignore, Turin, Italy.
Argus Chenu.—10 rue Fontaine St., Georges, Paris, France.
Argus Motoren Gesellschaft, Jeannin und Co.—1 Prinz Luis Ferdinandstrasse, Berlin, Germany.
Armac Motor Co.—472-78 Carroll Ave., Chicago, Ill.
Aster, Société'l.—St. Denis, France.
Ateliers Amstoutz et Ravel.—ave. de Fontaine, Argent, Besançon, Doubs, France.
Ateliers de Constructions Mécaniques.—105 rue de Fazilleau, Levallois, France. (Signia motors.)
Automobil und Motorfahrzeugfabrik.—140 Greifswalderstrasse, Berlin, Germany.

MOTORS—AUTOMOBILE, GASOLINE (Continued)

Automobilwerke Leipzig.—35 Carl Heine Strasse, Leipzig, Platzwitz, Germany.
Badecker Gas Engine Co.—Omaha, Neb.
Balancemobil Werke, C. E. Buhler.—Buttstadt im Thüringen, Germany.
Ballot et Cie.—105 bvd. Brune, Paris, France.
Barber Bros.—101 Grape St., Syracuse, N. Y.
Barriquand et Marre, Ateliers.—127 rue Oberkampf, Paris, France.
Belcher Motor Co.—Fall River, Mass.
Bendix Co., The.—2107 N. 9th St., Chicago, Ill.
Ben Hur Motor Co.—120 Randolph St., Chicago, Ill.
Benz und Co., Rheinische Gasmotorenfabrik, Actiengesellschaft.—Mannheim, Germany.
Beverly Mfg. Co.—Beverly, Mass.
Bowen Motor Co.—419 Auburn Ave., Buffalo, N. Y.
Bozier, G.—7 rue Denis Papin, Puteaux, France.
Bradley Motor Patents, Ltd.—165 Fenchurch St., London, E. C., England.
Brennan Motor Co.—Syracuse, N. Y.
Briggs & Wade.—Sagamore St., Lynn, Mass.
Brillié, Automobiles Eugene.—Havre, France.
Brixton Motor Works.—283 Brixton Road, London, S. W., England.
Brouhot, Usines.—Vierzon, Cher, France.
Brownell Motor Co., F. A.—634-6 Lexington Ave., Rochester, N. Y.
Brown-Talbot Co.—19 Oakland St., Salem, Mass.
Buchet, Usines.—Levallois-Perret, France.
Buffalo Engine Co.—12-20 Perry St., Buffalo, N. Y.
Bielfuss Motor Co.—Saginaw St. and M. C. Railway, Lansing, Mich.
Burlat Frères.—85 bis cours Lafayette Prolonge, Lyon, Villeurbanne, France.
Burt Mfg. Co.—128 N. Edward St., Kalamazoo, Mich.
Chase Motors.—Station Road, Adderley, London, S. E., England.
Clark Motor Co., E. C.—Jackson, Mich.
Cohendet et Cie, A.—166 quai Jemappes, Paris, France.
Compagnie Belges de Construction d'Automobiles.—10 rue Ruysdael, Brussels, Belgium.
Compagnie Duplex.—Ferrière-la-Grande, Nord, France.
Continental Motor Mfg. Co.—Muskegon, Mich.
Cremorne Motor Mfg. Co.—Lots Road, Chelsea, London, S. W., England.

MOTORS—AUTOMOBILE, GASOLINE (Continued)

Cross Engine Co., M. O.—800-806 Bellevue Ave., Detroit, Mich.
Crouch & Co., Chas. P.—484 Carroll Ave., Chicago, Ill.
Cudell und Co.—46 Ruckersdorferstrasse, Berlin, Germany.
Cushman Motor Co.—2020 North St., Lincoln, Neb.
Dalifol et Cie.—40 bvd. d'Asnières, Ile-de-la-Jatte, Neuilly, France.
Dasse, Gérard.—Verniers, Belgium.
Davis Mfg. Co.—935 30th St., Milwaukee, Wis.
Decauville, Société Nouvelle des Établissements.—Petit-Bourg, Seine-et-Oise, France.
de Dion, Bouten et Cie.—quai National, Puteaux, France.
Dempster Machine Co., W. R., The.—16th and Walnut Sts., Kansas City, Mo.
Deschler, August.—18-20 E. Water St., Chillicothe, Ohio.
Dop.—16 rue du Débarcadère, Paris, France.
Edler, X.—Hirson, Aisne, France.
Entrepot General d'Automobiles.—211 bvd. Pereire, Paris, France.
Español-Suiza, Sociedad Anonima.—Barcelona, Spain.
Fabbrica di Automobili "Florentia."—via Ponte all'Asse, Florence, Italy.
Fabrique de Moteurs Zedel, Société Anonyme.—Pontarlier, Doubs, France.
Fairbanks-Grant Mfg. Co.—Ithaca, N. Y.
Farcot Frères et Cie.—St. Ouen, France.
Ferro Machine & Foundry Co.—115 Wade Bldg., Cleveland, Ohio.
Filtz, J.—13 ave. du Roule, Neuilly, France.
Forman Motor Mfg. Co.—Dayslane, Coventry, England.
Fowler Machine Co.—1781 Middlesex St., Lowell, Mass.
Frishi Motor & Machine Works.—Middletown, Conn.
Fullgarus Gjuleri & Mekineriverkstad-saktiebolag.—Upsala, Sweden.
Furan, Société des Ateliers du.—4 rue Barrouin, St. Etienne, France.
Gautier, Paul.—11 rue Taine, Paris, France.
Germain, Ateliers.—Monceau-sur-Sambre, Charleroi, Belgium.
Goshen Motor Works.—Ave. and 9th St., Goshen, I.
Grade Motorwerke.—Magde many.
Grant-Ferris Co.—Troy, N.
Guerin Frères.—10 rue de France.
Haney Gas Engine Co.—I
Harvard Marine & Auto Co.—25 St., Cambridge, Mass.
Hayden Co., N. L.—Columbus, Oh

MOTORS—AUTOMOBILE, GASOLINE (Continued)

- Herald, Société Anonyme des Moteurs et Automobiles.**—7 rue Carnot, Levallois, France.
- Herluison, Clement.**—Route de Paris, Nangis, Seine-et-Marne, France.
- Herschell-Spillman Co.**—North Tonawanda, N. Y.
- Hoffman & Billings Mfg. Co.**—Milwaukee, Wis.
- Homan, J. & E.**—380 West Broadway, New York City.
- Houle Motor Works, A. J.**—Holyoke, Mass.
- Hubbard Motor Co.**—Middletown, Conn.
- Ideal Mfg. Co.**—Portsmouth, O.
- Illinois Auto & Parts Co.**—Globe and Main Sts., Peoria, Ill.
- Isotta Fraschini, Societe Anomima.**—79 rue Monta Rosa, Milan, Italy.
- Ivel Agricultural Motors, Ltd.**—45 Great Marlborough St., London, England.
- Jencick Motor Mfg. Co.**—Port Chester, N. Y.
- Johnson Motor Co., The.**—Chester, Pa.
- Joos Söhne und Co.**—51 Schwanthalerstrasse, Munich, Germany.
- Kahlenberg Bros.**—Two Rivers, Wis.
- Kirkham Motor Mfg. Co.**—Bath, N. Y.
- Koerting, Gebrüder.**—Koertingsdorf, Hanover, Germany.
- Kolb, Charles, Edouard.**—18 place de la Chapelle, Paris, France.
- Kortings Slepner Motoren.**—60 Badentstetern, Hanover, Germany.
- Kunze und Co.**—Gros-Zschachwitz, Dresden, Germany.
- Lagonda Motor Co., Ltd.**—Thorpe Road, Staines, London, England.
- Lamb Boat & Engine Co.**—Clinton, Ia.
- Legros & Knowles.**—Cumberland Park, Willesden Junction, London, England.
- Legros & René.**—16 rue de l'Inundation, Fécamp, France.
- Linon, L. Ensival.**—Veroiers, Belgium.
- Lotteau frères.**—14 rue du Pont, Choisy-le-Roi, France.
- Marcel, R.**—239 bvd. Pereire, Paris, France.
- Marchand-Dufaux, Fabbrica Italiana di Vettura Automobile.**—Plaisance, Italy.
- Martin et Lethimonnier.**—32 rue Felicien-David, Paris, France.
- Michigan Automobile Co., Ltd.**—Kalamazoo, Mich.
- aukee Auto Engine Supply Co.**—88 Winnebago St., Milwaukee, Wis.
- aukee Motor Co.**—615 Clyborn Ave., Milwaukee, Wis.
- Automobile Co.**—Peru, Ind.
- ine Pump Co.**—Moline, Ill.
- Ateliers de Constructions Mecaniques.**—173 bvd. Pereire, Paris France.
- auban-Marchandier, Société Anonyme des Etablissements.**—33 ave. d'Idherbe, St. Quentin, France.

MOTORS—AUTOMOBILE, GASOLINE (Continued)

- Motorenfabrik Magnet.**—Weissemsee, Berlin, Germany.
- Motor Engineering Co.**—15 Verulam St., London, W. C., England.
- Motor Mfg. Co., Ltd.**—Coventry, England.
- Murry, W. B.**—1253 Milwaukee Ave., Chicago, Ill.
- Mutel et Cie.**—124 rue St. Charles, Paris, France.
- Nagant freres.**—44 quai Coronmeneuse, Liege, Belgium.
- Neckarsulmer Fahrradwerke Actiengesellschaft.**—Neckarsulm, Württemberg, Germany.
- Neer Air Cooled Engine Co.**—Plain City, Ohio.
- New Engine Co.**—Acton, London, W., England.
- North Chicago Machine Co.**—North Chicago, Ill.
- Northway Motor & Mfg. Co.**—Grand Ave., Detroit, Mich.
- Nutting Machine Co.**—Dayton, Ohio.
- Oesterreichisch Maschinen Actiengesellschaft.**—Vienna, Austria.
- O. K. Gas Engine Works.**—Winchester, Ohio.
- Oswald Motor Co.**—Goshen, Ind.
- Otto Gas Engine Works.**—33rd & Walnut Sts., Philadelphia, Pa.
- Palmer-Moore Co.**—Syracuse, N. Y.
- Panhard et Levassor, Société Anonyme des Anciens Etablissements.**—19 rue d'Ivry, Paris, France.
- Pennsylvania Iron Works Co.**—5th and Lancaster Ave., Philadelphia, Pa.
- Peugeot, A., Tony Huber et Cie.**—56 rue du Vieux-Pont-de-Sevres, Billancourt, France.
- Phillips Motor Works, W. L.**—405 Tacoma Bldg., La Salle and Madison Sts., Chicago, Ill.
- Picker, Moccand et Cie., Société Anonyme des Anciens Etablissements.**—78 Chene-Bougeries, Geneva, Switzerland.
- Piedboeuf, Ateliers.**—63 rue de Fragnee, Liège, Belgium.
- Pierce Engine Co.**—Racine Junction, Wis.
- Pittsburg Machine Co., The.**—New Brighton, Pa.
- Putnam Motor Mfg. Co.**—57 Lebanon St., Springfield, Mass.
- Putney Motor Co., Ltd.**—17 Grand Parade, Upper Richmond Road, London, S. W., England.
- Rebour, J.**—3 rue Ampere, Puteaux, France.
- Record Motor Co.**—585 Stoneystanton Road, Coventry, England.
- Reeves Pulley Co.**—1225 Seventh St., Columbus, Ind.

LIFTERS—VALVE

- Automobile Specialty Co.**—509 Willoughby Bldg., Chicago, Ill.
Auto Specialty Co.—6 E. Madison St., Chicago, Ill.
Noonan Tool & Machine Works.—Rome, N. Y.
Polson, W. F.—22 W. Utica St., Buffalo, N. Y.
White, Sam B.—91 Sabin St., Providence, R. I.

LOCKERS

- Art Metal Construction Co.**—Jamestown, N. Y.
Darby & Sons Co., Edward.—233 Arch St., Philadelphia, Pa.
Merritt & Co.—1022-30 Ridge Ave., Philadelphia, Pa.
Ohnstrand & Son, H. R.—413 S. Clinton St., Syracuse, N. Y.

LUBRICATORS

- Adapt Machinery Co.**—1624-34 Wabash Ave., Chicago, Ill.
American Injector Co.—Detroit, Mich.
American Lubricator Co.—Detroit, Mich.
Bailly, C.—168 bvd. de la Villette, Paris, France.
Ben Hur Motor Co.—120 Randolph St., Chicago, Ill.
Blanke und Rast.—Leipzig, Plagwitz, Germany.
Briet et Cie., M.—7 rue Magenta, Puteaux, France.
Cailleau et Cie.—20 rue des Walloons, Liege, Belgium.
Charter & Co.—303 Dearborn St., Chicago, Ill.
Couteau, H.—95 rue d'Angouleme, Paris, France.
de Boisse, J.—85 rue Traverssière, Billancourt, Seine, France.
Detroit Lubricator Co.—Trumbull and Lincoln Aves. and G. T. Ry., Detroit, Mich.
Dodge Lubricator Co.—8 Waltham St., Boston, Mass.
Draper Co., Walter H.—120 S. Railroad Ave., Mt. Vernon, N. Y.
Dubulle, Louis.—28 rue Villeneuve, Clichy-sur Seine, France.
Elevator Supply & Repair Co.—76 W. Monroe St., Chicago, Ill.
Frasze & Co., Peter A.—92-4 Fulton St., New York City.
Gauthier et Trentelivres.—30 rue de Malines, Brussels, Belgium.
Greene, Tweed & Co.—17 Murray St., New York City.
Guyénet, J.—rue de Printemps, Paris, France.
Hamelle, H.—21 quai Valmy, Paris, France.

LUBRICATORS (Continued)

- Hancock Mfg. Co.**—770 E. Henry St., Charlotte, Mich.
Hatcher Auto Parts Co.—2108 Superior Ave., Cleveland, Ohio.
Hill, E. H., Beta Works.—56 Bromfield St., Sheffield, England.
Hussenet et Raynaud.—39 rue La Boétie, Paris, France.
Kinsey Mfg. Co.—Dayton, Ohio.
Lavigne Mfg. Co.—Detroit, Mich.
Lee Injector Co.—Port Huron, Mich.
Lafeyvre fils, Albert.—5 rue Delteral, Pré St. Gervais, Seine, France.
Liotard Frères.—22 rue de Lorraine, Paris, France.
Lonegran & Co., J. E.—211-215 Race St., Philadelphia, Pa.
Longhurst, Jas. S., Jr.—Walnut St., Lynbrook, L. I., N. Y.
Lunkenheimer Co., The.—Cincinnati, Ohio.
Manzel Bros. Company.—317-319 Babcock St., Buffalo, N. Y.
McCanna Mfg. Co.—56 N. Jefferson St., Chicago, Ill.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Michigan Lubricator Co.—661-67 Beau-pien St., Detroit, Mich.
Mosher Sales Co.—32 St. Paul St., Rochester, N. Y.
Muller et Cie., Roger.—108 ave. Philippe-Auguste, Paris, France.
National Sewing Machine Co.—Belvidere Ill.
Neely, Edward.—244 Wells St., Chicago, Ill.
Noera Mfg. Co.—Waterbury, Conn.
Officina San Giorgio.—via Valperga Caluso, Turin, Italy.
Oger et Guérin.—36 rue Godefroy-Cavaignac, Paris, France.
Ohio Brass Co.—Mansfield, Ohio.
Palous und Beuse.—Zimmerstrasse 30, Berlin, Germany.
Pedersen Mfg. Co.—400-412 E. 37th St., New York City.
Peeters, Cl.—85 rue Heyvaert, Molenbeek-Brussels, Belgium.
Penberthy Injector Co.—Detroit, Mich.
Piccoli Fratelli e Ca.—via Capellari Milan, Italy.
Powell Co., William, The.—2525-2531 Spring Grove Ave., Cincinnati, Ohio.
Precision Appliance Co.—Chicago, Ill.
Redington & Co., F, B—gamon St., Chicago,
Roller et Cie.—67 ave. France.
Ross, Courtney and C—brooke Road, Upper H don, N., England.
Rotherham and Sons.—C land.

LUBRICATORS (Continued)

Schaeffer und Oehlmann.—Chaussee-
strasse 46, Berlin, N., Germany.
Schoelkopf Mfg. Co.—Madison, Wis.
Sclaverand, Morin Successeur.—48 rue de
l'Aqueduc, Paris, France.
Sherwood Mfg. Co.—Elmwood Ave. and
Belt Line, Buffalo, N. Y.
Standard Automobile Lubricator Co.—
361-63 Ellicott St., Buffalo, N. Y.
Standard Gauge Mfg. Co.—Industrial
Bldg., Syracuse, N. Y.
Sturtevant Mill Co.—Harrison Sq., Bos-
ton, Mass.
Thevenin Freres, Seguin et Cie.—116
bvd. Richard-Lenoir, Paris, France.
Turner Brass Works, The.—72 Michigan
St., Chicago, Ill.
Wanner et Cie.—67 ave. de la Repub-
lique, Paris, France.
Weidner, Richard.—Leipzig, Germany.
Williams Valve Co., D. T.—904-10 Broad-
way, Cincinnati, Ohio.
Winkley Co., The.—226 Abbot St., De-
troit, Mich.

**MACHINES, BUFFING, see BUF-
FERS**

MACHINES—MILLING

Becker-Brainard Milling Machine Co.—
110 Business St., Hyde Park, Mass.
Cincinnati Milling Machine Co.—Cincin-
nati, Ohio.
Gisholt Machine Co.—1300 Washington
Ave., Madison, Wis.
Whitney Mfg. Co.—Hartford, Conn.

**MACHINES, PORTABLE DRILLING,
see DRILLS, MACHINE, PORT-
ABLE**

**MACHINES—TUFTING AND UP-
HOLSTERING**

Novelty Tufting Machine Co.—1200
Michigan Ave., Chicago, Ill.

MACHINE WORK—TO ORDER

American Die & Tool Co.—Reading, Pa.
American Machine & Mfg. Co., The.—
Cleveland, Ohio.
Ashley Machine Works.—714 University
Ave., Rochester, N. Y.
Beverly Mfg. Co.—Beverly, Mass.
Blake & Johnson.—Waterbury, Conn.
Whitman Co.—94-104 W. 7th
St., N. J.
Machine & Foundry Co.—115
1st St., Cleveland, Ohio.
Fulton St., New
York City.
Machine Screw Co.—476 Capi-
toul St., Hartford, Conn.

**MACHINE WORK—TO ORDER
(Continued)**

Hill Co., Geo. Q.—326 A St., Boston,
Mass.
Holt & Co., W. H.—95 Pine St., Provi-
dence, R. I.
Homer Brass Works.—231 Race St.,
Philadelphia, Pa.
Hopson & Chapin Mfg. Co.—New Lon-
don, Conn.
Jones, Frank S.—629 Filbert St., Phila-
delphia, Pa.
Jones Motor Co., Geo. H.—6th St.,
Camden, N. J.
Konigslow Mfg. Co., Otto.—2279 Clark-
wood Rd., Cleveland, O.
Lee Mfg. Co., The.—Connors St., Port
Huron, Mich.
**Lippincott Steam Specialty & Supply
Co.**—Newark, N. J.
Machinery Forging Co.—Hamilton &
Marquette Sts., Cleveland, Ohio.
Manufacturers Foundry Co.—Waterbury,
Conn.
Massnick Mfg. Co.—1567 River St., De-
troit, Mich.
McCutchen Gear & Mfg. Co.—205 W.
South St., Indianapolis, Ind.
Michigan Automobile Co., Ltd.—Kala-
mazoo, Mich.
Muncie Auto Parts Co.—Ellicott St. and
L. E. W. Yards, Muncie, Ind.
National Cycle Mfg. Co.—Bay City,
Mich.
Pacific Iron Works, Inc.—Bridgeport,
Conn.
Patterson, Gottfried & Hunter, Ltd.—
146-50 Center St., New York.
Pattinson Mfg. Co.—48 Stanhope St.,
Boston, Mass.
Pittsburg Brass Mfg. Co.—3153 Penn
Ave., Pittsburg, Pa.
Rhode Island Machine Co., The.—Provi-
dence, R. I.
Standard Metalwork Co.—Thompson-
ville, Conn.
Taft, Pierce Co.—Woonsocket, R. I.
Throop Perforating Co.—80 Terrace,
Buffalo, N. Y.
Widmer Machine Works.—43-47 Fort
St., E., Detroit, Mich.

**MACHINERY—SPECIAL AUTOMO-
BILE**

Adams Co., The.—Dubuque, Iowa.
American & British Mfg. Co.—Gov't.
Contractors, Crescent Ave., Bridge-
port, Conn.
Baker Bros.—Westlake and Post Sts. and
M. C. R. R., Toledo, Ohio.
Barnes Co., W. F. & John.—Rockford,
Ill.
Beaman & Smith Co., The.—Providence,
R. I.
Becker-Brainard-Milling Machine Co.—
110 Business St., Hyde Park, Mass.

MOTORS—AUTOMOBILE, GASOLINE (Continued)

Ribettie Colombatto.—via Bava, Turin, Italy.
Richard, G.—108 rue St. Maur, Paris, France.
Rigaud, A.—251 rue du faubourg de Roubaix, Lille, France.
Robberts, R. M.—140 Indiana Ave., Anderson, Ind.
Rockford Automobile & Engine Co.—Rockford, Ill.
Roots Oil Motor & Motor Car Co., Ltd.—Chichelly St., York Rd., Lambeth, London, England.
Rosselli.—29 via Nizza, Turin, Italy.
Royal Motor.—15 bvd. de Strasbourg, Boulogne-sur-Seine, France.
Ryde Motors, Ltd.—Grosvenor Road, Westealing, London, W., England.
Schlosser Mfg. Co.—151 E. 126th St., New York City.
Schonlein, P.—32 Frankfurterstrasse, Wiesbaden, Germany.
Simms Mfg. Co., Ltd.—Kimberley Road, Kilburn, London, N. W., England.
Sintz, Guy L.—Fulton and Front Sts., Grand Rapids, Mich.
Smith, Chas. A.—Church Lane and P. & R. Ry., Germantown, Philadelphia, Pa.
Société Anonyme des Brevets et Moteurs Létombe.—59 rue d'Amsterdam, Paris, France.
Société Anonyme Muller-Vogel et Cie.—St. Aubin, Neufschatel, Switzerland.
Société des Moteurs Gnome.—Petit-Gennevilliers, Seine, France.
Société Neufchateloise d'Automobiles.—Boudry-Néufchatel, Switzerland.
Solos Motoren Gesellschaft.—Gottleutstrasse 94 Frankfort-am-Main, Germany.
Speed Changing Pulley Co.—750 E. Washington St., Indianapolis, Ind.
Stamford Motor Co., The.—Stamford, Conn.
Sterling Engine Co.—Fall River, Mass.
Stevens Motor Mfg. Co., Ltd.—Pelham St., Wolverhampton, England.
Stimula.—St.-Chamond, Loire, France.
Streit Machine Co., A.—1108-10 Harrison Ave., Cincinnati, Ohio.
Sturtevant Mill Co.—Harrison Sq., Boston, Mass.
Swain Engine Co.—2239 State St., Chicago, Ill.
Theim Mfg. Co.—Minneapolis, Minn.
Toutain fils, Frémy et Cie.—4 rue Thiéban, Havre, France.
Trebert Gas Engine Co.—35-37 Ford St., Rochester, N. Y.
Trenton Malleable Co., The.—New York Ave., Trenton, N. J.
Truscott Boat Mfg. Co.—St. Joseph, Mich.
United Mfg. Co.—175 Woodbridge St., Detroit, Mich.

MOTORS—AUTOMOBILE, GASOLINE (Continued)

Vallade et Cie.—116 bvd. Percire, Paris, France.
Van Auken Cleavance Co.—Yonkers, N. Y.
Volker und Prugel.—Obernberg-am-Main, Bavaria, Germany.
Warren Mfg. Co.—Warren, Mass.
Watermans Marine Motor Co.—1506-12 Fort St., W., Detroit, Mich.
Watt Engnie Co.—Port Huron, Mich.
Weidmann et Cie.—93 Brunnaustrasse, Zürich, Switzerland.
Westerfield Motor Co., The.—1525 S. Main St., Anderson, Ind.
Willet Engine & Carbureter Co.—764 Ellicott Sq., Buffalo, N. Y.
Windhoff, Gebruder.—Rheine-im-Westphalia, Germany.
White & Poppe, Ltd.—Coventry, England.
Whitley Motor & Engineering Co.—Fleet St., Coventry, England.
Xardell Co., C. A.—Utica, N. Y.
Yocom Co., A. H.—Reading, Pa.
Zust, Roberto.—via Borgogne, Milan, Italy.

MOTORS—ELECTRIC

Browning Mfg. Co.—Milwaukee, Wis.
Bullock Electric Mfg. Co.—Cincinnati, Ohio.
Eddy Electric Mfg. Co.—Windsor, Conn.
C. & C. Electric Co.—143 Liberty St., New York City.
Electric Vehicle Equipment Co.—20th St. and Montgomery Ave., Philadelphia, Pa.
Elwell Parker Electric Co.—1076 Hamilton St., Cleveland, Ohio.
Fairfield Motor Co.—172 Cannon St., Bridgeport, Conn.
Fort Wayne Electric Works.—Fort Wayne, Ind.
Gilmore Electric Co.—625 First St., Boston, Mass.
Kendrick & Davis.—Lebanon, N. H.
Lamb Electric Co.—31 Canal St., Grand Rapids, Mich.
Lincoln Electric Co.—Cleveland, Ohio.
Milwaukee Electric Co.—Milwaukee, Wis.
Parsell & Weed.—129-131 W. 31st St., New York City.
Richardson Engineering.—Conn.
Roth Bros. & Co.—27-29 Chicago, Ill.
Sprague Electric Co.—527 New York City.
Sterling Electric Motor.—Ohio.
Storey Motor & Electric.—sex St., Harrison, N. J.

MOTORS—ELECTRIC (Continued)

Wagner Electric Mfg. Co.—St. Louis, Mo.
Westinghouse Electric & Mfg. Co.—Pittsburg, Pa.
Witherbee Mfg. Co., Inc.—433 W. 42nd St., New York City.

MOTORS—KEROSENE

Acme Oil Engine Co.—Union Ave., near R. R., Bridgeport, Conn.
American Diesel Oil Engine Co.—11 Broadway, New York City.
Fay & Bowen Engine Co.—92 Lake St., Geneva, N. Y.
Grand Rapids Gas Engine & Yacht Co.—Grand Rapids, Mich.
International Power Vehicle Co.—216 Pacific St., Stamford, Conn.
Mietz, A.—138 Mott St., New York City.
New York Kerosene Oil Motor Co.—31 Burling Slip, New York City.
Wolverine Motor Works.—Grand Rapids, Mich.

MOTORS—MARINE, GASOLENE

Ader, Société Anonyme des Anciens Etablissements.—40ter ave. de Suffren, Paris, France.
Aero & Marine Motor Co.—60 Pemberton Square, Boston, Mass.
Alexander & Co.—72 W. Monroe St., Chicago, Ill.
American Mica Co.—Newton Lower Falls, Mass.
Anderson Engine Co.—Shelbyville, Ill.
Atlantic Co., The.—Amesbury, Mass.
Ateliers de Construction.—50 ave. de Normandie, Colombes, France.
Ateliers et Chantiers Cosmos.—Ostend, Belgium.
Aurora Motor Works.—North Aurora, Ill.
Automatic Machine Co., The.—Bridgeport, Conn.
Ayres Gasoline Engine Works.—Saginaw, Mich.
Badecker Gas Engine Co.—Omaha, Neb.
Badger Motor Co.—Milwaukee, Wis.
Ballot et Cie.—105 bvd. Brune, Paris, France.
Bay State Machine Co.—1302-06 Peach St., Erie, Pa.
Belcher Motor Co.—Fall River, Mass.
Beverly Mfg. Co.—Beverly, Mass.
Bonnet.—4 rue de la Bastelle, Paris, France.
Boudreaux, L.—8 rue Hautefeuille, Paris, France.
Brennan Motor Co.—Syracuse, N. Y.
Bridgeport Motor Co.—Bridgeport, Conn.
Briggs & Wade.—Sagamore St., Lynn, Mass.

MOTORS—MARINE, GASOLENE (Continued)

Brill Engine Works.—Appleton, Wis.
Brooks Boat Mfg. Co.—Saginaw, Mich.
Brooke & Co., Ltd., J. W.—Adrian Works, Lowestoft, England.
Brown-Cochran Co., The.—Loraine, O.
Brownell Motor Co., F. A.—623-6 Lexington Ave., Rochester, N. Y.
Bruno-Knapp Co., W. S.—Saginaw, Mich.
Budd & Ranney Mfg. Co., The.—35-37 S. Scioto St., Columbus, Ohio.
Buffalo Gasoline Motor Co.—1280-90 Niagara St., Buffalo, N. Y.
Burlat Frères.—89 bis cours Lafayette plg., Lyon-Villeurbanne, France.
Caille Bros. Co., The.—Second Ave. and Amsterdam St., Detroit, Mich.
Camden Anchor-Rockland Machine Co.—Camden, Maine.
Campbell Motor Co.—Wayzata, Minn.
Carlson, Chas. A.—1016 Bedford Ave., Brooklyn, N. Y.
Chase Motor Co.—201 Pitman St., Providence, R. I.
Crouch & Co., Chas. P.—484 Carroll Ave., Chicago, Ill.
Chicago Caloric Engine Co.—Chicago, Ill.
Clark, Ed. S.—242 Freeport St. Boston, Mass.
Clemick-Hirsch Co.—594 National Ave., Milwaukee, Wis.
Clifton Motor Works.—265 E. Clifton Ave., Cincinnati, Ohio.
Coleman & Sons, Walter.—300 S. Water St., Providence, R. I.
Continental Motor Mfg. Co.—Muskegon, Mich.
Cooley Mfg. Co.—Waterbury, Vt.
Couach et fils, J.—39 bvd. d'Haussez, Arcachon, Gironde, France.
Craig, James.—556 W. 34th St., New York City.
Cross Engine Co., M. O.—800-06 Bellevue Ave., Detroit, Mich.
Cushman Motor Co.—2020 North St., Lincoln, Neb.
Daimler Motoren Gesellschaft.—Unterturkheim, Germany.
Dean & Bruden Bros., Ltd.—Salisbury, England.
Dechartres, E.—3 cite des Enoierges, Paris, France.
de Dion, Bouten et Cie.—quai National, Puteaux, France.
De Moory Bros.—765-767 Wilson Ave., Cleveland, Ohio.
Detroit Auto Marine Co.—82 Congress St., E., Detroit, Mich.
Dingfelder Motor Co.—Detroit, Mich.
Doman Co., H. C.—Oshkosh, Wis.
Dressler, W.—14 Annenstrasse, Berlin, Germany.

MOTORS—MARINE. GASOLENE
(Continued)

Ducro Mfg. Co.—1378 Niagara St., Buffalo, N. Y.
Duluth Gas Engine Works.—Minnesota Ave. and Vine St., Duluth, Minn.
Dunn, Walter E.—Ogdensburgh, N. Y.
Duplex Roller Bushing Co.—Belfast, Me.
Easternhouse Engine Co.—Taunton, Mass.
Echo Company.—Young and Delaware Sts., Tonawanda, N. Y.
Eclipse Engine Works.—Mancelona, Mich.
Eggermont, M. E.—9 rue du Petit-Dock, Gand, Belgium.
Erd Motor Co.—Saginaw, Mich.
Español-Suiza, Sociedad Anonima.—Barcelona, Spain.
Essex Engine Co.—416 Union, Lynn, Mass.
Fabbrica Italiana Automobili di Torino.—35 Corso Dante, Turin, Italy.
Fabbrica Ligure di Automobili di Genova.—2 piazzetta Covetto, Genoa, Italy.
Fairbanks-grant Mfg. Co.—Ithaca, N. Y.
Fairbanks, Morse & Co.—Franklin and Monroe Sts., Chicago, Ill.
Fairfield Motor Co.—172 Cannon St., Bridgeport, Conn.
Fay & Bowen Engine Co.—92 Lake St., Geneva, N. Y.
Fowler Machine Co.—1781 Middlesex St., Lowell, Mass.
Fox Reversible Gasoline Engine Co.—Covington, Ky.
Freeland Sons Co., B. F.—Sturgis, Mich.
Gas Engine & Power Co.—Morris Heights, New York City.
Germain Ateliers.—Monceau-sur-Sambre, Charleroi, Belgium.
Gibson Co., Wm. D.—Huron and Kingsbury Sts., Chicago, Ill.
Goshen Motor Works, The.—Lincoln Ave. and 9th St., Goshen, Ind.
Grand Rapids Gas Engine & Yacht Co.—Grand Rapids, Mich.
Grant Mfg. & Machine Co.—90 Sillman Ave., Bridgeport, Conn.
Gray & Prior Machine Co.—Hartford, Conn.
Gray Motor Co.—Lieb and Larned Sts., Detroit, Mich.
Green Bay Machine Co.—Green Bay, Wis.
Haase Motor Works.—1019 Lloyd St., Milwaukee, Wis.
Haney Gas Engine Co.—Ligonier, Ind.
Harvard Marine & Auto Co.—25 Elliot St., Cambridge, Mass.
Hasbrouck Motor Works, Inc.—155 Water St., New London, Conn.
Heinel Co., H. A.—Wilmington, Del.

MOTORS—MARINE, GASOLENE
(Continued)

Hersant et Rousseau.—1 rue Banier, Nantis, France.
Herschell-Spillman Co.—North Tonawanda, N. Y.
Hildreth Mfg. Co., The.—Lansing, Mich.
Hill, R. S.—78 E. Fort St., Detroit, Mich.
Hoffman Launch & Motor Works.—1253 North Halstead St., Chicago, Ill.
Holliday Mfg. & Engineering Co.—160 Bunker St., Chicago, Ill.
Holmes Motor Co.—West Mystic, Conn.
Houle Motor Works, A. J.—Holyoke, Mass.
Howe Scale Co.—509 Market St., Philadelphia, Pa.
Ross, H. S.—5607 S. Halsted St., Chicago, Ill.
Hubbard Motor Co.—Middletown, Conn.
Hurd & Haggin.—313 Hudson St., New York City.
Ideal Mfg. Co.—Portsmouth, Ohio.
Jackson Machine Works.—Traverse City, Mich.
Jager Gas Engine Co.—33 Canal St., Providence, R. I.
Craig, James.—556 W. 34th St., New York City.
Jencick Motor Mfg. Co.—Port Chester, N. Y.
Keidel & Co., Henry.—Baltimore, Md.
Kensington Motor Boat Co., Ltd.—64 Avonmore Road, London, W., England.
Kortings Sleipner Motoren.—60 Badenstedtersn, Hanover, Germany.
Kowalsky Engine Co., The J.—Grant St. and Railroad Ave., Verona, Pa.
Lackawanna Mfg. Co.—Newburg, N. Y.
Lathrop, J. W.—Mystic, Conn.
Leighton, H. J.—901 Lafayette St., Syracuse, N. Y.
Lockward-Ash Motor Co.—Jackson, Mich.
Massey Machine Co.—Pearl St., Watertown, N. Y.
Maudslay Motor Co.—Coventry, Eng.
Maxwell & Fitch Co.—218 S. Washington St., Rome, N. Y.
McCaill-Brainerd Engine Co.—390 Webster Ave., Long Island City, N. Y.
Moline Pump Co.—Moline, Ill.
Mechanical Electrical Construction Co.—Philadelphia, Pa.
Milwaukee Motor Co.—Ave, Milwaukee, Wis.
Morton Marine Motor Co.—7 Milton Sts., Camden, N. J.
Motor Car Power Equipment—577 Grove St., Milwaukee, W.
Munch, J.—18 rue Rottamhu, France.
Murray & Tregurtha (—St., Boston, Mass.

MOTORS—MARINE, GASOLENE
(Continued)

Mutel et Cie.—124 rue St. Charles, Paris, France.
Nagant Frères.—44 quai Coronmeuse, Liege, Belgium.
Napier Motorcar Co.—Acton Vale, London, England.
New Engine Co.—Acton, London W., England.
New London Motor Co.—New London, Conn.
Noank Motor Works.—Noank Conn.
North Chicago Machine Co.—North Chicago, Ill.
Notting & Son.—Prospect, Ohio.
Oswald Motor Co.—Goshen, Ind.
Otto Gas Engine Works.—33d and Walnut Sts., Philadelphia, Pa.
Page Engineering Co.—Baltimore, Md.
Palmer Bros.—Coscob, Conn.
Panhard et Levassor, Société Anonym des Anciens, Etablissements.—19 ave. d'Ivry, Paris, France.
Parker Co., J. J.—506 Erie St., Fulton, N. Y.
Peninsular Motor Co.—Grand Rapids, Mich.
Peugeot, A., Tony Huber et Cie.—56 rue du Vieux-Pont-de-Sevres, Billancourt, France.
Phillips Motor Works, W. L.—405 Tacoma Bldg., La Salle and Madison Sts., Chicago, Ill.
Piggins Bros.—Racine, Wis.
Potter Mfg. Co.—New Brunswick, N. J.
Puritan Machine Co.—12-16 Gratiot Ave., Detroit, Mich.
Putnam Motor Mfg. Co.—57 Lebanon St., Springfield, Mass.
Racine Boat Mfg. Co.—Muskegon, Mich.
Rathburn-Lacy Co.—Toledo, Ohio.
Red Wing Boat Mfg. Co.—Red Wing, Minn.
Regal Gasoline Engine Co.—Coldwater, Mich.
Rex Motor Co.—69 Woodward Ave., Detroit, Mich.
Rice & Co., John V., Jr.—Bordentown, N. J.
Rochester Gas Engine Co.—705 Driving Park Ave., Rochester, N. Y.
Safford Mfg. Co., W. E.—Westerly, R. I.
Saginaw Yacht & Mill—Saginaw, Mich.
————Lubien St.,
————toit, Mich.
sky Foundry & Machine Co.—San-
 cy, Ohio.
Engine Co., S.—South Norwalk,
 in.
user Mfg. Co.—151 E. 126th St.,
 v York City.
Co., F. A.—141 Frelinghuysen Ave.,
 wark, N. J.

MOTORS—MARINE, GASOLENE
(Continued)

Sintz-Wallin Co., The.—285 S. Front St., Grand Rapids, Mich.
Smalley Motor Co., Ltd.—Bay City, Mich.
Sparks Machine Co., C. F.—Alton, Ill.
Spaulding Engine Co.—St. Joseph, Mich.
Standard Motor Construction Co.—180 Whiton St., Jersey City, N. J.
Sterling Engine Co.—Fall River, Mass.
Sterling Engine Co.—119-121 Grant St., Buffalo, N. Y.
Stork Motor Co.—Saginaw, Mich.
Stover Motor Car Co.—Freeport, Ill.
Temple Pump Co., The.—15th St. & 15th Pl., near Canal St., Chicago, Ill.
Termaat & Monahan Co.—Oshkosh, Wis.
Thousand Island Boat & Engine Co.—Morristown, N. J.
Tocanier et Cie, A.—27 Corso Genova, Milan, Italy.
Torrey Roller Bushing Co.—Bath, Me.
Trebert Gas Engine Co.—35-37 Ford St., Rochester, N. Y.
Truscott Boat Mfg. Co.—St. Joseph, Mich.
Tuttle Co., D. M.—Canastota, N. Y.
Underberg et Cie, E.—rue de Coulmiers, Nantes, France.
United Mfg. Co.—175 Woodbridge St., Detroit, Mich.
Usines de Saventhem.—Saventhem-lez-Bruxelles, Belgium.
Vim Motor Co., The.—Sandusky, Ohio.
Virtue & Pound Mfg. Co.—Owatanna, Minn.
Waterman Marine Motor Co.—1506-12 Fort St., W., Detroit, Mich.
Watertown Motor Co.—40 Moulton St., Watertown, N. Y.
Watkins Co., Frank M., The.—525-31 Baymiller St., Cincinnati, O.
Waukesha Motor Co.—110 North St., Waukesha, Wis.
Willet Engine & Carbureter Co.—764 Ellicott Sq., Buffalo, N. Y.
Wenzel, Gustav.—Niedersedlitz, Dresden, Germany.
Western Auto Supply Co.—285 Virginia St., Milwaukee, Wis.
Western Launch & Engine Works.—Michigan City, Ind.
Western Motor Co.—Logansport, Ind.
Wiener, L.—Zwolla, Holland.
Wilford et fils.—Tamise, Belgium.
Willink, Gebrüder.—12 Paleistraase, Amsterdam, Holland.
Wolf unt Struck.—Vaals, Holland.
Wolseley Tool and Motorcar Co.—Birmingham, England.
Wolverine Motor Works.—Grand Rapids, Mich.

MOTORCYCLE MFRS.

Adler Fahrradwerke Vorm Heinrich Kleyer.—Frankfort-am-Main, Germany.

American Motor Co.—Brockton, Mass.

Antoine fils et Cie.—41 quai St. Leonard, Liège, Belgium.

Antony Motor & Mfg. Co.—Colorado Springs, Colo.

Armac Motor Co.—472-78 Carroll Ave., Chicago, Ill.

Arms de Guerre.—Fabrique Nationale d', Herstael-ls-Liege, Belgium.

Arentsen und Kölling.—Dieren, Holland.

Ariel Works.—Bournebrook, Birmingham, England.

Aurora Automatic Machinery Co.—Aurora, Ill.

Austria Motorenwerke, Ignaz & Josef Mezera.—Vienna, Austria.

Baakmann, Johannes.—Assen, Holland.

Balmer, U.—Moutier, Jura-Bernois, Switzerland.

Bara, Pascault et Riga.—35 rue Victor Mace, Paris, France.

Bat Motor Mfg. Co.—Penge, London, S. E., England.

Bayard, Ch.—80 rue Voie-de-Liege, Herstal, Belgium.

Bercley Cycle & Motor Works.—171 ave. de la Reine, Brussels, Belgium.

Benard Crespin.—St.Branchs, Indre-et-Loire, France.

Bielefelder Naemaschinen und Fahrradwerke.—Bielefeld, Germany.

Bilgeri Wurzer und Co.—Helioswerke, Bregenz, Laiblach, Austria.

Bird & Co., W. Hobart.—Coventry, England.

Bismark Fahrradwerke Gesellschaft.—Bergerhof, Rheinisch-Preussen, Germany.

Boissette, Emile.—260 bvd. Voltaire, Paris, France.

Bonnardi, Luigi.—via Piazzi, 3 Crocetta, Turin, Italy.

Bonnet et Zecht.—14 rue de la Vega, Paris, France.

Bourdeaux, L.—16 ave Grammont, Tours, France.

Bradbury & Co., Ltd.—Wellington Works, Oldham, England.

Bradford Motor Co.—Bradford, Pa.

Bradley Motor Co., C. E.—268 Diamond St., Philadelphia, Pa.

Braunschweiger Fahrradwerke.—Brunswick, Germany.

Brown & Beck.—Denver, Colo.

Brown Bros., Ltd.—Great Eastern St., London, England.

Bruneau et Cie.—12 rue Victor Hugo, Tours, France.

Buckeye Motor Co.—201 S. High St., Columbus, Ohio.

MOTORCYCLE MFRS. (Continued)

Ruegg Frères.—Riedickon, Uster, Switzerland.

Capra, M.—7 ave de Taillebourg, Paris, France.

Chantemedé.—47 ave de la Republique, Paris, France.

Chater Lea, Ltd.—114 Golden Lane, London, E. C., England.

Chazalnoel, Etienne.—Tarnac, Coreze, France.

Christiansen, Hermann-Carl.—63 St. Konensgade, Copenhagen, Denmark.

Clement et Gladiador, Société Française des Cycles.—Pre-St.-Gervais, Paris, France.

Cless und Plessing.—36 Grazergasse, Graz, Styria, Austria.

Compagnie de Constructions Mécaniques.—80 rue Jean Breydel, Anvers, Belgium.

Consolidated Mfg. Co.—Toledo, Ohio.

Coppa fratelli.—3 piazzale Genova, Milan, Italy.

Corona Fahrradwerke und Metallindustrie, Actien Gesellschaft.—Brandenburg, Germany.

Cottreau, Etablissements.—Lentillieres, Dijon, France.

Crespo, Herman.—27 Arenal, Madrid, Spain.

Crouch Motor Co.—Stoneham, Mass.

Cudell und Co.—46 Reinickendorferstrasse, Berlin, Germany.

Curtiss Mfg. Co., G. H.—Hammondsport, N. Y.

Cyclos Zarbref.—3 calle de las Carratral, Barbastro, Spain.

David et Cie.—16 rue Oberkampf, Paris, France.

David et Cie.—Geneva, Switzerland.

de la Chapelle Frères et Cie.—St. Chamond, Loire, France.

Demeester.—22 ave. de la Grande Armée, Paris, France.

Derozier, A.—Nemours, Seine-et-Marne, France.

Deutsche Triumph Fahrradwerke Actien Gesellschaft.—Doos-Nurnberg, Germany.

Diamant Fahrradwerke.—Reichenbrand, Saxony, Germany.

Driver, Walter.—700 W. Lehigh Ave., Philadelphia, Pa.

Dufaux et Cie., H. & A.—Geneva, Switzerland.

Dusenber, A. S.—Garner, Iowa.

Dutemple, A.—33 rue de Seine, Ivry-Port, France.

Eclipse Machine Company.—Elmira, N. Y.

Eerste Amsterdamsche Bandenwielen & Motorrijwielen, Salriek.—27 Helmerstrasse, Amsterdam, Holland.

Eerste Nederlandsche Rijwielfabriek.—Deventer, Holland.

Enfield Cycle Co.—Redditch, England.

MOTORCYCLE MFRS. (Continued)

- Excelsior Fahrradwerke Actien Gesellschaft.**—Brandenburg, Germany.
Excelsior Motor & Mfg. Co.—233-7 Randolph St., Chicago, Ill.
Express Fahrradwerke Actien Gesellschaft.—Neumarkt, Nürnberg, Germany.
Fowler Manson-Sherman Cycle Mfg. Co.—45-47 Fulton St., Chicago, Ill.
Fournier, Edouard.—67 rue de Chabrol, Paris, France.
Frederiksen, Herman-Carl.—39 Roskildevej, Copenhagen, Denmark.
Frera, Societe Anonima.—33 Via Carlo Alberto, Milan, Italy.
Gaud Frères.—Juvisy, Seine-et-Oise, France.
Geir Co., Harry R.—St. Louis, Mo.
Gentil et Cie.—4 bvd. Bourdon, Neuilly, France.
Gerkinet, Josef.—rue Hayeneux, Herstal, Belgium.
Gillet et Cie, Réne.—10 villa Collet, Paris, France.
Goyon, H.—65 ave de la Bourdonnais, Paris, France.
Great Western Mfg. Co.—La Porte, Ind.
Grosmanjin, Ch.—11 rue Boubillot, Paris, France.
Guerry et Bourguignon.—116 bvd. de Grenelle, Paris, France.
Haarlemsche Automobielen en Motoorwielafabriek.—Zotte Straase, Haarlem, Holland.
Harley-Davidson Motor Co.—315 39th St., Milwaukee, Wis.
Heine und Wegelin.—Oberhausen, Germany.
Hendee Mfg. Co.—Springfield, Mass.
Herdtlé et Bruneau.—48 bis, rue de la Chine, Paris, France.
Hoffman Launch & Motor Works.—1253 N. Halsted St., Chicago, Ill.
Hornecker Motor Mfg. Co.—Whiting, Ind.
Hudson Mfg. Co.—Hudson, Mich.
Huneurbein frères.—102 rue d'ensival, Verviers, Belgium.
Humber and Co.—Copenhagen, Denmark.
Humber, Ltd.—Beeston, England.
Illinois Motor Works.—719-23 Sheffield Ave., Chicago, Ill.
Jacquot, Georges.—30 rue de Prieze, Troyes, France.
Jos Söhne und Co.—51 Schwanthalerstrasse, Munich, Germany.
Jubisch, Carl.—12 Weststrasse, Schoenefeld, Leipzig, Germany.
eller, Dorian A.—89 bis rue Dauphiné, Lyon, France.
Knapp et Cie, Georgia.—90 rue de Prieze, Troyes, France.
Knudsen, Carl-Frederik-Albert.—Kongensgade, Odense, Denmark.

MOTORCYCLE MFRS. (Continued)

- Kohout und Co.**—40 Warwastrasse, Brunn, Moravia, Austria.
Köln-Lindenthaler Metallwerke Aktien Gesellschaft.—Kriel-Köln, Germany.
Kometwerke Actiengesellschaft.—Dresden, Germany.
Laforez.—155 ave. de Neuilly, Neuilly sur Seine, France.
Laurin und Klement, Slavia-Fahrradwerke.—Jungbuntzlau, Bohemia, Austria.
Leader Automobile Co., The.—2442 Lisbon Ave., Milwaukee, Wis.
Light Motors, Ltd.—180 Grays Inn Rd., London, W., England.
Linon, L.—Ensival-lez-Verviers, Belgium.
Lloyd Motor & Engineering Co.—132 Monument Road, Birmingham, England.
London Auto Co.—Clapham Road, London, S. W., England.
Lotteau frères.—16 rue du Pont, Choisy-le-Roi, Paris, France.
Loubier.—9 cours Lieutaud, Marseille, France.
Lux, Fabbrica di Automobili e cicli.—2 corso Valentino, Milan, Italy.
Machine Rijwiel en Automobielenfabriek Simplex.—Overtoun 85, Amsterdam, Holland.
Macquart et fils et Cie.—route de Corbeil, Montgeron, Seine-et-Oise, France.
Mantovani, Carlo.—88 via Saluzzo, Turin, Italy.
Manufacture Française d'Armes et cycles de Saint Etienne.—St. Etienne, Loire, France.
Manufacture Suisse de Velocipedes.—Courfaivre, Switzerland.
Marchand-Dufaux, Fabbrica Italiana Si Vetture Automobile.—Plaisance, Italy.
Mars Fahrradwerke Actiengesellschaft.—Doss-Nurnberg, Germany.
Maseti e Fontana.—7 via San Stefano, Reggio-Emilia, Italy.
Mayo Dampier Co.—255 Walnut St., Pottstown, Pa.
McLaughlin, J. F.—148 E. 49th St., New York City.
Meadowbrook Cycle Co.—137-141 Jackson St., Hempstead, L. I., N. Y.
Merkel Motor Co.—Milwaukee, Wis.
Metallindustrie Schönbeck Actiengesellschaft.—Schönbeck, Germany.
Metz, C. H.—Waltham, Mass.
Miami Cycle & Mfg. Co.—Grand Ave., Middletown, Ohio.
Mindener Maschinen und Fahrradwerke.—Minden, Westphalia, Germany.
Minutoli, Millo e Cia.—15 via Giglio, Lucca, Italy.
Mitchell Motor Car Co.—Racine, Wis.
Minerva Motors, Ltd.—Berchem, Antwerp, Belgium.
Mom, Ateliers de Constructions Mécaniques.—173 bvd. Péreire, Paris, France.

MOTORCYCLE MFRS. (Continued)

Motte & Co., D.—25 rue de Courcelles, Levallois, France.
Motocyclette Griffon.—40 rue Louis-Blanc, Courbevoie, France.
Motorcycle Equipment & Supply Co.—4 Lake St., Hammondsport, N. Y.
Motorenfabrik Magnet.—Berlin-Weissensee, Germany.
Naris-Chiorda.—Via umberto primo, Albino, Italy.
Neckarsulmer Fahrradwerke Actiengesellschaft.—Neckarsulm, Württemberg, Germany.
Norton Mfg. Co.—Deritend Bridge, Floodgate St., Birmingham, England.
Nurnberger Herkules werke Actiengesellschaft.—Nurnberg, Germany.
Opel, Adam.—Russelsheim am Main, Germany.
Ovington Mfg. Co.—2382 Broadway, New York City.
Phanomen Fahrradwerke, Gustav Hiller.—Zittau, Germany.
Panther Fahrradwerke, Oscar Vormbaum.—Madgeburg, Germany.
Pasquet.—ave. Michelet, Salon, Bouchedu-Rhone, France.
Pedraglio fratelli.—28 via Milano, Como, Italy.
Peugeot Frères.—les Fils de-Valentigny, Doubs, France.
Phelon & Moore.—Cleckheaton, England.
Phillips & Hamilton.—Bradford, Pa.
Phoenix Motors, Ltd.—Blundell St., Caledonian Road, London, N., England.
Pioneer Motor Cycle Co.—290 Grove St., Jersey City, N. J.
Pope Mfg. Co.—Hartford, Conn.
Pottelet et Preudhomme.—33 rue Jules, Van-Praet, Brussels, Belgium.
Premier Cycle Co.—Nürnberg, Germany.
Prestowerke, Günther und Co.—Zwick-austrasse, Chemnitz, Germany.
Prestwich & Co., J. A.—1 Lansdowne Road, Tottenham, London, England.
Progress Cycle Co., Ltd.—Bishopsgate Green, Coventry, England.
Progress Motoren. und. Apparatenbau Gesellschaft.—39 Wilmersdorferstrasse, Charlattenberg, Germany.
Prospect Motor Mfg. Co.—7-9 Park Pl., Brooklyn, N. Y.
Racouard-Rocher.—26 rue National, Chateaux-du-Loire, Sarthe, France.
Radiguet, G.—97 ave. d'Italie, Paris, France.
Raleigh Cycle Co., Ltd.—Nottingham, England.
Razoux, Chas. L.—446 Tremont St., Boston, Mass.
Reading Standard Cycle Mfg. Co.—Reading, Pa.

MOTORCYCLE MFRS. (Continued)

Reichenbach, Karl-Wilhelm.—Elsterwerde-Biehla, Saxony, Germany.
Reliance Motor Cycle Co.—Addison, N. Y.
Restelli.—15 a, via Disciplini, Milan, Italy.
Rex Motor Mfg. Co.—Coventry, England.
Riesner, Josef.—6 Schmalzhofg, Vienna, Austria.
Rijwielenfabriek Gruno.—Winschoten, Holland.
Roessler und Jauernig.—Aussig-sur-Elbe, Austria.
Rover Cycle Co., Ltd.—Coventry, England.
Royal Motor Works.—30 Russell St., Worcester, Mass.
Sacripanti, G.—38 via Vincenzo, Rome, Italy.
Sanroma, Alfonso.—238 calle Aragon, Barcelona, Spain.
Sarolea, Maison.—269 rue St. Lambert, Herstal, Belgium.
Saule e Pusterla.—41 via Lecco, Como, Italy.
Schild et Cie, B.—Bienne, Madretsch, Switzerland.
Schröder und Co., H.—Berlin, N. W., Germany.
Service Co., Ltd.—292 High Holborn, London, W. C., England.
Siddard, Wm. A.—10 Bellevue Ave., Philadelphia, Pa.
Simonon, Fonderies et Ateliers.—Herstal, Belgium.
Singer Co., Ltd.—Coventry, England.
Société de Constructions Mécaniques de la Loire.—Chemin du Rez, St. Étienne, France.
Société Industrielle d'Albert.—27 ave. de la Grande Armée, Paris, France.
Société "la Française."—11 rue Brunel, Paris, France.
South British Trading Co., Ltd.—15 Wilson St., Finsbury, London, E. C., England.
Steffey Mfg. Co.—2722 Brown St., Philadelphia, Pa.
Storero, Luigi.—28 corso Massino d'Azeglio, Turin, Italy.
Styria Farradwerke, Jos. Buch und Co.—Graz, Austria.
Suddard, Wm. A.—10 Bellevue Ave., Providence, R. I.
Suère.—73 rue Claude, France.
Swager.—Utrecht, H
Syndicat des Brevets Virat—du Surmelin, Paris, France
Terrot et Cie.—Dijon, France
Teudeloff Halloria Motorfa—Halle-am-Saal, Germany.
Thomas Auto-Bi Co.—1443 Nia Buffalo, N. Y.

MOTORCYCLE MFRS. (Continued)

- Thuringische Maschinen und Fahrradfabrik.**—Mülhausen, Thuringia, Germany.
Tragin, E.—15 rue Montalivet, Paris, France.
Triumph Cycle Co., Ltd.—Coventry, England.
Turckheimer.—4 via Lambro, Milan, Italy.
Twining Auto Co.—218 N. Broad St., Philadelphia, Pa.
Vandervelde.—36 rue des foulons, Gand, Belgium.
Van Nieuwenhoven und de Clerq.—376 rue Longue-d'Argile, Anvers, Belgium.
Velofabrik Liesthal.—Liesthal, Switzerland.
Victoriawerke Actiengesellschaft.—Nürnberg, Germany.
Volker und Prugel.—Obernberg am Main, Germany.
Wacheux.—84 rue de 4 Coins, Calais, France.
Wafflard, A.—19 rue Bois, Gotha, Liege, Belgium.
Wagner Motor Cycle Co.—327 S. Peter St., St. Paul, Minn.
Wall, A. W., Ltd.—Birmingham, England.
Waltham Mfg. Co.—Waltham, Mass.
Wanderer Fahrradwerke.—Schönau bei Chemnitz, Germany.
Warwick Cycle & Auto Co.—Springfield, Mass.
Widmayer, F. B.—2312 Broadway, New York City.
Zenith Motor Engineering Co.—101 Stroud Green Road, Finsbury Park, London, England.
Zucker, Ph.—17 Clarastrasse, Bale, Switzerland.
Zuntini, Romeo.—Gaiba, Italy.

MOTOR MFRS. MOTORCYCLE.

- Ariel Motors, Ltd.**—101 New Bond St., London W., England.
Aktiebolaget Davy Robertsons Maskinfabrik Guldbrasen & Son.—Goleborb, Sweden.
Allez frères.—2 rue Adolph-Adam, Paris, France.
Aprile, Rossi et Cie.—3 via Luitpraudo, Paris, France.

L.—St. Denis, France.
chinery Co.—Auro-

et Ravel.—Ave de
ent, Besançon, France.
Motorfahrzeugfabrik.—
lderstrasse, Berlin, Ger-

lges de Construction d'Auto-
mobile (Société Anonyme).—10 rue
sdael, Brussels, Belgium.

MOTOR MFRS. MOTORCYCLE
(Continued)

- Compagnie de Constructions Mécaniques (Société Anonyme).**—80 rue Jan Breydel, Berchem-Anvers, Belgium.
Cottureau Etablissements.—Lintillieres, Dijon, France.
Cudellund Co.—46 Ruckerdorferstrasse, Berlin, Germany.
Dalifal et Cie.—40 blvd. d'Asnieres (Ile-de-la-Jatte), Neuilly, France.
David et Cie, J.—Geneva-Acacias, Switzerland.
De Dion, Bouton et Cie.—quai National Puteaux, France.
Dufaux et Cie, H. A.—Geneva, Switzerland.
East London Rubber Co.—211 Shore-ditch, London, England.
Gillet et Cie, Réne.—10 villa Collet, rue Didot, Paris, France.
Light Motors, Ltd.—180 Gray's Inn Rd., London W. C., England.
Marchand-Dufaux, Fabbrica Italiana di Vettura Automobile.—Plaisance, Mark Frères.—rue Hoyoux, Herstal, Belgium.
Motorenfabrik Magnet.—Weissensee, Berlin, Germany.
Neckarsulmer Fahrradwerke Actiengesellschaft.—Neckarsulm, Württemberg, Germany.
Peugeot, A., Tony Huber et Cie.—56 rue du Vieux-Pont-de-Sevres, Billancourt, Paris, France.
Prestwich, John A.—1 Lansdowne Rd., Tottenham, London N., England.
Putnam Motor Mfg. Co.—57 Lebanon St., Springfield, Mass.
Rosselli.—29 via Nizza, Turin, Italy.
Sarolea, Maison.—269 rue St. Lambert, Herstal, Belgium.
Simms Mfg. Co., Ltd.—Kimberley Rd., Kilburn, London, England.
Stevens Motor Mfg. Co.—Wolverhampton, England.
Suere.—73 rue Claude-Decaen, Paris, France.
Taddeoli, E.—25 rue de l'Arquebuse, Geneva, Switzerland.
Vermorel, V.—Villefranche (Rhône), France.
White & Poppe, Ltd.—Coventry, England.

MUFFLERS.

- Auto & Power Appliance Co.**—The Arcade, Cleveland, O.
A. Z. Co., The.—527 W. 56th St., New York City.
Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Byrne, Kingston Co.—339-351 Smith St., Kokomo, Ind.
Champion Mfg. Co.—9-15 Alling St., Newark, N. J.
Gray-Hawley Mfg. Co.—605-609 W. Fort St., Detroit, Mich.

MUFFLERS (Continued)

- Hammar Mfg. Co., H.**—170 E. Madison St., Chicago, Ill.
Hayes Mfg. Co.—360-370 Maybury Ave., Detroit, Mich.
Hayney, Geo. F.—Lynn, Mass.
Kells, Mfg. Co., W. J.—Jersey City, N. J.
Kinsey Mfg. Co.—Dayton, O.
Knoblock-Heideman Mfg. Co.—South Bend, Ind.
Loomis Auto Car Co.—Westfield, Mass.
Milwaukee Motor Co.—615 Clyborn Ave., Milwaukee, Wis.
Motor & Mfg. Works.—Geneva, N. Y.
Motsinger Device Mfg. Co.—36 Main St., Pendleton, Ind.
Powell Muffler & Timer Co.—42 Lafayette St., Utica, N. Y.
Rockford Automobile & Engine Co.—Rockford, Ill.
Ross, H. S.—5607 S. Halsted St., Chicago, Ill.
Smith & Co., D. B.—Utica, N. Y.
Snow, B. W.—132 Bissell St., Syracuse, N. Y.
Turner Brass Works (The).—72 Michigan St., Chicago, Ill. Factory at Sycamore.
Walter & Sons, N. C.—194 William St., New York City.
Weeber Mfg. Works., C. F.—170-172 Central Ave., Albany, N. Y.
Westerfield Motor Co. (The).—1525 S. Main St., Anderson, Ind.
Yankee Muffler Co., The.—Utica, N. Y.

NAILS—UPHOLSTERING

- New Haven Button Co.**—New Haven, Conn.
Roehm & Davison, Ltd.—91-95 W. Woodbridge St., Detroit, Mich.

NIPPLES.

- Breeze Carburetter Co. of New York.**—101 W. 66th St., New York City.
Codman & Shurtleff, Inc.—120 Boylston St., Boston, Mass.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Hatcher Auto Parts Co.—2108 Superior Ave., Cleveland, O.
Jamesville Mfg. Co.—Jamesville, N. Y.
Judd & Leland Mfg. Co.—Hibbard Ave., Clifton Springs, N. Y.
Park City Brass Co.—Springfield, Mass.
Parker, E. N.—Springfield, Mass.
Shrimpton Mfg. Co.—Church St., New York City.
Standard Co.—Torrington, Conn.
Stevens & Co.—99 Chambers St., New York City.
Tiley-Pratt Co., The.—Essex, Conn.
Toledo Metal Wheel Co.—163 W. Main St., Rochester, N. Y.
Utica Drop Forge & Tool Co.—75 Genesee St., Utica, N. Y.

NON-SKIDS.

- Adwear Auto Tire Sleeve Co.**—High and Washington Sts., North Attleboro, Mass.
Akron Pneumatic Tire & Protector Co.—Akron, O.
American Tire Co.—Owosso, Mich.
Antiderapatant Rittier.—167 bis, rue de Courcelles, Levallois-Perret, France.
Avon India Rubber Co., Ltd.—Melksham (Wiltshire), England.
Babert et Cie, Louis.—12 rue des Jacobins, Fontenay-et-Comte (Vendee), France.
Bardon, Clérc et Cie.—12 blvd. Sebastopol, Paris, France.
Barthelat, P.—6 rue de Corneille, Lavollois (Seine), France.
Beau et Cie, C.—171 cours Lafayette, Lyon, France.
Beaujon.—9 rue de Chaillot, Paris, France.
Bezault, R.—16 blvd. de Villiers, Levallois (Seine), France.
Bergougnan et Cie. (Société Générale des Etablissements).—Clermont-Ferrand. (Puy-de-Dome), France.
Bouvier fils.—51 rue du Tunnel, Valence (Drôme), France.
Brooks & Co., Ltd., J. B.—Great Charles St., Birmingham, England.
Brown Mfg. & Garage Co., J. C.—Butler, Ind.
Buchillet et Cie, P.—47 rue St. Ferdinand, Paris, France.
Chameroy, E. et A.—route de Sartrouville. Vesinet (Seine-et-Oise), France.
Chavand et Cie.—119 rue Sébastien-Gryphe, Lyon, France.
Continental Caoutchouc & Guttapercha Co.—Hanover, Germany.
Curé, Raoul, E. Gasse et Cie.—Darnetal. Pres Rouen (Nievre), France.
Darcy Tire Guard Co.—399 Franklin St., Buffalo, N. Y.
De Fornier.—7 ave de la Capelette, Marseilles, France.
Désclée et Cie, G.—171 ave de la Reine, Brussels, Belgium.
Désclée et Cie, J.—159 ave. Malakoff, Paris, France.
Deutsche Samson-Leder-Pneumatik Gesellschaft.—Mittelstrasse 46, Berlin, Germany.
Dufour Jeune et fils.—22 rue de la Cerisaie, Charenton, France.
Dutriex-Lamelin.—Lesquesnoy (Nord), France.
Edward's Non-Skid Syndicate.—Queen Anne's Chambers, Westminster, London S. W., England.
Empire State Tire Co.—Buffalo, N. Y.
Englebert fils et Cie, O.—29 rue des Vennes, Liège, Belgium.
Eyre & Co.—Grosvenor Gardens, St. Leonards (Sussex), England.

NON-SKIDS (Continued)

Feld, Carl.—Wald (Rheinland), Germany.
Fessoirat, E.—5 rue des Marais, Versailles, France.
Filogamo et cie, D.—24 via Mille, Turin, Italy.
Fortier-Beaulieu ..Jeune. — Roanne, France.
Glasgow Motor Tyre Co.—71 Waterloo St., Glasgow, Scotland.
Grose, Ltd.—Northampton, England.
Healy Leather Tire Co.—90 Gold St., New York City.
Heucken Sohne und Co.—Aix-la-Chapelle, Germany.
Houben, Theodore.—Verviers, Belgium.
Inner Shoe Tire Co.—64 Monroe St., Grand Rapids, Mich.
Iver Johnson Sporting Goods Co.—163-165 Washington St., Boston, Mass.
Jeannerot et Perrin.—27 rue de Vendome, Lyon, France.
Jenatry-Leleux (Manufacture Générale de Caoutchouc).—10 rue Stephenson, Brussels, Belgium.
"La Durandal."—11 blvd. de Strasbourg, Paris, France.
Leather Tire Goods Co.—1325 Boylston St., Newton Upper Falls, Mass.
"Le Centaure," Société Anonyme.—208 cours Gambetta, Lyon, France.
Lecerf.—17 faubourg de Paris, Peronne (Somme), France.
Lees Patent Spiral Thread Co.—3 Pall Mall, Manchester, England.
Lins Pneumatik Co.—Schönebeck-am-Elbe, Germany.
London Scottish Rubber Co.—162 Clerk-enweil Rd., London E. C., England.
Martin Evans Co.—1186 Bedford Ave., Brooklyn, N. Y.
Ménégaut-Basset, G.—35 ave Laplace, Arcueil (Seine), France.
Middlemore & Lamplugh, Ltd.—Holloway Head, Birmingham, England.
Néron, Société de l'Antidérapant.—38 ter, rue de Paris, Elberof, France.
Pecaud, H.—66 rue du Bois, Levallois (Seine), France.
Parsons Non-Skid Co., Ltd.—210 Shaftesbury Ave., London W. C., England.
Plagaven, Ch., et Cie.—St. Antonin (Tarn et Garonne), France.
Pneu-Hérault.—120 blvd. Magenta, Paris, France.
Poisat et Cie.—6 rue de la Linière, Brussels, Belgium.
Pullman, R. & J., Ltd.—Westbrook Mills, Godalming (Surrey), England.
Renaudin, H.—36 rue Urbain 4, Troyes (Aube), France.
Republic Rubber Tire & Shoe Co. (The).—449 W. 53rd St., New York City.
Robert et Boisseau.—44 rue du Bois, Levallois (Seine), France.

NON-SKIDS (Continued)

Roberts Non-Skid Motor Tyre Co.—Gripwell works, St. Mary's row, Birmingham, England.
Rogers-Durand.—99 blvd. Beaumarchais, Paris, France.
Sager Co., J. H.—Rochester, N. Y.
Sampson Leather Tire Co.—1634-1642 Broadway, New York City.
Sawyer & Co.—Banister Rd., Kensal Rise, London W., England.
S. C. Fabric Tire Tread Co.—1900 Broadway, New York City.
Shaw Motor Tyre Tread Co.—135 Steel-house Lane, Birmingham, England.
Siewerdt Loewen.—Elberfeld, Germany.
Slama Tire Protector Co.—Humboldt, Neb.
Société de l'Antidérapant "Le Bayard."—56 rue de la Roquette, Paris, France.
Staub und Co.—Mannedorf, Switzerland.
Sunbury Mfg. Co.—Sunbury, O.
Truchet.—11 rue du Léman, Geneva, Switzerland.
Vadon, C.—17 rue du Musée, Lyon, France.
Vereinigte Dürerer Treibriemenfabriken.—Düren, Germany.
Wallwork & Co., Ltd., Henry.—Rogers St., Manchester, England.
Weed Chain Tire Grip Co.—28 Moore St., New York City.

NUMBERS—LICENSE

Aluminum Mfg. Co.—Two Rivers, Wis.
Baltimore Enamel & Novelty Co.—Ft. of Allen St., Baltimore, Md.
Balzer, Gus.—1556 Broadway, New York City.
Boyle & Co., John.—112-114 Duane St., New York City.
Chandler & Co., The.—31 Taylor St., Springfield, Mass.
Childs & Co., S. D.—200 S. Clark St., Chicago, Ill.
Fine, Horace E.—19 E. State St., Trenton, N. J.
Greacen & Co., Walter.—12 Mechanic St., Newark, N. J.
McKinnon Dash Co.—Buffalo, N. Y.
Monogram Crest & Sign Co.—125 E. 86th St., New York City.
Morse, C. H. & Son.—13 S. Water St., Rochester, N. Y.
Murdock, Jr., Co., James.—116 Opera Pl., Cincinnati, O.
New Jersey Aluminum Co.—19th and Springfield Aves., Newark, N. J.
Noonan Tool & Machine Works.—Rome, N. Y.
Rees, F. H.—Steel Memorial Bldg., Elmira, N. Y.
Robbins Mfg. Co., John.—58 Kneeland St., Boston, Mass.
Stafford Co., N.—67 Fulton St., New York City.

NUTS.

American Iron & Steel Mfg. Co.—Lebanon, Pa.
Atlas Bolt & Screw Co., The.—Cleveland, O.
Buffalo Bolt Co.—East Ave. and Oliver St., Tonawanda, N. Y.
Chicago Screw Co.—2 N. Canal St., Chicago, Ill.
Clark Bros Bolt Co.—Milldale, Conn.
Columbus Bolt Works.—162 W. Randolph St., Columbus, O.
Corbin Screw Corp., The.—New Britain, Conn.
Detroit Screw Works.—Riopelle and Franklin Sts., Detroit, Mich.
Eclipse Machine Co.—Elmira, N. Y.
Fluke, F. S.—6036 Woodlawn Ave., Chicago, Ill.
Franklin Moore Co.—Winsted, Conn.
Galvanizing Co., The.—525 N. Front St., Philadelphia, Pa.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Kirk-Latty Co.—Cleveland, O.
Lamson & Sessions Co.—412-453 Scranton Ave., Cleveland, O.
National Sewing Machine Co.—Belvidere, Ill.
National Screw & Tack Co.—Cleveland, O.
Peninsular Milled Screw Co.—751 Bellevue Ave., Detroit, Mich.
Republic Iron & Steel Co.—Stock Exchange Bldg., Chicago, Ill.
Russell, Burdsall & Ward Bolt & Nut Co.—Port Chester, N. Y.
Union Steel Screw Co.—Cleveland, O.
Upson Bolt & Nut Co.—Cleveland, O.
Western Automatic Machine Screw Co. The.—Elyria, O.
Worcester Machine Screw Co.—Worcester, Mass.

NUTS—LOCK

Allison Mfg. Co.—Philadelphia, Pa.
Columbia Nut & Bolt Co.—1500 Railroad Ave., Bridgeport, Conn.
Cumberland Steel Co.—Williams St. and B. & O. R. R., Cumberland, Md.
Eureka Nut Lock Co.—32nd and Smallman Sts., Pittsburg, Pa.
Grip Nut Co.—152 Lake St., Chicago, Ill., and 500 5th Ave., New York City.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
"It" Locknut Concern.—515 E. 63rd St., Chicago, Ill.
National Elastic Nut Co.—Milwaukee, Wis.
National Lock Washer Co.—65-69 Johnson St., Newark, N. J.
Peninsular Milled Screw Co.—751 Bellevue Ave., Detroit, Mich.
Positive Lock Washer Co.—Newark, N. J.

NUTS—LOCK (Continued)

Smith Improved Lock Nut Co.—Rockford, Ill.
Spiral Nut Lock Co.—432 E. 71st St., New York City.
Waterbury Mfg. Co.—Waterbury, Conn.

ODOMETERS, see INDICATORS, MILEAGE

OILS.

Acme Oil & Supply Co.—345 S. Canal St., Chicago, Ill.
Alexander & Co., H. T.—17 State St., New York City.
American Oil Co.—170-178 S. Water St., Jackson, Mich.
Annis Oil Co., N. L.—139 Potomac Ave., Buffalo, N. Y.
Auto Oil Co.—Jackson, Mich.
Baum's Castorine Co.—104 W. George St., Rome, N. Y.
Besley & Co., C. H.—15-21 S. Clinton St., Chicago, Ill.
Borne-Scrymser Co.—Claremont, N. J.
Champion Oil Co.—39th St. and Lowe Ave., Chicago, Ill.
Chesterton & Co., A. W.—64 India St., Boston, Mass.
Childs Co., G. B., The.—499 Greenwich St., New York City.
Columbia Lubricants Co. of New York.—78 Broad St., New York City.
Curry Oil & Supply Co.—Boston, Mass.
Dearborn Drug & Chemical Works.—Chicago, Ill.
Dixon Crucible Co., Jos.—Jersey City, N. J.
Draper Co., Walter H.—120 S. Railroad Ave., Mt. Vernon, N. Y.
Eagle Oil & Supply Co.—104 Broad St., Boston, Mass.
Economy Oil & Compound Co.—442 Clark St., Chicago, Ill.
Emery Mfg. Co.—Bradford, Pa.
Fiske Bros. Refining Co.—13-15 Oldslip, New York City.
Galloway, G. W.—322 Pearl St., New York City.
Greenslade Oil Co.—23rd St. and M. C. Ry., Detroit, Mich.
Harrington Lubricant Co.—1691 Broadway, New York City.
Harris, A. W. Oil Co.—330 Water St., Providence, R. I.
Havemeyer Oil Co.—80 Brodway, N. Y.
Haws, George A.—New York City.
Hoffman Lubricating—hamton, N. Y.
Hosmer Co., G. A.—Ave., Buffalo, N. Y.
Kanter Co., J. R.—6 York City.
Kellogg & Co., E. H.—St., New York City.

OILS (Continued)

Kellom & Co., Chas. F.—128 Arch St., Philadelphia, Pa.
Keystone Supply Co.—Columbus, O.
Maclelan-Brandom Oil & Supply Co.—65 Long Wharf, Boston, Mass.
Magie Bros.—9-11 N. Canal St., Chicago, Ill.
Marion Mfg. Co.—Franklin, Pa.
Millers Sons, Wm. P.—73-79 3rd St., Long Island City, N. Y.
Monarch Mfg. Co.—Toledo, O.
Mound City Oil & Supply Co.—204 N. Commercial St., St. Louis, Mo.
National Oil & Supply Co.—Newark, N. J.
New York & New Jersey Lubricant Co.—14 and 16 Church St., New York City.
Northrop Lubricating Oil Co.—308 N. Commercial St., St. Louis, Mo.
Nye, Wm. F.—New Bedford, Mass.
Oil City Oil & Grease Co.—Oil City, Pa.
O-U-T-O Co.—19 Camfield St., Newark, N. J.
Paragon Refining Co., The.—Toledo, O.
Penn Oil & Supply Co.—Chicago, Ill.
Penn Petroleum Co.—117 N. 2nd St., Philadelphia, Pa.
Philadelphia Grease Mfg. Co.—The Bourse, Philadelphia, Pa.
Pigot, Sayre & Co.—135 William St., New York City.
Reliance Oil & Grease Co., The.—1501-1521 Columbus Rd., Cleveland, O.
Richardson Lubricating Co.—Quincy, Ill.
Robinson Sons & Co., Wm. C.—Baltimore, Md.
Royal Lub. Oil Co.—116 Broad St., New York City.
Sheppard, W. S.—22 Lawrence St., Newark, N. J.
Spear's Sons & Co., Alden, The.—369 Atlantic Ave., Boston, Mass.
Standard Oil Co.—26 Broadway, New York City.
Star Lubricating Co.—232 W. 28th St., New York City.
Sullivan Oil Co.—Chicago, Ill.
Swan & Finch Co.—151 Maiden Lane, New York City.
Charles F.—61 Market St., Hartford, Conn.
Oil Co.—Emlenton, Pa.
Oil Co.—275 Franklin St., Boston.
Oil Co.—Rochester, N. Y.
Oil Co.—H. R. and 152d St., New York City.
Oil Co.—21 River St., Chicago.
Oil Co.—Milwaukee, Wis.

OILS (Continued)

White & Bagley Co., The.—100 Foster St., Worcester, Mass.
Winn, Wm. R.—143 Maiden Lane, New York City.
Young, Orlando W.—180 Freylinghuyzen Ave., Newark, N. J.

OILS (SEMI-SOLID).

Auto Oil Co.—Jackson, Mich.
Borne-Scrymser Co.—Claremont, N. J.
Harris Oil Co., A. W.—330 Water St., Providence, R. I.
Kellom & Co., Chas. F.—128 Arch St., Philadelphia, Pa.
Millers Sons, Wm. P.—73-79 3rd St., Long Island City, N. Y.
Musliner & Co., Jos.—156 Maiden Lane, New York City.
New York & New Jersey Lubricant Co.—14 and 16 Church St., New York City.
Paragoin Refining Co., The.—Toledo, O.
Robinson Sons & Co., Wm. C.—Baltimore, Md.
Sheppard, W. S.—22 Lawrence St., Newark, N. J.
Standard Oil Co.—26 Broadway, New York City.

PACKING

American Steam Packing Co.—Boston, Mass.
Bickford & Francis Belting Co.—35 Pearl St., Buffalo, N. Y.
Booth, N. E.—743-47 39th St., Brooklyn, N. Y.
Boston Woven Hose & Rubber Co.—29 Hampshire St., Cambridge, Mass.
Buffalo Mill Supply Co.—210-12 Main St., Buffalo, N. Y.
Chesterton & Co., A. W.—64 India St., Boston, Mass.
Chicago Rawhide Mfg. Co.—75-77 Ohio St., Chicago, Ill.
Eagle Oil & Supply Co.—104 Broad St., Boston, Mass.
Garlock Packing Co., The.—534 Ellicott Sq., Buffalo, N. Y.
Gould Packing Co.—88 E. Cambridge St., Cambridge, Mass.
Greene, Tweed & Co.—17 Murray St., New York City.
Guillott Gasket Co., Wm.—1108 West Ave., Buffalo, N. Y.
Johns-Manville Co., H. W.—100 William St., New York City.
Keasby & Mattison Co.—Ambler, Pa.
Keasby, Robert A.—83 Warren St., New York City.
New Jersey Asbestos Co.—Camden, N. J.
New Jersey Car Spring & Rubber Co.—Wayne and Brunswick Sts., Jersey City, N. J.
Schrack & Co., C.—152 N. 4th St., Philadelphia, Pa.

PACKING (Continued)

Smooth-on Mfg. Co.—572 Communipaw Ave., Jersey City, N. J.
Winn, Wm. R.—143 Maiden Lane, New York City.

PAINTS

Acme White Lead & Color Works.—Detroit, Mich.
Adams & Elting Co.—155 W. Washington St., Chicago, Ill.
Becker Glass & Paint Co.—372-78 Pearl St., Buffalo, N. Y.
Berry Bros., Ltd.—Detroit, Mich.
Billings-Chapin Co., The.—Cleveland, O.
Century Mfg. Co.—272 W. Genesee St., Buffalo, N. Y.
Chase, Roberts & Co.—West Ave. and 5th St., Long Island City, N. Y.
Columbia Paint & Varnish Co.—12 Sanford St., Buffalo, N. Y.
Cooper Process Co.—506 White Bldg., Buffalo, N. Y.
Detroit White Lead Works.—5 Ohio St., Buffalo, N. Y.
Detroit White Lead Works.—532 Milwaukee Ave., Detroit, Mich.
Ditzler Paint & Color Co.—18 Baltimore Ave., West Detroit, Mich.
Felton Sibley & Co.—136-40 N. 4th St., Philadelphia, Pa.
Glidden Varnish Co.—Rockfellow Bldg., Cleveland, O.
Hefter, Jos.—15 Oak Grove Ave., Buffalo, N. Y.
Hildreth Varnish Co.—32 Broadway, New York City.
Lucas & Co., John.—Philadelphia, Pa.
Massachusetts Chemical Co.—Walpole, Mass.
Masury & Son, John W.—44-50 Jay St., Brooklyn, N. Y.
Mets Paint Co., P. A., The.—769 Clinton St., Buffalo, N. Y.
Murphy Varnish Co.—Chestnut and McWhorter Sts., Newark, N. J.
Patterson-Sargent Paint Co.—Cleveland, Ohio.
Sherwin-Williams Co.—47 Pearl St., Buffalo, N. Y.
Sherwin-Williams Co., The.—601 Canal Road, N. W., Cleveland, O.
Valentine & Co.—257 Broadway, New York City.

PANELS—WOOD

Bathner Hardwood Moulding Co.—1045 Park Ave., New York City.
Dann Bros. Co., The.—84 Franklin St., New Haven, Conn.
Ohio Scroll & Lumber Co.—Covington, Ky.
Shepard & Sons.—New Haven, Conn.

See Also Wood—Bent.

PAPER—INSULATING

Dunton & Co.—65 Atlantic Ave., Providence, R. I.

PASTE—SOLDERING

Dunton & Co.—65 Atlantic Ave., Providence, R. I.
Solderene Co.—53 State St., Boston, Mass.

PATCHES AND PLUGS—TIRE.

Ajax-Grieb Rubber Co.—Trenton, N. J.
Apstein, D.—Bridgeport, Conn.
Continental Rubber Works.—19th and Liberty Sts., Erie, Pa.
Empire Automobile Tire Co.—Trenton, N. J.
Goodrich & Co., B. F.—Akron, O.
Huntington Automobile Co.—Huntington, L. I., N. Y.
Inner Shoe Tire Co.—64 Monroe St., Grand Rapids, Mich.
M. & M. Mfg. Co.—Akron, O.
Morgan & Wright.—Detroit, Mich.
Travers Blow-out Patch Co.—1265 Broadway, N. Y. City.
Trenton Rubber Mfg. Co.—Trenton, N. J.
Victor Rubber Co., The.—Springfield, O.

PATTERNS.

Balkwill Pattern Works.—970 Hamilton St., Cleveland, O.
Dressler, Chas. E.—143-7 E. 23d St., New York City.
Ferro Machine & Foundry Co.—115 Wade Bldg., Cleveland, O.
Fulton Foundry & Machine Works.—25 Furnam St., Brooklyn, N. Y.
Gerson-Carey Co.—Kalamazoo St. and L. S. & M. S. R. R., Lansing, Mich.
Hartford Pattern & Model Co.—14 Hicks St., Hartford, Conn.
Hopson & Chapin Mfg. Co.—New London, Conn.
Manufacturers' Foundry Co.—Waterbury, Conn.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Model Pattern Works.—Washington and Perry Sts., Buffalo, N. Y.
Murray, W. F.—28 Beach St., Boston, Mass.
Olmstead & Co., H. B.—663 Manhattan Ave., Brooklyn, N. Y.
Paswell & We
 New York City
Standard Patte

PIPL—----

A. Z. Co., The.—
 York City.
Konigslow Mfg. C.,
 wood Road, Cleveland,
National Pipe Bending
 Lloyd Sts., New Haven, Conn.

PIPE-BENDS (Continued)

Ohio Blower Co., The.—330 Prospect Ave., N. W., Cleveland, O.
Standard Metalwork Co.—Thompsonville, Conn.
Whitlock Coil Pipe Co., The.—Elmwood St., Hartford, Conn.

PIPE—WROUGHT IRON AND STEEL.

Bridgeport Electric Plating Co.—Bridgeport, Conn.
Byres & Co., A. M.—Pittsburg, Pa.
Crane & Co.—519 S. Canal St., Chicago, Ill.
Harrisburg Pipe & Pipe Bending Co.—Harrisburg, Pa.
La Belle Iron Works.—Steubenville, O.
Longmead Iron Co.—Conshohocken, Pa.
Mark Mfg. Co.—Evanston, Ill.
Reading Iron Co.—Reading, Pa.
South Chester Tube Co.—Reading, Pa.
Youngstown Sheet & Tube Co.—Youngstown, O.
U. S. Cast Iron Pipe & Foundry Co.—280 Box Ave., Buffalo, N. Y.
United States Tube & Iron Co.—Pittsburg, Pa.
Western Tube Co.—Kewanee, Ill.
Whitlock Coil Pipe Co., The.—Elmwood St., Hartford, Conn.

PLATES—NAME.

Abbott, W. H.—1263 Broadway, N. Y. City.
Aluminum Mfg. Co.—Two Rivers, Wis.
Atwood Mfg. Co.—Amesbury, Mass.
Baltimore Enamel & Novelty Co.—Foot of Allen St., Baltimore, Md.
Balzer, Gus.—1556 Broadway, New York City.
Becker, August.—247 Atlantic Ave., Boston, Mass.
Blackington & Co., V. H.—Attleboro Falls, Mass.
Chandler Co., The.—31 Taylor St., Springfield, Mass.
Chicago Art Metal Works.—67 Lake St., Chicago, Ill.
Childs & Co., S. D.—200 S. Clark St., Chicago, Ill.
Crowe Metal Mfg. Co.—71 W. Jackson Blvd., Chicago, Ill.
Detroit Rubber Stamp Co.—99 Griswold St., Detroit, Mich.
Eastwood Wire Mfg. Co.—Belleville, N. J.
English & Mersick Co.—New Haven, Conn.
Greacen & Co., Walter.—12 Mechanic St., Newark, N. J.
Imperial Brass Mfg. Co.—245-47 S. Jefferson St., Chicago, Ill.
Meyercoed Co.—Chamber of Commerce, Chicago, Ill.
Monogram Crest & Sign Co.—125 E. 86th St., New York City.

PLATES—NAME (Continued)

Morse & Son, C. H.—13 S. Water St., Rochester, N. Y.
Murdock-Shaw Co.—125 Federal St., Boston, Mass.
New York Stencil Works.—100 Nassau St., New York City.
Quint & Sons, S. H.—15 S. 4th St., Philadelphia, Pa.
Rees, F. H., Steel Memorial Bldg.—Elmira, N. Y.
Robbins, Mfg. Co., John.—58 Kneeland St., Boston, Mass.
Rogers, C. E.—34 Beach St., Boston, Mass.
Smith Mfg. Co., The R. H.—Springfield, Mass.
Stafford Co., N.—67 Fulton St., N. Y. City.
Torrey Roller Bushing Co.—Bath, Me.
Turner Brass Works, The.—72 Michigan St., Chicago, Ill.

PLATING — ALUMINUM, BRASS AND NICKEL.

American Aluminum Coating Co.—100 Diamond Bank Bldg., Pittsburg, Pa.
Cassaday Fairbank Mfg. Co.—6106-30 La La Salle St., Chicago, Ill.
Hillman Plating Co.—446 Tremont St., Boston, Mass.
Hopson & Chapin Mfg. Co.—New London, Conn.
Imperial Brass Mfg. Co.—245-247 S. Jefferson St., Chicago, Ill.
Noonan Tool & Machine Works.—Rome, N. Y.

PLUGS—MAKE AND BREAK.

Didier, L.—4 rue Mercœur, Paris, France.
Dreval, Binoche, 'et Cie.—30 Rue Amelot, Paris, France.
Filogamo et Cie.—24 Via Mille, Turin, Italy.
Gianoli, Luigi, Filiale.—48 Via Solferino, Milan, Italy.
Hennegrave et Agnus.—30 Rue Perrier, Levallois, Perret, France.
Henrique, Jean-Francois.—54 Quai de Courbevoie, Courbevoie, France.
Kohler, Otto und Co.—Bülowlstrasse 57, Berlin, Germany.
Lavoisier, L.—10 Rue Jules-Macé, Paris, France.
Marceau, P.—10 Rue Camille-Desmoulin, Levallois (Seine), France.
Onland Van der Kastele—Utrecht, Holland.
Timperley, Chas.—14 Mary Ann St., Birmingham, England.
Weckerlein und Stöcker.—Wiederstrasse 7, Nürnberg, Germany.

PLUGS—SPARK.

- Abelos, H.**—11 Rue Baspail St., Ouen, France.
A. E. C., Société.—24 Rue Folie-Merichourt, Paris, France.
Albright Mfg. Co.—Columbus, O.
Aldigier.—110 Rue d' Angoulême, Paris, France.
American Coil Co., Inc.—Cor. Wall and Cocasset Sts., Foxboro, Mass.
American Lava Co.—27-33 William St., Chattanooga, Tenn.
American Mach. Mfg. Co.—41 Lewis Wharf, Boston, Mass.
Arc Spark Mfg. Co.—125 W. 32d St., New York City.
Arc-Toledo-Spark Plug Co.—Toledo, O.
Atlantic Motor Supply & Screw Co.—48 Binford St., Boston, Mass.
Ateliers, H. Leclerc, Société Anonyme.—33 Quai St., Leonard, Liège, Belgium.
Auto Appliance Co.—24 Mechanic St., Newark, N. J.
Auto Novelty Co.—Milwaukee, Wis.
Baird-Banks Mfg. & Supply Co.—35 Warren St., New York City.
B. & J. Mfg. Co.—3985 Cottage Grove Ave., Chicago, Ill.
Benford, E. M.—497 Lincoln Ave., Mt. Vernon, N. Y.
Benjamin Electric Mfg. Co.—42 W. Jackson Blvd., Chicago, Ill.
Benoist, H.—30 bis, Rue Bergere, Paris, France.
Benton & Stone.—Birmingham, England.
Big 4 Spark Plug Co.—104 John R. St., Detroit, Mich.
Boehny, R.—Zürich, Switzerland.
Boiron, J.—43 Rue de Tilsit, Paris, France.
Bougie Vale.—97 Rue St. Lazare, Paris, France.
Bougie Westland.—9 Rue Théophile-Gautier, Neuilly-sur-Seine, France.
Champion Co., Albert.—541 Tremont St., Boston, Mass.
Charter & Co.—303 Dearborn St., Chicago, Ill.
Cie des Megnetos Simms-Bosch, Ltd.—22 Rue Violet, Paris, France.
City Ignition Co.—14 Spencer St., Goswell Road, London, E. C., England.
Climax Igniter Co.—Amesbury, Mass.
Compound (Allumage Electrique).—Levallois (Seine), France.
Cros, J., et A. Laboureau.—12 Rue des Poissoniers, Neuilly-sur-Seine, France.
Darbilly, H., et Cie.—12 Rue Vincent, Paris, France.
Dayton Electric Mfg. Co.—87 St. Clair St., Dayton, O.
De Dion, Bouton et Cie.—Quai National, Puteaux, France.
Delta Mfg. Co.—Bloomfield, N. J.
De Luxe Mfg. Co.—Buffalo, N. Y.

PLUGS—SPARK (Continued)

- De Ploeg, S.**—58 Rue Michel-Bizot, Paris, France.
Dieble, Wm.—904 Lippincott Bldg., Philadelphia, Pa.
Drevdal, Binoche et Cie.—30 Rue Amelot, Paris, France.
Dubied et cie, Edouard.—Couvett, Switzerland.
Duplex Ignition Co., Inc.—307 W. 36th St., New York City.
East London Rubber Co.—2-8 Great Eastern St., London, England.
Elbridge Electric Co.—Elbridge, N. Y.
Electric Ignition Co.—Sparkbrook, Birmingham, England.
Electro-Industrielle (Société Anonyme).—40 Rue de Chemin-Vert, Paris, France.
Excelsior Spark Plug Co.—Cleveland, O.
Fischer Special Mfg. Co.—2076 Reading Road, Cincinnati, O.
Fremy, E.—57 Bvd. du Hainaut, Brussels, Belgium.
Fry Co., T. C. & W. L.—201 Brighton Ave., Rochester, Pa.
Fulmer, C. F.—Plainfield, N. J.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
Generator Valve Co.—294-6 Taaffe Place, Brooklyn, N. Y.
Gianoli, L.—26 Bvd. Magenta, Paris, France.
Grant Mfg. & Machine Co.—90 Sillman Ave., Bridgeport, Conn.
Guenet, J.—5 Rue de Montmorency, Paris, France.
Hardy Co., R. E.—86 Watts St., New York City.
Hennegrave et Agnus.—30 Rue Perrier, Levallois (Seine), France.
Herbert, W. H.—3312 Wabash Ave., Chicago, Ill.
Herz & Co.—203-205 Lafayette St., New York City.
Holcombe & Co.—45 Vesey St., New York City.
Hub Lubricator Co.—Portland Bldg., Boston, Mass.
Hussenot et Raynaud.—39 Rue La Boetie, Paris, France.
Hydra (Société Electrique).—60 Bvd. de Clichy, Paris, France.
Igniter Appliance Co.—723 Central Ave., Cleveland, O.
Invieta, Société.—5 Rue Déves, Neuilly (Seine), France.
Jeffrey-Dewitt Co.—2nd ark, N. J.
Kent Spark Plug Co.—Brooklyn.
Knoblock-Heideman Mfg.—Bend, Ind.
Kokomo Electric Co.—339 S Kokomo, Ind.
K. W. Ignition Co., The.—Bldg., Cleveland, O.

PLUGS—SPARK (Continued)

Labitte, E.—7 Rue Bordier, Aubervilliers, France.
Lacoste et Cie.—28 Bvd. de Strasbourg, Paris, France.
Leng's Son & Co., John S.—33 Murray St., New York City.
Lévede, R.—29 Rue Brunel, Paris, France.
McCanna Mfg. Co.—56 N. Jefferson St., Chicago, Ill.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Metal Specialties Mfg. Co.—14-24 W. Randolph St., Chicago, Ill.
Metzger, C. A., Inc.—203 W. 80th St., New York City.
Mica Mfg. Co.—307 West Broadway, New York City.
More Power Co.—619 Gorham St., Lowell, Mass.
Mosler & Co., A. R.—163 W. 29th St., New York City.
Never Miss Spark Plug Co.—321-23 Michigan Ave., E., Lansing, Mich.
Nieuport.—9 Rue de Seine, Paris, France.
North & Pfeiffer Mfg. Co.—72 Chestnut St., New Britain, Conn.
Oakes & Dow Co.—15 Chardon St., Boston, Mass.
Officine Türkheimer.—4 Via Lambro, Milan, Italy.
Ogden & Co., E. C.—Alexander House, 56a Ludgate Hill, London, E. C., England.
Orswell Ignition Co.—102 Pearl St., Boston, Mass.
Peerless Equipment Co.—170 S. Clinton St., Chicago, Ill.
Peto & Radford, Ltd.—Ashted, Surrey, England.
Pioneer Brass Works.—418-424 S. Penna St., Indianapolis, Ind.
Pittsfield Spark Coil Co.—Dalton, Mass.
Prested Miner's Gas Indicating Electric Lamp Co., Ltd.—Elthorne Road, Holloway, London N., England.
Progressive Mfg. Co., The.—Torrington, Conn.
Rajah Auto Supply Co.—147 Washington St., New York City.
Rex Motor Co.—69 Woodward Ave., Detroit, Mich.
Richardson Engineering Co.—Hartford, Conn.
Rubay, Leon.—136 West 38th St., New York City.
Ryley, J. A.—23½ Martineau St., Birmingham, England.
Sauser, Jacggi und Co.—Soleure, Switzerland.
Schug Electric Co., The.—326 Jefferson Ave., Detroit, Mich.
Seidler-Miner Electric Co.—207 Jefferson Ave., Detroit, Mich.
Sherman-Lemke Coil & Supply Co.—106 Wisconsin St., Milwaukee, Wis.

PLUGS—SPARK (Continued)

Société d'Electricité Nilmelior.—47 Rue Lacordaire, Paris, France.
Société l'Oléo.—38 Rue de la Folie-Regnault, Paris, France.
Splitdorf, Chas. F.—261-5 Walton Ave., New York City.
Standard Co.—Torrington, Conn.
Thurston Mfg. Co., The.—356 E. 57th St., Chicago, Ill.
Tingley & Co., Chas. O.—Rahway, N. J.
Tritt Electric Co.—301 Division St., Union City, Ind.
Triumph Engineering Co.—223 Lafayette St., New York.
United Motor Industries, Ltd.—Shelburne Works, Coventry, England.
United States Coil Co.—Jersey City, N. J.
Williams, E. Q.—533 S. Clinton St., Syracuse, N. Y.
Willis Co., E. J.—8 Park Place, New York City.
Willyoung Appliance Co.—Ludlow Station, Yonkers, N. Y.
Witherbee Igniter Co.—541 W. 43d St., New York City.

POLISH—METAL.

Adams & Elting Co.—155 W. Washington St., Chicago, Ill.
Allers & Co., Harry A.—136 Liberty St., New York City.
Amer. Metal Polish Co.—89 Winslow Ave., West Somerville, Mass.
Auto Shine Co.—Box 94, Buffalo, N. Y.
Badger Chemical Mfg. Co.—143 Reede St., Milwaukee, Wis.
Bell Mfg. Co., The.—113 Morgan St., St. Louis, Mo.
Bott Bros. Mfg. Co., The.—166 N. High St., Columbus, O.
Childs Co., G. B., The.—499 Greenwich St., New York City.
Cleaner Mfg. Co.—28-44 Olive St., St. Louis, Mo.
Cross, W. H.—18-20 Franklin St., Brooklyn, N. Y.
Diamond Porcelain Co.—Trenton, N. J.
Eagle Mfg. Co.—383 Prospect St., Cleveland, O.
Fairchild & Bro., M. H.—119 Michigan St., Chicago, Ill.
Gramlich Chemical Co.—167 Leveret St., Detroit, Mich.
Harris, A. W., Oil Co.—330 Water St., Providence, R. I.
Harvey Chemical Co.—Lafayette, Ind.
Hassler Co., Owen C.—1543 Milwaukee Ave., Chicago, Ill.
Hinds & Coon.—126 Pearl St., Boston, Mass.
Hoffman, Geo. W.—55 E. Washington St., Indianapolis, Ind.
Leader Mfg. Co.—1808 Chestnut St., St. Louis, Mo.
Leavitt, Gilbert.—11 India St., Boston, Mass.

POLISH—METAL (Continued)

- Liberty Association.**—12 State St., Chicago, Ill.
Lord Polish Co., F. T.—Cambridge, Mass.
Marshall Chemical Co.—80 William St., New York City.
Matchless Metal Polish Co.—94 Market St., Chicago, Ill.
Mexican Mfg. Co.—239 S. Main St., Wichita, Kan.
Monarch Mfg. Co.—Toledo, O.
Moore Co., Inc., Geo. P.—721 Golden Gate Ave., San Francisco, Cal.; 231 12th St., Oakland, Cal.; 332 Broadway, New York City; 1005 S. Main St., Los Angeles, Cal.
National Cement & Rubber Mfg. Co.—3053-59 Monroe St., Toledo, O.
Newbern Co., S. C.—430 Walnut St., Philadelphia, Pa.
Noxal Polish Mfg. Co.—1238 Belmont Ave., Philadelphia, Pa.
Paul & Co., J. C.—59 Dearborn St., Chicago, Ill.
Puritan Soap Co.—500-504 Exchange St., Rochester, N. Y.
Raimes & Co.—50 Ferry St., New York City.
Rath Mfg. Co.—Hancock, Laurel and 2d Sts., Philadelphia, Pa.
Sheppard, W. S.—22 Lawrence St., Newark, N. J.
Speare's Sons & Co., Alden, The.—369 Atlantic Ave., Boston, Mass.
Stanley, J. T.—650 W. 30th St., New York City.
Ulrich & Co.—Buffalo, N. Y.
Young, Orlando W.—180 Freylinghuyzen Ave., Newark, N. J.

PORTABLE GARAGES, *see* HOUSES
AND GARAGES, PORTABLE

PRESSURE GAUGES, *see* GAUGES,
AIR, STEAM AND PRESSURE

PROPELLERS

- Camden Anchor-Rockland Machine Co.**—Camden, Me.
Craig, James.—556 W. 34th St., New York City.
Cushman Motor Co.—2020 North St., Lincoln, Neb.
Duluth Gas Engine Works.—Minnesota Ave. and Vine St., Duluth, Minn.
Spaulding Engine Co.—St. Joseph, Mich.

PUBLICATIONS — MOTOR AND
SCIENTIFIC.

- Acetylene Journal.**—324 Dearborn St., Chicago, Ill.
Aérophile L.—84 Rue du Faubourg Saint Honoré, Paris, France.
Album des Sports.—12 Rue Boule, Paris, France.

PUBLICATIONS—MOTOR AND
SCIENTIFIC (Continued)

- Allgemeine Automobile-Zeitung.**—35 Deutsches Kolonialhaus, Berlin, W. Germany.
Allgemeine Automobile-Zeitung.—Fleischmarkt, Vienna, Austria.
Allgemeine Sport Zeitung.—1 St. Anna-hoff, Vienna, Austria.
American Chauffeur.—193f Broadway, New York City.
American Institute of Electrical Engineers.—25 W. 39th St., New York City.
American Machinist.—505 Pearl St., New York City.
American Magazine of Aeronautics.—142 West 65th St., New York City.
American Society of Civil Engineers.—320 W. 57th St., New York City.
American Society of Mechanical Engineers.—25 W. 39th St., New York City.
Amica del Automobilista L.—19 Rue Maria Vittoria, Turin, Italy.
Annales Industrielles et Scientifiques, Les.—66 Faubourg Montmartre, Paris, France.
Annales Techniques, Les.—52 Rue Saint Georges, Paris, France.
Annual Baudry de Saunier.—20 Rue Duret, Paris, France.
Annuaire de la Carrosserie et de L'Automobil.—14 Rue Lafayette, Paris, France.
Annuaire de la Route.—6 Place de la Concorde, Paris, France.
Annuaire de la Traction Automobile.—138 Rue Amelot, Paris, France.
Annuaire Général de L'Automobil.—38 bis, Avenue de la Grande Armée, Paris, France.
Annuaire Général des Sports Illustré.—125 Rue Montmartre, Paris, France.
Annales, Société fermière des.—35 Rue Lafayette, Paris, France.
Archives Syndicades de L'Automobil et du Cycle.—23 Avenue des Champs Elysées, Paris, France.
Auto Bulletin, The.—821 Prudential Building, Newark, N. J.
Auto, D.—5-8 Klein Heiligland, Haarlem, Holland.
Auto, L'.—71 Foro Bonaparte, Milan, Italy.
Auto Review, The.—St. Louis, Mo.
Auto, Société Anonyme du Journal L.—10 Rue du Faubourg Montmartre, Paris, France.
Autocar, The.—20 Tudor St., London, E. C., England.
Automobil, Das.—7 Ohmachstrasse, official organ of the A. C. d'Alsac, Strasbourg, Alsace, Germany.
Automobil Revue.—29 Boulevard Extérieur, Berne, Switzerland.
Automobil-Welt.—16 Lindenstrasse, Berlin, Germany.

PUBLICATIONS—MOTOR AND SCIENTIFIC (Continued)

Automobile L'.—7 Rue Saint Benoit, Paris, France.
Automobile L'.—12 Via Aurelio Saffi, Milan, Italy.
Automobile, The.—Class Journal Pub. Co., Flatiron Bldg., New York City.
Automobile Belge, L'.—50 Rue Grétry, Brussels, Belgium.
Automobile Blue Book.—Class Journal Pub. Co., Flatiron Bldg., New York City.
Automobile Dealer & Repairer.—The Motor Vehicle Pub. Co., 24 Murray St., New York City.
Automobile en Seine-et-Oise, L'.—42 Rue d'Angiviller, Versailles, Seine-et-Oise, France.
Automobile-revue du littoral, L'.—27 Avenue de la Gare, Nice, Alpes Maritimes, France.
Automobile Topics.—Times Bldg., New York City.
Automobile and Carriage Builders' Journal.—16 Eldon St., London England.
Automobilia.—108 Boulevard Clichy, Paris, France.
Automobil'a and Anglo-Saxon Herald.—108 Boulevard de Clichy, Paris, France.
Automation, L'.—2 bis, Rue Edouard Detaille, Paris, France.
Automotor Journal, The.—Published by F. King & Co., Ltd., 44 St. Martins Lane, London, W. C., England.
Automovilismo Ilustrado, El.—24 Muntaner, Barcelona, Spain.
Autonautique, L'.—4 bis, Avenue Ma-laussena, Nice, Alpes-Maritimes, France.
Bicycling World and Motorcycle Review.—154 Nassau St., New York City.
Canadian Electrical News and Engineering Journal.—Confederation Life Bldg., Toronto, Ont., Canada.
Canadian Motor, The.—1 Wellington St., W., Toronto, Ont., Canada.
Car, The.—168 Picadilly, London W., England.
Carriage Dealers' Journal.—Troy, N. Y.
Carriage Monthly.—1006 Arch St., Philadelphia, Pa.
Cassier's Magazine.—3 W. 29th St., New York City.
Castings.—Cleveland, O.
Commercial Vehicle, The.—1402 Broadway, New York.
Comptes Rendus de L'Academic des Sciences.—Paris, France.
Cycle and Automobile Trade Journal.—1213 Filbert St., Philadelphia, Pa.
Cycle and Motor Trader.—London, England.
Electrical Review.—13 Park Row, New York.
Electrical World.—239 W. 39th St., New York.

PUBLICATIONS—MOTOR AND SCIENTIFIC (Continued)

Engineer, The.—355 Dearborn St., Chicago, Ill.
Engineer, The.—London, England.
Engineering.—London, England.
Engineering Record, The.—239 W. 39th St., New York.
Engineers' Review.—Cleveland, O.
Fahrzeug, Das.—Eisenach, Allemagne, Germany.
Fore "N" Aft.—Chicago, Ill.
Foundry.—Browning Bldg., Cleveland, Ohio.
Gas Engine, The.—514 Main St., Cincinnati, O.
Gas Power.—St. Joseph, Mich.
Gazetta Dello Sport.—10 Via Santa Radegonda, Milan, Italy.
Horseless Age, The.—9-15 Murray St., New York City.
Hub, The.—24 Murray St., New York City.
India Rubber Review.—Akron, O.
India Rubber World.—35 W. 21st St., New York.
Industrial Motor Review.—89 Fleet St., London, England.
Industrie Vélocipédique et Automobile.—75 Rue Vieille du Temple, Paris, France.
Intermédiaire Automobile, L'.—39 Rue d'Isly, Algiers, Algeria.
International Motor Cyclopaedia.—Times Bldg., New York City.
International Motor Review, The.—30 Rue de Loudres, Paris, France.
Iron Age, The.—14 Park Place, New York.
Iron Moulders' Journal.—Cincinnati, O.
Journal of Electricity, Power and Gas.—Rialto Bldg., San Francisco, Cal.
L'Echo des Eports.—13 Rue du Faubourg Montmartre, Paris, France.
L'Electricien.—Paris, France.
La France Automobile.—68 Avenue de la Grande Armée, Paris, France.
La Locomotion Automobile.—15 Rue Bouchut, Paris, France.
Machinery.—49 Lafayette St., New York City.
McClurg & Co., A. C.—215-21 Wabash Ave., Chicago, Ill. Maps and Route Guides.
Motor.—New Publication Co., 2 Duane St., New York City.
Motor, The.—7 Rosebury Ave., London, England.
Motor Age.—1200 Michigan Ave., Chicago, Ill.
Motor Boat.—1133 Broadway, New York City.
Motor Boat.—7 Rosebery Ave., London, England.
Motor Boating.—138 Liberty St., New York City.

PUBLICATIONS—MOTOR AND
SCIENTIFIC (Continued)

- Motorboat, Das.**—89 Lutstrasse
Deutsches Kolonialhaus, Berlin W. 35.
Germany.
- Motor Car Journal.**—27 Charing Cross
Road, London, England.
- Motor Car Magazine.**—108 Fulton St.,
New York City.
- Motor Car World, The.**—73 Dunlop St.,
Glasgow, England.
- Motor Cycle, The.**—20 Tudor St., Lon-
don, England.
- Motocycle, Le.**—56 Rue Pergolèse, Paris,
France.
- Motocycle Illustrated, The.**—Drexel
Bldg., Broad and Wall Sts., New York
City.
- Motocyclette, La.**—2 Avenue Victoria,
Paris, France.
- Motor Field.**—Denver, Colo.
- Motoring.**—Stair Bldg., Toronto, Can-
ada.
- Motoring Illustrated.**—11 Arundel
Strand, London, England.
- Motor News.**—92 Griswold St., Detroit,
Mich.
- Motor News.**—Dublin, Ireland.
- Motor Print.**—418-20 Sansom St., Phila-
delphia, Pa.
- Motor Traction.**—London, England.
- Motor Trader, The.**—19 Wilson St., Lon-
don, England.
- Motor Vehicle Register, The.**—227-31 S.
6th St., Philadelphia, Pa.
- Motorwagen, Der.**—11 Kurfurtenstrasse,
Berlin, Germany.
- Motor Way.**—Monadnock Block, Chica-
go, Ill.
- Motor World.**—154 Nassau St., New
York City.
- Motor World and Industrial Vehicle Re-
view.**—73 Dunlop St., Glasgow, Eng-
land.
- New England Automobile Journal.**—
Providence, R. I.
- Nice Automobile.**—4 Avenue Malaus-
séna, Nice, France.
- Omnia.**—20 Rue Duret, Paris, France.
- Pacific Motoring.**—835 S. Spring St., Los
Angeles, Cal.
- Petites Annales Judiciaires du Cycle et de
L'Automobile.**—35 Rue Bergère, Paris,
France.
- Poids Lourd, Le.**—1 Rue Tardien, Paris,
France.
- Power.**—505 Pearl St., New York City.
- Power Boating.**—Browning Bldg., Clevel-
and, Ohio.
- Power Wagon, The.**—American Trust
Bldg., Cleveland, Ohio.
- Practical Engineer.**—London, England.
- Pratique Automobile Vulgarisée, La.**—
101 Avenue Henri Martin, Paris,
France.
- Rapiditas.**—2 Via Catania, Palermo,
Italy.

PUBLICATIONS—MOTOR AND
SCIENTIFIC (Continued)

- Revue de L'Association Générale Auto-
mobile.**—8 Place de la Concorde, Paris,
France.
- Revue Commercial Automobile.**—16 Rue
d'Argenteuil, Paris, France.
- Revue Francaise de Constructions Auto-
mobiles.**—34 Rue de Charonne, Paris,
France.
- Revue de Mecanique.**—Paris, France.
- Revue des Publications Automobiles.**—
27 Rue Bellu, Paris, France.
- Revue du Tourisme et des Sports.**—20
Rue de la Pompe, Paris, France.
- Revue de Touring Club de France.**—65
Avenue de la Grand Armée, Paris,
France.
- Revue des Transports Automobiles.**—29
Quai des Grands Augustins, Paris,
France.
- Royal Automobile Club Journal.**—119
Picadilly, W., London, England.
- Rudder, The.**—9 Murray St., New York
City.
- Schnaufferl, Das.**—Armullstrasse, Munich,
Germany.
- Scientific American.**—361 Broadway,
New York.
- Sibley Journal of Engineering.**—Ithaca,
N. Y.
- Sicilia Sportiva.**—Palerma, Sicily.
- Société Internationale des Electriciens,
Buuletin of.**—Paris, France.
- Société de Publications Automobile.**—27
Rue Ballu, Paris, France.
- Sport, Le.**—22 Rue de la Braie, Brussels,
Belgium.
- Sport Universel Illustré, Le.**—13 Rue de
Londres, Paris, France.
- Sports, Les.**—20 Rue Saint Marc, Paris,
France.
- Sports, Les Modernes.**—24 Boulevard des
Capucines, Paris, France.
- Sportsman, Le.**—14 Rue d'Or, Brussels,
Belgium.
- Suisse, La Sportive.**—16 Rue de Hesse,
Geneva, Switzerland.
- Technical Literature Co.**—220 Broadway,
New York.
- Technical World Magazine.**—Chicago,
Ill.
- Technique Automobile, La.**—49 Quai des
Grands Augustus, Paris, France.
- Toot Toot.**—311 Battery St., San Fran-
cisco, Cal.
- Tourisme, Le.**—17 Rue d
France.
- Vie Automobile, La.**—49
Grands Augustins, Paris, Frar
- Vie au Grand Air, l'**
l'Opera, Paris, Franc
- Vie Illustrée, La.**—12:
Paris, France.
- Yacht, Le.**—55 Rue
Paris, France.

PUBLICATIONS—MOTOR AND SCIENTIFIC (Continued)

Yachting.—20 Vesey St., New York.
Yachting Gazette.—41 Rue Meyerbeer, Paris, France.

PUMPS—AIR, FUEL.

American Steam Pump Co.—Battle Creek, Mich.
Boston Auto Exchange.—177 Berkeley St., Boston, Mass.
Bridgeport Brass Co.—Bridgeport, Conn.
Byrne, Kingston & Co.—339-51 Smith St., Kokomo, Ind.
Christensen, N. A.—1212 Harman Bldg., Milwaukee, Wis.
Gleason-Peters Air Pump Co.—Mercer and Houston Sts., New York City.
Henion & Hubbell—69 N. Jefferson St., Chicago, Ill.
Humphreys Mfg. Co.—201 E. 5th St., Mansfield, O.
Imperial Brass Mfg. Co.—245-47 S. Jefferson St., Chicago, Ill.
Konigslow Mfg. Co., Otto.—2279 Clarkswood Road, Cleveland, O.
Leng's Son & Co., John S.—33 Murray St., New York City.
Lunkenheimer Co., The.—Cincinnati, O.
Manhattan Screw and Stamping Works.—West End Ave. and 67th St., New York City.
Martin & Anson Co.—2226 Indiana Ave., Chicago, Ill.
Reason Automatic Air Pump Co.—Pontiac, Mich.
Rumsey & Co.—Seneca Falls, N. Y.
Shaffer Machine & Mfg. Co., The.—211 N. Calvert St., Baltimore, Md.
Union Steam Pump Co.—Battle Creek, Mich.
Wilson & Co., F. Cortez.—239-41 Lake St., Chicago, Ill.

PUMPS—BOILER.

American Steam Pump Co.—Battle Creek, Mich.
Dieter Steam Engine Works.—123 Liberty St., New York City.
Kilburn, Edwin.—Spring Valley, Minn.
Ofeldt & Sons, August.—123 Liberty St., New York City.
Union Steam Pump Co.—Battle Creek, Mich.

CIRCULATING.

Engineering Co.—Goshen St., Norwell, London S. E., England.
Idruz, A.—24 Rue d'Armaille, Paris, France.
Motor Accessories Co.—Birmingham, England.
& Power Appliance Co.—The Arcade, Cleveland, O.
nger, F.—Montléliard, Doubs, France.

PUMPS—CIRCULATING (Continued)

Blanke und Rast.—Leipzig-Plagwitz, Germany.
Brennan Motor Co.—Syracuse, N. Y.
Brown & Sharp Mfg. Co.—Providence, R. I.
Brownell Motor Co., F. A.—634-6 Lexington Ave., Rochester, N. Y.
Cleveland Faucet Co., The.—706 Frankfort Ave., N. W., Cleveland, O.
De Boisse, J.—85 Rue Traversière, Billancourt, France.
Deloffre, Auguste.—32 Route de la Gare, Le Cateau, Nord, France.
Dubrulle, Louis.—28 bis, Rue Villeneuve, Clichy-sur-Seine, France.
Ferretti, Alfredo.—151 Via dei Fiori, Turin, Italy.
Garvin Machine Co.—Spring and Varick Sts., New York City.
Grouvelle, H. Arquembourg, et Cie.—71 Rue du Moulin Vert, Paris, France.
Hill, E. H.—56 Broomhall, Sheffield, England.
Imperial Brass Mfg. Co.—245-47 S. Jefferson St., Chicago, Ill.
Judd & Leland Mfg. Co.—Hibbard Ave., Clifton Springs, N. Y.
Lefebvre fils, Albert.—5 Rue Delteral, Pré St. Gervais, Paris, France.
Lipman Mfg. Co.—300 Pleasant St., Beloit, Wis.
Lobee Pump & Machinery Co.—Corner Terrace and Erie Sts., Buffalo, N. Y.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Mietz, A.—138 Mott St., New York City.
Milwaukee Motor Co.—615 Clyborn Ave., Milwaukee, Wis.
New York Gear Works.—56 Greenpoint Ave., Brooklyn, N. Y.
Oberdofer Brass Co., M. L.—804 East Water St., Syracuse, N. Y.
Palous und Beuse.—Zimmerstrasse, 30, Berlin, Germany.
Pelton Gasolene Engine Works.—Lyons, La.
Precision Appliance Co.—832 Austin Ave., Chicago, Ill.
Pullen & Co., F. A.—7 St. Martins Lane, Cannon St., London, England.
Puritan Machine Co.—12-16 Gratiot Ave., Detroit, Mich.
Ross, H. S.—5607 S. Halsted St., Chicago, Ill.
Schmitz und Co.—Höchst-am-Main, Germany.
Schaeffer und Oehlmann.—Chausseestrasse 46, Berlin, Germany.
Thomet et Cie, A.—125 Rue du Theatre, Paris, France.
Verstraete Mfg. Co., Ed.—421 Clinton St., Milwaukee, Wis.
Weidner, Richard.—Leipzig, Germany.
Wilcox, W. H., & Co.—23 Southwark St., London, S. E., England.

PUMPS—OIL.

American Injector Co.—Detroit, Mich.
Codman & Shurtleff, Inc.—120 Boylston St., Boston, Mass.
Detroit Lubricator Co.—Trumbull and Lincoln Aves. and G. T. Ry., Detroit, Mich.
Eastern Oil Tank Co.—136 Fletcher St., Lowell, Mass.
Essex Brass Co., G. B.—480 Franklin St., Detroit, Mich.
Hauck-Seebach Co.—291-295 Essex St., Brooklyn, N. Y.
Imperial Brass Mfg. Co.—245-47 S. Jefferson St., Chicago, Ill.
Lavigne Mfg. Co.—Detroit, Mich.
Lunkenheimer Co., The.—Cincinnati, O.
Madison-Kipp Mfg. Co.—Madison, Wis.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Michigan Lubricator Co.—661-671 Beau-bien St., Detroit, Mich.
National Cycle Mfg. Co.—Bay City, Mich.
National Oil Pump & Tank Co.—Day-ton, O.
Noera Mfg. Co.—Waterbury, Conn.
Ohio Brass Co.—Mansfield, O.
Precision Appliance Co.—832 Austin Ave., Chicago, Ill.
Sherwood Mfg. Co.—Elmwood Ave. and Belt Line, Buffalo, N. Y.
Star Brass Mfg. Co.—108-114 E. Ded-ham St., Boston, Mass.
Tokheim Mfg. Co.—815 N. 1st St., West Cedar Rapids, Ia.
Western Oil Pump Co.—2447 Kosciusko St., St. Louis, Mo.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, O.

PUMPS—TIRE.

Adie & Nephew, Ltd.—156 Warstore Lane, Birmingham, England.
Amoudruz, A.—24 Rue d'Armaille, Paris, France.
Artizan Brass Co.—204 Lincoln Park Bvd., Chicago, Ill.
Auto Pump Co.—Springville, N. Y.
Bell, D. M.—Franklin and Michigan Sts., Chicago, Ill.
Benton & Stone—Bracebridge St., Bir-mingham, England.
Berthon, P.—17 Cité Dupont, Paris, France.
Berton, F.—17 Rue de la Courdes-Noues, Paris, France.
Blankenagel, Gebrüder.—Bielefeld, Ger-many.
Bridgeport Brass Co.—Bridgeport, Conn.
Buisson, Gustave-Adolph.—1 Rue Ame-lot, Paris, France.
Caux et Périer.—29 Avenue Parmentier, Paris, France.
Codman & Shurtleff, Inc.—120 Boylston St., Boston, Mass.

PUMPS—TIRE (Continued)

Colonial Brass Co.—316-18 Seneca St., Cleveland, O.
Comiot, C.—87 Bvd. Gouvion-St. Cyr, Paris, France.
Compton d'Innovations Pour Automo-biles.—16 Ave. de la Grande, Armée, Paris, France. United States Branch, 1693 Broadway, New York City.
Desponts.—150 Rue Victor Hugo, Le-vallois, Seine, France.
Domecq-Cazaux et Cie.—75 Avenue de Wagram, Paris, France.
Duffield & Funk.—3 Love Lane, Easte-heap, London, E., England.
Empire Automobile Tire Co.—Trenton, N. J.
Empire State Tire Co.—Buffalo, N. Y.
Ferodowill Mfg. Co.—St. Paul, Minn.
Franskin, Felix.—35 Rue Memling, Cu-reghem, Brussels, Belgium.
Früs, Jul.—6 Osterfarimagsgade, Cop-enhagen, Denmark.
Garnier, E.—19 Rue de la Répubic, Or-leans, France.
Grouvelle, H. Arquembourg, et Cie.—71 Rue du Moulin Vert, Paris, France.
Hagedorn & Co., A.—12 Paul St., Fins-bury, London, E. C., England.
Hagendorfer und Werdermann.—Treb-bin, Germany.
Herz & Co.—203-205 Fafayette St., New York City.
Hill, E.—Beta Works, Sheffield, Eng-land.
Humphrey's Mfg. Co.—201 East 5th St., Mansfield, O.
Hunt, Hedley & Co.—29 College St., Cannon St., London, England.
Hussenot et Raynaud.—39 Rue la Boé-tie, Paris, France.
Imperial Brass Mfg. Co.—245-47 S. Jef-ferson St., Chicago, Ill.
Jones, W. H.—134 Waverly Ave., New-ton, Mass.
Judd & Leland Mfg. Co.—Hibbard Ave., Clifton Springs, N. Y.
Kaestner, Carl.—69 Berlinerstrasse, Leipzig, Germany.
Klarner, Arthur.—12 Elisenstrasse, Leip-zig, Germany.
Leather & Brass Mfg. Co.—24-26 E. Gen-esee St., Auburn, N. Y.
Lucas, Jos., Ltd.—G eat King St., Bir-mingham, England
Marcellis et Fils.—11 Liège, Belgium.
McCord & Co.—1400 C Chicago, Ill.
Michelin et Cie.—France.
Noera Mfg. Co.—
Rollet et Cie.—67 A France.
Ross, Courtney &
 brook Road, London, N., Eng.,

PUMPS—TIRE (Continued)

- Rotherham & Sons.**—27 Spon St., Coventry, England.
Scleverand, E. Morin, Successor.—48 Rue de l'Aqueduc, Paris, France.
Shawver Co.—Springfield, O.
Skinner & Skinner.—1337 Michigan Ave., Chicago, Ill.
Société de la Pompe Vadam.—366 Rue St. Honoré, Paris, France.
Standard Auto Supply & Mfg. Co.—20 Broad St., New York City.
Stevens & Co.—99 Chambers St., New York City.
Touzelet, J.—Dourdan, Siene-et-Oise, France.
Turner Brass Works, The.—72 Michigan St., Chicago, Ill.
Wildmann, Victor.—Offenbach, Germany.
Wray Pump & Register Co.—Rochester, N. Y.
Zierold, Arno.—Crimmitschau, Germany.

PUMPS—TIRE, POWER DRIVEN

- Gleason-Peters Air Pump Co.**—Mercer and Houston Sts., New York City.
Humphreys Mfg. Co.—201 E. 5th St., Mansfield, O.
Lippincott Steam Specialty & Supply Co.—Newark, N. J.
Pacific Tucking & Mfg. Co.—471-473 18th St., Brooklyn, N. Y.
Rotary Triplex Pump Co.—126-128 S. Jefferson St., Chicago, Ill.
Skinner & Skinner.—1337 Michigan Ave., Chicago, Ill.
Spacke Mach. Co., The F. W. S.—1ndianapolis, Ind.
Tiley-Pratt Co., The.—Essex, Conn.
Victor Electric Co.—55-61 Market St., Chicago, Ill.

RACKS—TRUNK

- Adapt Machinery Co.**—1624-34 Wabash Ave., Chicago, Ill.
Anderson & Co., F. W.—429 S. Broad St., office; 757 N. Uber St., factory, Philadelphia, Pa.
Connecticut Steel & Wire Co.—308 Pearl St., Hartford, Conn.
Duane & Co., W. J.—304 W. 54th St., New York City.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Fuller Co., G. W., The.—182 Asylum St., Hartford, Conn.
Hart Mfg. Co.—370 Atlantic Ave., Boston, Mass.
Manhattan Storage Co.—1611 Broadway, New York City.
Mason, John A.—1312-1316 Washington St., Newton, Mass.
Motor Car Supply Co., The.—1425-27 Michigan Ave., Chicago, Ill.

RACKS—TRUNK (Continued)

- Motorcycle Specialty Co.**—258 Columbus Ave., Boston, Mass.
Nolan, Wm.—541 Tremont St., Boston, Mass.
Noonan Tool & Machine Works.—Rome, N. Y.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Schubert Bros. Gear Co.—42-44 Cedar St., Oneida, N. Y.
Smith, Chas. A.—Church Lane and P. and R. Ry., Germantown, Philadelphia, Pa.
Smith Machine Co., H.—51 Godwin St., Paterson, N. J.
Teel Mfg. Co.—Medford, Mass.
Wilson & Co., F. Cortez.—239-41 Lake St., Chicago, Ill.

RADIATORS

- A. Z. Co., The.**—527 W. 56th St., New York City.
Albany Mfg. Co.—Cumberland Park, Willesden Junction, London, England.
Amourdrez, A.—24 Rue d'Armaille, Paris, France.
Apprin, P.—15 Rue David, Lyon, France.
Bachten et Callay.—Geneva, Switzerland.
Barbier et Brandon.—112 Rue d'Antonay, St. Etienne, France.
Baudier, Ch.—32 Rue Baudin, Levallois, France.
Behr-Zeller.—Stuttgart, Germany.
Benneckenstein, J.—Alte Jacobstrasse 139, Berlin, Germany.
Borichansky.—36 Rue Garnier, Neuilly, France.
Briquet et de Raet.—13 Rue de Manchester, Brussels, Belgium.
Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Chandler Co., The.—31 Taylor St., Springfield, Mass.
Cochaux, Emile.—Deville, Ardennes, France.
Colli y Bailo.—8 Passage de la Paz, Barcelona, Spain.
Compagnie Generale des Refroidisseurs Vendome.—2 Rue Danton, Levallois, France.
Corominas, Ricardo.—45 Torrente de la Olla, Gracia-Barcelona, Spain.
Delleani, A.—12 Via Montcaliéri, Turin, Italy.
Desponts.—150 Rue Victor Hugo, Levallois, France.
Detroit Auto Specialty Co.—090-11 Greenwood Ave., Detroit, Mich.
Establie Frères et Louis Establie.—13 Quai Valmy, Paris, France.
Fedders Mfg. Co.—57-59 Tonawanda Ave., Buffalo, N. Y.
Forest, G., et Cie.—32 Bvd. Henri IV, Paris, France.

RADIATORS (Continued)

Freund, Gustav.—10 Georgenstrasse, Berlin, Germany.
Cabillon, Jules-Ernst.—218 Chaussée de Mons, Brussels, Belgium.
Goudard et Menesson.—119 Rue de Montreuil, Paris, France.
Grouvelle et H. Arquembourg Cie.—71 Rue du Moulin Vert, Paris, France.
Guétat, J.—7 Rue Boutard, Neuilly, France.
Hayes Mfg. Co.—360-370 Maybury Ave., Detroit, Mich.
Jardet, B.—22 Bvd. Bourbon, Neuilly, France.
Kells Mfg. Co., W. J.—Jersey City, N. J.
Kinsey Mfg. Co.—Dayton, O.
Lawrence & Co.—Cheapside, London, E. C., England.
Le Brun, C. et H. Lecomte.—14 Rue Victor Hugo, Puteaux, France.
Lebrun et Cormerais.—10 Rue Lamoricière, Nantes, France.
L'Huillier et Duquesne.—62 Rue de Villiers, Levallois, France.
Livingston Radiator Co.—10 E. 31st St., New York City.
Long Mfg. Co.—1430-34 Michigan Ave., Chicago, Ill.
Long-Turney Mfg. Co.—Rome, N. Y.
Longuemare Frères.—16 Rue du Buisson St. Louis, Paris, France.
Lorthioy, E.—8 Rue de la Voute, Paris, France.
Loyal, A.—204 Rue St. Maur, Paris, France.
Mayo Radiator Co.—New Haven, Conn.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
Mégevet e Cie.—Turin, Italy; Bellegrade, Ain, France, and Geneva, Switzerland.
Metal Stamping Co.—243 West St., New York City.
Mondschein, Edouard.—10 Ave. Parmentier, Paris, France.
Neue Gas Industrie.—Ulm, Germany.
Neustadt Auto & Supply Co.—3948-50 Olive St., St. Louis, Mo.
Noye Mfg. Co.—50 Lake View Ave., Buffalo, N. Y.
Officine Türckheimer.—4 Via Lambro, Milan, Italy.
Ramier et Mauberqué.—109 Rue de Paris, Puteaux, France.
Reinhold Giese.—113 Ritterstrasse, Berlin, S., Germany.
Roger-Durand.—99 Bvd. Beaumarchais, Paris, France.
Sauerbier, Franz.—5 Forsterstrasse, Berlin, S., Germany.
Semmler, C.—58 rue de Paradis, Paris, France.
Société Anonyme des Radiateurs Egloff.—Zurich, Switzerland.

RADIATORS (Continued)

Swan & Co., S.—172 Pentonville Road, London, N., England.
Waterson & Son.—Birmingham, England.
Whitlock Coil Pipe Co., The.—Elmwood St., Hartford, Conn.
Windhoff Frères.—100 Ave. Parmentier, Paris, France.
Wolverine Radiator Co.—Detroit, Mich.
Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill.
Zimmerman, Dr.—Ludwigshafen-am-Rhein, Germany.

RAILS—ROBE.

Appliance Mfg. Co.—72-86 Jackson Bvd., Chicago, Ill.
Auto Rail & Equipment Co.—113 Michigan Trust Bldg., Grand Rapids, Mich.
Barlow Mfg. Co.—Holyoke, Mass.
Empire Gear & Top Co.—413 N. 22d St., Philadelphia, Pa.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Harper Co., Walter J.—229-231 Mulberry St., Newark, N. J.
Hillman Plating Co.—446 Tremont St., Boston, Mass.
Hume Carriage Co.—Amesbury, Mass.
Manhattan Storage Co.—1611 Broadway, New York City.
Mason, John A.—312 Washington St., Newton, Mass.
New York Coach & Auto Lamp Co.—794-98 10th Ave., New York City.
Polson, W. F.—22 W. Utica St., Buffalo, N. Y.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Smith & Co., Jos. N.—4th and Porter Sts., Detroit, Mich.
Teel Mfg. Co.—Medford, Mass.

RECTIFIERS—MERCURY ARC.

Electrical & Mechanical Development Co.—Asbury Park, N. J.
General Electric Co.—Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co.—Pittsburg, Pa.

REFLECTORS—LAMP.

Bausch & Lomb Optical Co.—Rochester, N. Y.
Macbeth-Evans & Co.—Pittsburg, Pa.
Matisse Mfg. Co.—New York City.
Scheidig & Co., John.—50 New York City.

REGULATORS—AND WATER.

Imperial Brass Mfg. Co.—245 Jefferson St., Chicago, Ill.
Lunkenheimer Company, Th.—nati, O.

**REGULATORS—FUEL, PRESSURE
AND WATER (Continued)**

- Offeldt & Sons, F. W.**—Nyack-on-the-Hudson, N. Y.
Walker & Co., E. C.—1913-23 Logan St., Louisville, Ky.

REPAIR SHOPS.

- Abrams, Chas. E.**—Chatham, N. Y.
Adapt Machinery Co.—1624 Wabash Ave., Chicago, Ill.
Agou & McLagou.—1131 Welton St., Denver, Colo.
Ainslie, George.—1140 Dean St., Brooklyn, N. Y.
Akron Automobile Garage.—Cor. Main and Cedar Sts., Akron, O. Supplies, garage, Franklin, Winton.
Albany Garage Co.—28-30 Howard St., Albany, N. Y. (Peerless, Thomas, Matheson, Isotta, 'Stevens-Duryea.) Supplies; garage.
Allenhurst Garage & Autc Station.—135-7 W. 37th St., New York City. Garage and renting.
Amos-Pierce Auto Co.—109-11-13 S. State St., Syracuse, N. Y. Pierce-Arrow.
Anderson & Wilkens.—125 W. 49th St., New York City.
Anderson Auto Co.—41-3 Downer Place, Aurora, Ill. Supplies, garage, Rambler, White.
Archer, Wesley R.—78 West St., New Haven, Conn.
Archer & Co.—1597 Broadway, New York City. (Hotchkiss.)
Army Cycle Mfg. Co.—130-32 Meeting St., Charleston, S. C. Garage, Cadillac, Buick.
Asheville Cycle & Auto Co.—15 Lexington Ave., Asheville, N. C. (Cadillac, Knox.) Garage.
Atlantic Motor Car Co.—1776 Broadway, New York City. Stoddard-Dayton.
Auburn Automobile Co.—Water St., Auburn, N. Y. (Franklin, Pope-Hartford, Royal, Northern.) Supplies; garage.
Auto Import Co.—1786 Broadway, New York City. (Rochet-Schneider.)
Auto Livery & Repair Co.—1426 Glenarm St., Denver, Colo.
Auto Machine Works.—Corona, Cal. (.) Garage.
aintenance Co.—205 N. Jackson, Chicago, Ill.
obile Exchange & Storage Co.—5-7-9 W. 38th St., New York City. (ond-hand cars.) Garage.
obile Hack Co.—115 State St., Savannah, Ga.
obile School of America.—742 7th, New York City.
obile Station.—42-48 Pleasant St., Manchester, N. H. Supplies, Garage.

REPAIR SHOPS (Continued)

- Auto Motor Car Co.**—804-8 Sycamore St., Cincinnati, O. (Beriet, Rainier, Welch, Stoddard-Dayton, Baker, Rapid Delivery Wagons, Couple Gear Electric Trucks.) Garage.
Auto National Renting Co.—109 W. 37th St., New York City.
Auto Rebuilding Co.—802 Beecher St., Indianapolis, Ind.
Auto Shop Co.—731 Vincent Ave., Cleveland, O. (Thomas-Detroit, Franklin.) Garage.
Avery, F. E.—1199 Franklin Ave., Columbus, O. Packard, Thomas Flyer, Franklin, Winton.
Ayer Automobile Station.—East Main St., Ayer, Mass. Supplies, garage.
Ayer Mfg. Co.—Keokuk, Ia.
A. Z. Co., The.—527 W. 56th St., New York City.
Bache, T. A.—33 Herkimer Pl., Brooklyn, N. Y.
Baldner Motor Vehicle Co.—Church and Whitney Sts., Xenia, O.
B. & H. Motor Car Co.—147-49-51 W. 49th St., New York City. Garage.
Ball, Charles A.—56-62 Palmetto St., Brooklyn, N. Y.
Ballou, J. P.—175 Washington St., North Attleboro, Mass. Supplies, garage.
Barco, Geo. L. W.—Palm Beach, Fla. Rambler.
Batavia Machine Co., The.—24 Main St., op. Hotel Richmond, Batavia, N. Y. Supplies.
Bath Automobile & Gas Engine Co.—Broad and Commercial Sts., Bath, Me. (Winton, Franklin, Cadillac.) Supplies; garage.
Baughner, J. L.—Staunton, Va. (Rambler.) Garage.
Bellinger's Garage.—10-12 Landers St., near Broadway, Newburg, N. Y. Supplies, garage.
Berkshire Cycle & Automobile Co.—92½ Main St., North Adams, Mass. Garage.
Binford's Auto Station.—26 S. Clarkson St., Chicago, Ill.
Bingham's Auto Garage.—Grand River Ave. and 5th St., Detroit, Mich.
Blanchard Mach. Co.—64 State St., Cambridge, Mass.
Blue Ribbon Garage.—291 Fairfield Ave., Bridgeport, Conn. (Columbia, Winton, Cadillac, Franklin, Lozier.) Supplies; garage.
Boda & Co., Robert F.—22 East Rich St., Columbus, O. (National, Mitchell.) Garage.
Bolton Automobile Co.—Mt. Royal Ave. and Dolphia St., Baltimore, Md. (Ford, Reo, Premier.) Garage.
Bowman Automobile Co., Sidney B.—225-31 W. 49th St., New York City. (Clement-Bayard, Apperson.) Garage.

REPAIR SHOPS (Continued)

- Bradley, S. L.**—809 N. Main St., Princeton, Ill. (Knox, Oldsmobile.) Garage.
Braswell, O. E.—Rowlands, N. C.
Bratt, Ande.—1548 Broadway, Denver, Colo.
Brazier Auto Works.—38th St. and Market St., Philadelphia, Pa. (Marmon.) Garage.
Brennen, Wm.—Church St., Seabright, N. J.
Bressler, H. J.—Sterling, Ill.
Bristol Automobile Co.—Naugatuck Rd., Waterbury, Conn. (Thomas Flyer, Thomas-Detroit.) Garage.
Britton, R. D. & C. O., Co.—115 Allyn St., Hartford, Conn. Maxwell.
Broadway Automobile Co.—Madison St. and Broadway, Seattle, Wash. (Pierce Great Arrow, Autocar, Knox, Cadillac, Wood's Electric, Baker Electric, Packard.)
Browning Bros. Co.—Ogden, Utah. Mitchell.
Bryant Garage.—50-56 W. 43d St., New York City. Garage.
Buckeye Auto Co.—753 E. Long St., Columbus, O.
Buckeye Garage Co.—6112 Euclid Ave., Cleveland, O.
Buell, J. C.—Rives Junction, Vt.
Buffalo Auto Exchange.—401 Franklin St., Buffalo, N. Y. (Franklin.) Garage.
Buffalo Electroplating Co.—78 Oak St., Buffalo, N. Y.
Bug Thunder Mfg. Co.—Belvidere, Ill.
Bulkley Auto Station.—Southport, Conn. Corbin.
Bullock, E. A.—Norfolk, Neb.
Burmester Rubber Co.—83 Church St., Boston, Mass.
Busse, W. G.—478 Sumner Ave., Brooklyn, N. Y.
Cachat & Co., C. M.—1718 Crawford Rd., Cleveland, O.
Cadillac Motor Car Co.—265 Jefferson Ave., Detroit, Mich. (Cadillac.) Garage.
Cain, A. H.—Roodhouse, O.
Cameron Auto Co.—313 Commerce St., Dallas, Tex. (Buick, Franklin, Pope-Toledo.) Garage.
Campbell Auto Co.—Fort Dodge, Ia., and Des Moines, Ia. (Reo, Rambler, Mason.) Garage.
Canfield Auto Stations.—Canaan, Conn. (Knox, Stevens-Duryea, Waltham.) Garage.
Capital Garage.—337 Water St., Augusta, Me. Supplies, garage.
Capitol Hill Auto Co.—Pine St. and Broadway, Seattle, Wash. (Mitchell, Rambler.) Garage.
Carlow Automobile Co.—51-59 Weir St., Taunton, Mass. (Winton, Buick.) Garage; supplies.

REPAIR SHOPS (Continued)

- Carman, J. R.**—1546 E. Broad St., New Castle, Ind.
Carmichael-Bray Co., Inc.—370 Golden Gate Ave., San Francisco, Cal. (Elmore.) Garage.
Carthage Auto Garage.—Carthage, Mo. (Maxwell.) Garage.
Case, George W.—54 Front St., Port Jervis, N. Y. (Rambler, Ford.) Garage.
Caulkins & Co., F. L.—405-415 Main St., Middletown, Conn. (Cadillac, Knox, Winton, Pope-Hartford.) Supplies; garage.
Centaur Motor Co.—53-61 Franklin St., Buffalo, N. Y. (Peerless, Pope-Toledo, Winton, Autocar, Oldsmobile, Cadillac, Darracq.) Garage.
Central Auto Co.—Cor. Jackson Bvd. and Franklin St., Chicago, Ill. Garage. second-hand cars.
Central Auto Station.—236 Maint St., New Britain, Conn. (Stevens-Duryea.) Garage.
Central Automobile Station Co.—55 West St., Pittsfield, Mass. (Pierce-Arrow, Franklin, Pope-Hartford, Stevens-Duryea.) Supplies; garage.
Central Garage.—Durfee St., opp. Armory, Fall River, Mass. Supplies, garage.
Central Motor Car Co.—Washington and Fair Sts., Bloomfield, N. J. (Mitchell, Jackson.) Garage.
Champaign Automobile Co.—Champaign, Ill. (Reo, Premier.) Garage.
Charleston Motor Co.—161 Meeting St., Charleston, S. C. (Reo, Premier.) Garage.
Chase, L. O.—193 Main St., Oshkosh, Wis. Thomas.
Chateau des Beaux Arts.—Huntington, L. I. Supplies, garage.
Chatfield, C. B.—1201 Center Ave., Bay City, Mich. (Haynes.) Garage.
Chelsea Auto Station Co.—516 W. 37th St. and 517 W. 36th St., New York City. (Manhattan.) Garage.
Chicago Caloric Engine Co.—536 Wabash Ave., Chicago, Ill.
Chicago Vulcanizing Co.—1461 Michigan Ave., Chicago.
Chisholm-Phil Automobile Co.—5906-8 Euclid, (Stevens-Duryea)
Christ, Scott & Co.—N. Y. Garage, De
Cincinnati Automol—5th St., Cincinnati
 Pope-Hartford, Peerless
 garage.
Cincinnati Motor Vehicle Co.—Pl., Cincinnati, O. (Pope-Marmon.) Garage.

REPAIR SHOPS (Continued)

- Citizens' Motor Car Co.**—N. E. cor. 7th and Main Sts., Cincinnati O. Packade, Pierce Arrow, Cadillac, Autocar, Columbus.) Garage.
- City Cycle & Auto Co.**—29 Railroad St., Cortland, N. Y. Garage.
- Clark, B. B.**—Livingston, Orange County, Fla. (Waltham.) Garage.
- Clarksdale Machinery & Supply Mfg. Co.**—Clarksdale, Miss. Garage.
- Clarkson & Oliver.**—601-3 Mesquit St., Corpus Christi, Tex. (Northern, Ford, Rapid, Oldsmobile.) Garage.
- Cleveland Motor Car Co.**—1470 Michigan Ave., Chicago, Ill. Cleveland.
- Clinger, E. E.**—Grand Island, Neb.
- Close Bros.**—405 Smith St., Schenectady, N. Y. (Knox, Cadillac.) Supplies; garage.
- Clouser, M. E.**—New Smyrna, Fla.
- Clute Bros.**—49 Mohawk St., Cohoes, N. Y. (Pope-Hartford, Pope-Waverley, Royal.)
- Colegroove & Rollins.**—South Side, Garrett, Ind.
- College St. Garage.**—College St., Toronto, Canada.
- Collison's Garage.**—Cor. Church and Maple Sts., Burlington, Vt. Supplies, garage.
- Colonial Garage.**—Narragansett Pier, R. I. Supplies, garage.
- Colonial Garage.**—220 W. 30th St., New York City. (Second-hand cars.) Garage.
- Consolidated Bicycle & Motor Co., Ltd.**—185 Notre Dame St., E., and 224 Logan Ave. and 849 Main St., Winnipeg, Canada. Garage.
- Cook & Spring.**—440 Drayton St., Savannah, Ga.
- Cook, Fred W.**—Niles, Mich. (Northern.)
- Cooper, I.**—864 Bedford Ave., Brooklyn, N. Y.
- Corbaley & Thorpe Auto Co.**—443-449 Emerson, St., Palo Alto, Cal. (Autocar, Columbia, Sunset, Maxwell.) Garage.
- Core, G. W.**—High St., Columbus Grove, O. (Mitchell, Rambler.)
- Cowan, W. K.**—830-32-34 Broadway, Los Angeles, Cal. (Rambler.) Garage.
- Crane, J. E.**—922, 926, 930 18th St., Denver, Colo. (Second-hand cars.) Garage.
- Crescent Auto & Machine Co.**—Cor. E. 2d St. and Marr St., Fond du Lac, Wis. (Cadillac, Buick, Pope-Hartford, White.) Garage.
- Crescent Automobile Co.**—2565 Boulevard, Jersey City, N. J. (Cadillac, Pope-Hartford, Pope-Toledo.) Garage.
- Croffe, A. C.**—Main St., Sellersville, Pa. (Rambler.) Garage.
- Crosby & Co., S. L.**—186 Exchange St., Bangor, Me. (Reo, Knox.)

REPAIR SHOPS (Continued)

- Crowley, J. J.**—1319 E. Market St., Akron, O.
- Crozier, Cary.**—West Side, Muncie, Ind.
- Cryder & Co.**—583-85 Park Ave., New York City. (Mors, Renault.) Garage.
- Cuddeback, E. R.**—122-124 E. 4th St., Fremont, Neb. (Stoddard-Dayton, Reo, Ford, Mason, Premier.) Garage.
- Culp Bros.**—307 Forest Ave., Pacific Grove, Cal. Garage.
- Culp, T. S.**—625 to 631 Mahoning St., Canton, O. (Gale & Wayne.) Garage.
- Dann's Auto Station, J. T.**—314 Main St., Danbury, Conn. Supplies, garage.
- Darracq Motor Car Co.**—1989 Broadway, New York City; repair shop, 20 W. 60th St. Darracq.
- Davidson, Adam.**—13th Ave. and Lake St., Melrose Park, Ill.
- Davis Automobile Co., Inc.**—7 Dorrance St., Providence, R. I. (Winton, Peerless, Locomobile, Cadillac, Darracq.) Supplies; garage.
- Demster Machinery Co., W. R.**—16th and Walnut Sts., Kansas City, Mo. Supplies, garage.
- De Witt Auto Co., The.**—248-50 W. 80th St., New York City. Garage, recharging batteries.
- Disbrow Bros'. Garage.**—Hillside Ave. and Hoffman Blvd., Jamaica, L. I. (Rainier, Ford, White, Stearns.) Garage; supplies.
- Doherty, H. B.**—24 Wall St., Binghamton, N. Y. (Cadillac, Franklin, Darracq, American, Mercedes.)
- Dominick, Wm.**—542 Wabash Ave., Chicago, Ill.
- Dominion Motor Car Co., Ltd.**—11 Beaver Hall Hill, Montreal, Canada. Supplies, garage.
- Dow & Whitman.**—125 Golden Gate Ave., San Francisco, Cal. Rambler.
- Dowling's Garage.**—26-30 Forest Ave., Portland, Me. (Thomas Flyer, Tourist.) Supplies; garage.
- Dow Portable Electric Co.**—Adams St., Braintree, Mass. Garage.
- Doyleston Auto & Motor Cycle.**—18 Donaldson St., Doyleston, Pa. Cadillac, Pierce Arrow.
- Duerr & Co., C. A.**—77th St. and Broadway, New York City. (Royal.)
- Duerr, J. J.**—122-24 Northwest St., Bellevue, O. Jackson.
- Easland, John N.**—Main St., near Berkshire Inn, Great Barrington, Mass. Supplies, garage.
- East Liberty Automobile Co.**—5969 Center Ave., Pittsburg, Pa. Jackson.
- Electric Vehicle Co.**—134 W. 39th St., New York City. (Columbia.) Garage.
- Emery Bros.**—Kennebunkport, Me.
- Empire State Motor Car Co.**—2148-50 Broadway, New York City. (Craig-Toledo, Queen.) Garage.

REPAIR SHOPS (Continued)

- Eschinger, E. A.**—715 E. 13th St., N. W., Washington, D. C.
Eustace, E. J., Jr.—46 119th St., Whitney, Ind.
Fawcett, C. E.—119-121 3d Ave., Cedar Rapids, Ia. (National.) Garage.
Fay & Scott.—Dexter, Me. (Reo, Maxwell.) Garage.
Fayette Automobile Co., E.—76 E. Fayette St., Uniontown, Pa. (White, Peerless, Reo, Holsman.) Garage.
Felker Auto Co.—1535 Tremont St., Denver, Colo. (Stevens-Duryea, Peerless, Waltham, Pope-Waverley.) Garage.
Fellwock Automobile & Mfg. Co.—320-322 Upper 4th St., Evansville, Ind. (Maxwell, Mitchell, Stoddard-Dayton, National, Baker, Ford.) Garage.
Pickling & Co., Inc.—154 E. 57th St., New York City.
Fillow Garage, A. H.—87 West St., Danbury, Conn.
Fire-Proof Garage.—1061-62 Main St., North Adams, Mass. Supplies. Garage.
Fisher Auto Co.—330 Illinois Ave., Indianapolis, Ind. (National, Stoddard-Dayton, Mitchell, Maxwell.) Garage.
Fitt, James.—106 Commercial St., Rochester, N. Y.
Fixit Shop.—Moyer St., Canajoharie, N. Y. Garage.
Flatbush Motor Car Co.—Snyder and Bedford Aves., Brooklyn, N. Y. (Corbin, Columbus Electric.) Garage.
Flatrock Automobile Co.—Flatrock, Ind. Garage.
Flushing Auto Garage.—107 Broadway, Flushing, N. Y. Garage.
Forest Hill Garage.—Verona and Clinton Aves., Newark, N. J.
Forsyth & Davis.—Garage at 777 Broadway, Kingston, N. Y. Garage.
Fort Pitt Automobile Co.—Baum St. and Euclid Ave., Pittsburg, Pa. (Stearns, Locomobile, Oldsmobile.) Garage.
Foss Hughes Motor Car Co.—221 N. Broad St., Philadelphia, Pa. (Pierce Arrow, Cadillac, Baker.) Garage.
Foster & Brown.—Main St., Westbrook, Me.
Frayer-Miller Motor Car Co.—62nd St. and Broadway, Motor Mart, New York City. (Frayer-Miller.) Repairing Frayer-Miller cars only.
Fritz, J. S.—Cambridge, O. Garage.
Futer, B. Franklin.—213 N. Duke St., Lancaster, Pa. (Acme, Maxwell.) Garage.
Gable, Frank.—Alamosa, Colo.
Garage Italiano.—Calle de San Diego y Colon, Mexico City, Mexico.
Gardner Motor Co.—4388 Olive St., St. Louis, Mo.

REPAIR SHOPS (Continued)

- Garford Motor Car Co.**—1540-42 Broadway, New York City. (Garford.)
Garret Engine Works.—Quincy St., Garret, Ind.
Gates' Garage.—Bellows Falls, Vt. Supplies.
Geneva Automobile Co.—145 Castle St., Geneva, N. Y. (Cadillac.) Supplies and garage.
Gerome, T. F.—130-32 W. 18th St., New York City. Garage.
Gibson Auto Co.—238 Massachusetts Ave., Indianapolis, Ind. (Ford, Premier.)
Gillespie & Co., L. W.—Marion, Ind.
Githens Bros. Co.—1328 Michigan Ave., Chicago, Ill. (Oldsmobile, Stearns.)
Gorson's Auto Exchange.—617-19 Arch St., Philadelphia, Pa. (Second-hand cars.)
Granagan, P. J.—Jackson St., Sandusky, O. Garage. (Ford.)
Grass Terrace Garage.—Rear 1396 Madison St., Chicago, Ill. Supplies; garage.
Greene & Warnick.—Stewart St., Amsterdam, N. Y. (Pope-Toledo, Stevens-Duryea.) Supplies; garage.
Greenfield Automobile Co.—21 Federal St., Greenfield, Mass. (Rambler, Ford.) Supplies; garage.
Greenwich Automobile Station.—Cor. Greenwich and Boston Post Rd., Greenwich, Conn. Garage.
Greer Motor Car Co.—60-68 W. Van Buren St., Chicago, Ill. (Pungs-Finch.)
Grow Auto Garage & Machine Shop.—300 F St., Maryville, Cal. (Oldsmobile, Winton.) Garage.
Gulstine & Waskey.—Madison, S. D. (Buick.) Garage.
Gurnee, B. S.—Hanford, Cal. (Ford, Buick, Auburn, Reo.) Garage.
Guy, Mark.—Asbury Park, N. J.
Hackensack Auto Co.—Main St., Hackensack, N. J. (Maxwell.) Garage.
Hackett Motor Car Co.—218 Paterson St., Paterson, N. J. (Mack Bros. motor trucks.) Garage.
Hadlock, W. Y.—15 N. Main St., Manchester, N. H. (Rambler, Queen.) Supplies; garage.
Hall Bros.—1613 Euclid Ave., Cleveland, O. (Cartercar, Reliance Trucks, Rapid Trucks, Climax Light Delivery W:
Hall, E. G.—111 E. Broadway wood, Tex. (Cadillac.) Ga
Ham & Ross.—23 S. College lotte, N. C. (Maxwell.) G...
Hamilton Garage Co.—133135 E. West Hamilton, Canada. Franklin, Maxwell.), Gar
Hamilton Motor Car Co.—Hamilton, O. (Buick, Elmore.) age.

REPAIR SHOPS (Continued)

- Hannan & Henry Motor Co.**—29-31 Catherine St., Ogdensburg, N. Y. (Cadillac, Buick.) Garage.
- Hansen & Co., A.**—44 Hubbard St., Chicago, Ill.
- Hard, Dr. A. D.**—Marshall, Minn. (Waltham.)
- Harder's Gun Works.**—Clearfield, Pa. (Waltham, Thomas. Buick, Franklin, Cadillac, Pope-Waverley.) Garage.
- Harrisburg Auto Co.**—3rd St. and Hamilton Ave., Harrisburg, Pa. (Stanley, Reo, Rambler, Logan, National, Babcock.) Garage.
- Hartford Suspension Co.**—67 Vestry and 212 W. 88th St., New York City. (Gobron-Brillie.) Garage.
- Hathorn Auto Co.**—Cor. 5th and Washington Sts., Mason City, Ia. (Winton, Cadillac, Northern, Buick, White Steamer.) Garage.
- Hawkins, H. I.**—Downers Grove, Ill.
- Hawkinson, O.**—Maynard, Minn. (Waltham.) Garage.
- Haynes Automobile Co.**—1715 Broadway, New York City. Repairing Haynes cars only. (Haynes.)
- Haynes Automobile Co.**—1420 Michigan Ave., Chicago, Ill. Repairing Haynes cars only. (Haynes.)
- Haynes Motor Car Co.**—1030 Golden Gate Ave., San Francisco, Cal. (Haynes.)
- Hege Co., Oscar F.**—317 Main St., Winston-Salem, N. C. (Cadillac.) Garage.
- Heierman & Bros., Frank.**—177-23 E. 5th St., Austin, Tex. (Jewel.)
- Henkelman, Chas. E.**—1724-26 Atlantic Ave., Atlantic City, N. J. Garage.
- Herkimer Motor Car Co.**—124-26 Albany St., Herkimer, N. Y. (Maxwell.) Supplies; garage.
- Herrick Bros.**—Bethel, Me. (Maxwell, Reo.)
- Heustis, Thos.**—Bristol, R. I.
- Highgrade Autocar Co.**—9-11 Hill St., Newark, N. J.
- Hiland Automobile Co.**—5811-17 Center Ave., Pittsburg, Pa. (Peerless, Buick.) Garage.
- Hill Mfg. Co.**—100 Worth Ave., Allegheny, Pa.
- Jos. B.**—106-18 Main St., Lakeland, N. J. (American Mercedes, Locomobile, Pope-Waverley, Columbia.)
- Jamb Co.**—105 Goffe St., New Haven, Conn. (Babcock, Cadillac, Franklin.)
- Jan Co., The.**—Broadway and 56th St., New York City. (Hoi-Tan, Fiat.)

REPAIR SHOPS (Continued)

- Hoppenyon Auto Co., The.**—301 2nd St., E. Ashland, Wis. (Ford, Reo.) Garage.
- Haupt Co., Harry S.**—63rd St., and Broadway, New York City. (Thomas.) Garage.
- Haupt Co., Harry S.**—Philadelphia, Pa. (Thomas.) Garage.
- Houston Motor Car Co.**—417 San Jacinto St., Houston, Tex. (Thomas, Stevens-Duryea, Cadillac.) Garage.
- Howe Motor Car Co.**—11 Park Ave., Paterson, N. J. (Reo, Premier.) Garage.
- Hutchinson Bros.**—Rock Bay, Victoria, B. C. (Oldsmobile, Swift.)
- Illinois Garage & Mfg. Co.**—110 S. Mill St., Pontiac, Ill.
- Independence Auto Co.**—5989 Center Ave., Pittsburg, Pa.
- Ingalls Garage Co.**—State St., Newburyport, Mass. Garage; supplies.
- Irvin Machine Works.**—335 Golden Gate Ave., San Francisco, Cal.
- Jackson Motor Car Co.**—103 Court St., Brooklyn, N. Y. (Jackson.) Garage.
- Jamestown Iron Works Co.**—Jamestown, N. Y. Garage.
- Jarvis, Levi.**—Pingree, N. D. (Jewel.)
- Jewett's Garage.**—58 Pleasant St., Claremont, N. H. (Rambler, Maxwell.) Supplies; garage.
- Johnson Carriage Co.**—Forest St. and East Ave., New Canaan, Conn. Garage; supplies.
- Jones & Shumacker.**—Wilmington, Del.
- Kanies & O'Connors.**—Troop St., Woodstock, Ill.
- Keating Garage Co.**—145 W. 2nd St., Oswego, N. Y. Garage; supplies.
- Keaton & Chevalier.**—521 Van Ness Ave., San Francisco, Cal.
- Keats Auto Co., H. L.**—87 7th St., Portland, Ore. (Thomas Flyer, Thomas-Detroit, Pope Toledo, Pope-Hartford, Pope-Waverley, Franklin, Buick, Oldsmobile.)
- Keenan Bros.**—273 Valencia St., San Francisco, Cal.
- Kehoe Co., The E. J.**—1659 Broadway, New York City. Garage. (Continental Car and Runabout.)
- Kensington Garage.**—712-14 Coney Island Ave., nr. Ave. D., Brooklyn, N. Y. Supplies; garage; renting.
- Kent, E. P.**—1754 Welton St., Denver, Colo.
- Kentucky Automobile Co.**—1051 3rd Ave., Louisville, Ky. (Cadillac, Peerless, Knox, Buick, Pope-Waverley.) Garage.
- Ketchum & Co.**—Bank and Spark Sts., Ottawa, Canada. (Oldsmobile, Ford.) Garage.

REPAIR SHOPS (Continued)

- Kimball & Co., C. P.**—315 Michigan Ave., Chicago, Ill. (Rauch and Lang.)
- King, A. A.**—Lake Hopatcong, N. J. (Ford.)
- Kirchdorfer Automobile Co.**—1702 Baxter Ave., Louisville, Ky. (Reo, Premier.)
- Klaiss, H. P.**—123 E. Market St., Tiffin, Ohio.
- Koenig Bros.**—Broadway, bet. Central Ave. and Main St., Tarrytown, N. Y. (Premier, Reo.) Garage; supplies.
- Knox Auto Co. of Ill.**—1208 Michigan Ave., Chicago, Ill. (Knox.)
- Kutzkau, H. T.**—Tonopah, Nev. (Simplex, Isotta-Fraschini, Thomas, Oldsmobile.) Garage.
- Ladewig & Stock Co.**—277 Madison St., Waukesha, Wis. Garage.
- La France Motor Co.**—753 5th Ave., New York City. (Cottin & Desgouttes.)
- Lambert & Von Tacky.**—16 N. Franklin St., Titusville, Pa. (Pierce Arrow, Stevens-Duryea.) Garage.
- Lawrence Motor Car Co.**—13-17 W. Warren St., Lawrence, Kan. (Ford.) Garage.
- Lawson's Garage.**—810-16 South St., Peekskill, N. Y. (Cadillac, Pope-Hartford, Pope-Toledo.) Supplies; garage.
- Leckner, H. B.**—1162 St. Albans Ave., Detroit, Mich.
- Leiding, H. T.**—145 State St., W., Savannah, Ga.
- Leonard, H. W.**—625 W. Broad St., Elyria, O. (Jackson.) Supplies; garage.
- Lisk & Petry.**—405-407 Diamond St., Hudson, N. Y. (Stevens-Duryea, Cadillac, Thomas.) Supplies; garage.
- Livingston, C. V.**—Rondout, N. Y.
- Lockwoor & Co., F. E.**—39 Wall St., Norwalk, Conn. (Locomobile, Waltham, Autocar, Elmore, White.) Supplies; garage.
- Locomobile Co.**—400 Newbury St., Boston, Mass. (Locomobile.) Garage.
- Lothrop-Davis Co.**—Tonopah, Nev. Garage.
- Loud, F. A.**—Merrimac, Mass.
- Lovejoy Novelty Works.**—2nd St., Laramie, Wyo. Garage.
- Lowell Automobile Co.**—Appleton St. and Post Office Ave., Lowell, Mass. (Stevens-Duryea, Cadillac, Pope-Hartford, Stanley.) Supplies; garage.
- Lowe Garage, S. C.**—22 4th St., New Bedford, Mass. (Locomobile, Oldsmobile, Franklin.) Garage.
- Lucas, C. O.**—Front St., Greenville, O.
- Lutz Co., Wm. F.**—Santa Anna, Cal. (Buick.)
- Mac Innis, D. A. & J. C.**—120 Michigan St., Toledo, O.

REPAIR SHOPS (Continued)

- Magoon Motor Co., R. H.**—2174-80 9th St., S. E., Cleveland, O. (Pope-Toledo.) Supplies; garage.
- Mahonning Motor Repair Co.**—26-28 Warren Ave., Akron, O.
- Maine Motor Carriage Co.**—Cor. Free and South Sts., Portland, Me. (Haynes, Pope-Hartford, Stevens-Duryea.) Supplies; garage.
- Makarof, John A.**—2436 Michigan Ave., Chicago, Ill.
- Manning Forge Tool Co.**—Mannington, W. Va.
- Marble Auto Garage, W. H.**—69 Main St., Brockton, Mass. (Columbia, Locomobile, Cadillac, Knox, Winton.) Supplies; garage.
- Martin Automobile Co., F. L. C.**—3204 Park Ave., Plainfield, N. J. (Thomas Flyer, Franklin, Mercedes, Clement Bayard, Stevens-Duryea.) Garage.
- Martinsburg Auto Repair & Storage Co.**—118 S. Queen St., Huntington, W. V.
- Maxwell Bros.**—20 Church St., Roanoke, Va.
- McCloskey, J. S.**—Christina St., Sarnia, Canada.
- McCook Auto Co.**—308 W. Denison St., McCook, Neb. (Mason, Waltham.) Garage.
- McFarland & Gumpfer.**—1329 Michigan Ave., Chicago, Ill.
- Meadville Auto Garage.**—838 Market St., Malvern, Pa.
- Mead, W. L.**—295 Ridgewood Ave., South Orange, N. J.
- Mechaley Auto Co.**—30-40 Summer St., Stamford, Conn. (Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, Cadillac, White.) Garage; supplies.
- Meinders, Ed. H.**—211 W. High St., Piqua, O.
- Mercantile Motor Car Co.**—368 Cumberland St., Brooklyn, N. Y.
- Merchant, B. D.**—Central Ave., Alameda, Cal. (Pope-Hartford, Franklin, Royal, 8-Cyl. Hewitt.) Garage.
- Metropolitan Automobile Co.**—57-61 Stanhope St., Boston, Mass. Garage.
- Miami Automobile Co.**—13th St., bet. Aves. D and E, Miami, Fla. (Locomobile, Reo.) Garage.
- Miami Motor Car Co.**—117 E. 2nd St., Dayton, O. (Franklin, Haynes, Waltham.) Garage.
- Mianus Garage.**—
- Michaelis-Middlehauff Au**—Glenarm St., Denver, C. Garage.
- Miller Bros.**—Office 12 Maple St., (Buick.) Supplies.
- Nevada Automobile &**—Main St., Goldfield, N. Ramsey St., Goldfield, Toledo, Northern.) Garage

REPAIR SHOPS (Continued)

- Miller's Garage Co.**—1554-58 Fairfield Ave., Bridgeport, Conn. (Aerocar, Rapid, Glide, Maxwell.) Supplies.
- Miller, W. H.**—Walnut St., Champaign, Ill.
- Mississippi Valley Auto Co.**—3927 Olive St., St. Louis, Mo. (Couple-gear, Elmore, Pope-Toledo, Pope-Hartford, Pope-Waverley, Mercedes, Woods.) Electric charging.
- Missouri Valley Auto Co.**—1112-14 E. 15th St. and Troost Ave., Kansas City, Mo. (White.) Garage.
- Modern Machine Co.**—817 Washington St., Buffalo, N. Y.
- Monnot & Sacher.**—Salesroom and Garage. 305 S. Market St., Canton, O. Garage.
- Monumental Garage, The.**—1002 Morton St., Baltimore, Md. (Pungs-Finch, Maxwell.) Garage.
- Moore Edenfield Elec. & Mfg. Co.**—1033 Broad St., Augusta, Ga. (Franklin, Cadillac.) Garage.
- Moore, H. S.**—1761 Crawford Road, Cleveland, O. (Stoddard-Dayton.) Garage.
- Moriarty & Co., E. P.**—1612-14 Grand Ave., Kansas City, Mo. (Packard, Stevens-Duryea, Peerless, Knox.) Garage.
- Morris, A.**—Columbus Grove, O. Garage. (Cadillac, Buick, Franklin.)
- Morris' Auto Garage.**—Fulton St., Cor. Merrick Road, Jamaica, N. Y. Supplies; garage.
- Morrisville Foundry Co.**—Morrisville, Vt.
- Morse, T. S.**—Lenox, Mass. Supplies; garage.
- Motor Car Co. of N. J.**—289-93 Halsey St., Newark, N. J. (Autocar, Cadillac, Packard.) Garage; supplies; electric charging.
- Motor Car Maintenance Co.**—247-49 W. 40th St., New York City. Garage.
- Motor Transportation Co.**—565 Carroll Ave., Chicago, Ill.
- Mount & Bros., J. W.**—Red Bank, N. J.
- Mount Diablo Garage.**—Cor. Fernando and Colfax Sts., Concord, Cal. (Rambler.) Garage.
- Mulhaupt, F. J.**—227 N. 5th St., Lafayette, Ind.
- Mullenhour Mfg. Co., F. W.**—132 N. Union St., Lima, O.
- Mulock's Belmont Garage.**—13-15 S. Carolina Ave., Atlantic City, N. J. (Wayne, Rambler, Pullman.) Garage.
- Nalle, Ewell.**—601 E. 6th St., Austin, Tex. (Thomas, Buick.)
- Nashville Motor Car Co.**—Cor. Church St. and 9th Ave., Nashville, Tenn. (Dorris, Stanley.) Garage.
- Nettleton & Co., V. L.**—21 Hanchett St., Coldwater, Mich. (Rambler, Maxwell.) Garage.

REPAIR SHOPS (Continued)

- Newburgh Auto Shop, Youngs & Co., Inc.**—249 Grand St., Newburgh, N. Y. (Winton.) Garage.
- New London Auto Station.**—New London, Conn. (Thomas-Detroit, Thomas Flyer, Haynes.) Garage.
- Newport Engineering Works.**—359-65 Thames St., Newport, R. I. Supplies; garage.
- Newton Center Automobile Repair Station & Garage.**—Beason St., Newton Center, Mass. Garage.
- Niagara Falls Automobile Transit Co.**—103 Main St., Niagara Falls, N. Y. Supplies; garage. (Cadillac, Winton.)
- Northern Automobile Agency.**—Park Square, Motor Mart, Boston, Mass. (Northern.)
- North Philadelphia Auto Station.**—3425 N. Broad St., Philadelphia, Pa.
- Northwestern Motor Car Co.**—928-30 N. 20th St., Philadelphia, Pa. (Moline.) Garage.
- Nyberg Automobile Works.**—30th St. and Michigan Ave., Chicago, Ill. Garage.
- Official A. A. A. Blue Book Station.**—Concord, N. H. Supplies; garage.
- Official Auto Rep. Co.**—11 Eldridge Court, Chicago, Ill.
- Ogden, D.**—332 5th St., Columbus, Ind. (Reo, Jackson, Wayne, Haynes.) Garage.
- Ohio Valley Auto Co.**—Greenup, Ky. (Rambler.)
- O. K. Machine Works.**—887 Main St., Buffalo, N. Y. Supplies; garage.
- Osborn Iron Works.**—Redlands, Cal. (Tourist.) Garage.
- Ossen-Hunter Automobile Co.**—407 Golden Gate Ave., San Francisco, Cal.; also 50 W. St. John St., San Jose, Cal. (Mitchell.)
- Owen, Percy, Inc.**—1876 Broadway, New York City. Repairing Bianchi cars only. (Bianchi.)
- Pacific Coast Automobile Co.**—Seattle, Wash. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Thomas Flyer, Thomas-Detroit, Buick, Oldsmobile.) Garage.
- Packard, Chas. A.**—Townsend, Mass.
- Palace Auto Co.**—1408-1410 Walnut St., Kansas City, Mo. (Pierce Arrow, Oldsmobile, Columbia.) Garage.
- Palace Automobile Station.**—32 Hermon St., Worcester, Mass. (Rambler.) Garage.
- Palais de L'Automobile.**—1778 Broadway, New York City. (Delaunay-Belleville, Renault, Panhard.)
- Palmer & Singer Mfg. Co.**—1620-24 Broadway, New York City. Garage.
- Palmer, Frank.**—40-50 Jefferson Ave North Battle Creek, Mich. (Reo.) Supplies; garage.

REPAIR SHOPS (Continued)

- Panhard & Levassor.**—1881 Broadway, New York City. (Panhard.)
Parker, Surry.—Pine Town, N. C.
Parker & Co. Auto Station, D. L.—18 Market St., New Bedford, Mass. (Pope-Toledo, Pope-Hartford.) Supplies; garage.
Park Square Auto Station.—43 Columbus Ave., Boston, Mass. (Stoddard-Dayton, Bulieb.)
Parkway Garage Co.—110th St., Central Park West, New York City. Garage.
Parsons, Henry B.—Pine St., Stockbridge, Mass. Garage.
Pattison Mfg. So.—Rear, 48 Stanhope St., Boston, Mass. Garage.
Peerless Garage.—942-944 Bedford Ave., Brooklyn, N. Y. (Peerless.) Garage.
Peerless Motor Car Co.—220 W. 41st St., New York City. (Peerless.) Garage.
Peerless Motor Car Co. of N. E.—178 Columbus Ave., Boston, Mass. (Peerless.) Garage.
Pennsylvania Auto Agency.—7 Motor Mart, Park Square, Boston, Mass. (Pennsylvania, Pullman, Northern.)
Pequot Garage.—Pequot Ave., New London, Conn. Garage.
Perkins & Corliss.—65 Middle St., Gloucester, Mass. (Maxwell, Rambler.) Supplies.
Perkins Auto Garage.—Main St., Rockaway, N. J. Garage. (Corbin.)
Perkins, B. B.—St. Albans, Vt. (Cadillac, Franklin.) Garage.
Peters Bros.—Main St., Angonquin, Ill.
Philadelphia Auto Repair Shop.—230 N. 22d St., Philadelphia, Pa.
Pioneer Automobile Co.—520-534 20th St., Oakland, Cal. (Winton, Thomas, Oldsmobile.) Garage.
Pitman & Nelson Auto Co.—2036 Addison St., Berkeley, Cal. (Page-Adrian Touring Car.) Garage.
Pittsfield Auto Garage Co.—328 North St., Pittsfield, Mass. (Rapid, Maxwell, Berkshire.) Supplies; garage.
Pollard Auto Station.—230 Main St., Nashua, N. H. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, Cadillac.) Garage.
Pope Automobile Co. of Wash.—817-819 14th St., N. W., Washington, D. C. (Pope-Toledo, Pope-Hartford, Pope-Pope-Waverley, Locomobile, Auto-car.) Garage.
Pope Motor Car Co.—Casino Terrace, Newport, R. I. Supplies; garage.
Porrier, A.—Franklin St., Garden City, L. I., N. Y. (Maxwell.) Garage.
Portland Garage Co.—51 Cross St., Portland, Me.
Potter, Sidney E.—Bet. Elm and Walnut Sts., Pierce City, Lawrence County, Mo. (Ford.) Garage.

REPAIR SHOPS (Continued)

- Prichard, R. S.**—39-41 Gallia Ave., Portsmouth, O. Garage. (Winton, Buick, Pope-Waverley.)
Prinz & Schneider.—Springville, N. Y.
Probey Carriage Works.—32d and M Sts., Washington, D. C.
Puget Sound Auto Co.—1405-7 Broadway, Seattle, Wash. (National, Rambler, Babcock, Commerce Trucks.) Garage.
Pullman Auto Agency.—7 Motor Mart, Boston, Mass. (Pennsylvania, Pullman, Northern.)
Purinton, A. B.—126 Exchange St., Bangor, Me. (Columbia.) Supplies; garage.
Quackenbush, W. F.—1287 Madison Ave., New York City.
Quaker City Auto Co.—144 N. Broad St., Philadelphia, Pa. (Pope-Toledo, Pope-Hartford.) Garage.
Quogue Automobile & Bicycle Co.—Jes-sop Ave., Quogue, L. I., N. Y. Supplies and garage.
Rabenold, W. F.—28 N. 11th St., Allentown, Pa. (American Berliet, Dolson, Dragon.) Garage.
Rambler Motor Car Co.—Halsey and Crawford Sts., Newark, N. J.
Randall, A. G.—109 N. 11th St., Boise, Idaho. (Buick, Waltham.) Garage.
Ranney & Co.—1851 Broadway, New York City. (Elmore.) Garage.
Rayfield & Rayfield.—6523 Wentworth Ave., Chicago, Ill.
Reading Automobile Co.—26 S. 5th St., Reading, Pa. (Peerless, Franklin, Buick, Oldsmobile, Pope-Weverley.) Garage.
Reichert Automobile Co.—34-44 Temple St., New Haven, Conn. (Haynes, Waltham.) Supplies; garage.
Reliance Automobile Co.—547-57 Fulton St., San Francisco, Cal. Garage; supplies.
Renstrom Co., Frank O.—424 Stanyan St., San Francisco, Cal. (Pullman, Pennsylvania.) Supplies; garage.
Reo Motor Car Co. of Philadelphia.—242 N. Broad St., Philadelphia, Pa. (Reo, Premier.) Garage.
Richter Bros.—206 Grand St., Kansas City, Mo. (Moon.)
Rising & Co., C. E.—Park St., Portland, Me.
Rittenhouse Garage.—2: Philadelphia, Pa. (Am des.) Garage.
Ritter, J. F. Wm.—Young (Peerless, Packard.)
Rochester Garage.—Rochester
Rolls Royce Import Co.—1875 Bro New York City. (Rolls Royce.
Ross & Kramer.—5607 S. Halst., Chicago, Ill.

REPAIR SHOPS (Continued)

- Ross Motor Car Co., C. A.**—40 W. Main St., Little Falls, N. Y. Supplies; garage.
- Rounds, George E.**—Park Ave., opp. R. R. station, Plymouth, Mass. Garage.
- Rowland Motor Co.**—Chapel and Wallace Sts., New Haven, Conn.
- Rudolph, Wm. F.**—302 N. Broad St., Philadelphia, Pa.
- Russell & Hoague.**—425 E. Main St., Kalamazoo, Mich. Supplies; garage.
- Rutan & Co., P. C.**—46 Front St., Port Jervis, N. Y. (Pope-Hartford.) Garage.)
- Rutland Machine & Automobile Co.**—55-61 Wales St., Rutland, Vt. (Buick, Winton, Franklin.) Garage.
- Sague & Son, Horace.**—184-192 Church St., Poughkeepsie, N. Y. (Cadillac.) Supplies; garage.
- Sanger, Geo. T.**—206 W. Main St., Orange, Mass. (Waltham, Reo, Yale Motorcycles.) Garage.
- Schmidt Automobile Co.**—327 S. Gilbert St., Iowa City, Ia. Garage.
- Schroeder, H.**—229-231 W. Market St., York, Pa.; Main St., Shrewsbury, Pa. (Reo, Premier, Pullman.) Garage.
- Scott Motor Co., Geo. J.**—1720-22 Broadway, New York City. (Glide.) Garage.
- Scrivens' New Garage, C. L.**—13 Spring St., Ashtabula, O. (Buick, Cadillac.) Garage.
- Scull-Morris Motor Co.**—258 N. Broad St., Philadelphia, Pa. (Acme, Aero-car.)
- Selma Gun & Key Co.**—917 Water St., Selma, Ala. (Wayne, Pope-Hartford, Waltham, Mitchell.) Garage.
- Shaw Co., Walden W.**—1532-34 Michigan Ave., Chicago, Ill. (Berliet.) Garage.
- Shugert, G. S.**—247 Adams St., Rochester. (Northern, Rambler, Haynes.) Garage.
- Sid Black Automobile Co.**—630 Walnut St., Cincinnati, O. (Babcock, Lozier, Franklin, Thomas, Buick.) Supplies; garage; renting.
- Simmons, Bert R.**—310 Connolly St., Paris, Ill. (Waltham, Buick, Pope-Toledo.) Garage.
- Simpson, A.**—24 W. Mound St., Columbus, O.
- Sioux Falls Auto Supply Co.**—112-14 N. 1st Ave., Sioux Falls, S. D. (Jack-Rambler, Ford.) Garage.
- W.**—88-90 Bates St., Lewiston, Me. (Rambler, Ford.) Garage.
- W. R.**—306 W. 52d St., New York City.
- C.**—Blackhawk, Ind. (Wal-
- Garage & Repair Co., Geo.**—257 Union St., Olean, N. Y. Supplies; garage.

REPAIR SHOPS (Continued)

- South Broad Automobile Co.**—72 S. Broad St., Philadelphia, Pa. Garage; supplies. Renting, electric charging. (Dorris, Stevens-Duryea.)
- Southern Auto Co.**—1200 Mt. Royal Ave., Baltimore, Md. (Pierce Arrow.)
- Southworth Co., A. G.**—1733 Broadway, New York City; 342 Flatbush Ave., Brooklyn, N. Y. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
- Southern Garage Co.**—35-37 W. Mound St., Columbus O. (Buick.) Garage.
- Spalding & Bros., A. G.**—29 W. 42d St.; garage, 144 W. 50th St., New York City. (Stevens-Duryea.) Garage.
- Spangle, W. Judson.**—242 N. Broad St., Philadelphia, Pa. (Hotchkiss, Reo and Premier.)
- Speedway Garage.**—414 W. 155th St., New York City. Garage.
- Standard Auto Co.**—Woodward Ave., cor. Alexandrine, Detroit, Mich. (Packard, Oldsmobile.) Supplies.
- Standard Automobile Co.**—110 5th Ave., Clinton, Ia. (Moline.) Garage.
- Standard Auto Renting Co.**—186 E. 73d St., New York City. Renting; repairing.
- Stanhope Forge & Machine Works.**—27 Stanhope St., Boston, Mass.
- Star Electrical & Garage Co.**—609-13 French St., Erie, Pa. Supplies; garage.
- Stark Summit Auto Co.**—512 S. Arch Ave., Alliance, O. (Mitchell, Carter-car, Ford, Marvel.) Garage.
- Steele Mfg. Co.**—Gloversville, N. Y.
- Sterling Motor Car Co.**—180-184 Water St., Binghamton, N. Y. (Ford, Marmion, Jackson.) Garage.
- Stevens Co., E. A.**—Rear Fitchburg Hotel, Main St., Fitchburg, Mass. (Glide.) Garage.
- Stoltz, C. C.**—126-8 N. Prospect St., Marion, O. (Autocar, Buick.) Supplies; garage.
- Stone Automobile Co., Inc.**—1006 Main St., Stroudsburg, Pa. (Cadillac, Stevens-Duryea.) Garage.
- Strang, C. G.**—10 N. Nevada St., Colorado Springs, Colo. Garage.
- Stuart, J. H.**—McIndoe Falls, Vt. (Reo, Premier.) Garage.
- Stutsman & Co., C. B.**—Monte Vista, Colo. (Ford, Gale, Reliable, Dayton.) Garage.
- Swenson, Mrs. R. A.**—185 Prairie Ave., Providence, R. I. (Indian and Merkle Motorcycles.) Garage.
- Sutton, John W.**—Garages, 342-4 Flatbush Ave., 10-12 Clinton St., Brooklyn, N. Y.; electric battery station, 811-13 Union St., Brooklyn, N. Y. Supplies; garage.

REPAIR SHOPS (Continued)

- Tabor, J. W.**—201 E. 7th St., Los Angeles, Cal.
- Tampa Harness & Wagon Co.**—Tampa, Fla. (Pope-Toledo, Pope-Hartford, Pope-Waverley.) Garage.
- Tanberg Auto Co.**—River and Gibson Sts., Eau Claire, Wis. Garage. (White, Buick, Oldsmobile, Pope-Waverley.)
- Tarkio Electric & Water Co.**—Tarkio, Wis. (Pope-Waverley, Waltham.)
- Taylor Automobile Co., Inc.**—33-5 Orange St., Albany, N. Y. (Locomobile.) Garage.
- Thatcher & Sons.**—Mattoon, Ill.
- Throop, B. M.**—33 Walnut St., Geneva, Ohio.
- Times Square Automobile Co.**—1599-1601 Broadway, New York City. (Second-hand cars.) Garage.
- Titus, L. H.**—Glen St., Glen Cove, L. I., N. Y. Garage.
- Todd, James B.**—322 Peachtree St., Atlanta, Ga. (Stoddard-Dayton.) Garage.
- Tawle Co., E. H.**—25 W. Main St., Waterbury, Conn. (Locomobile, Franklin, Cadillac.) Supplies; garage.
- Trenery & Co., C. L.**—Block No. 4, Le Mars, Ia. (Gale, Queen, Oldsmobile.)
- Trowbridge, A.**—17 South St., Morristown, N. J. (Reo, Premier.) Garage.
- Troy Carriage Works.**—5th Ave. and Federal St., 745 3d Ave., Troy, N. Y. (Chadwick, Frayer-Miller, Baker, Mitchell.)
- Turnbull, G. A.**—Princeton, Ill. (Modeline.) Garage.
- Turner & Milnor.**—1532-4 Michigan Ave., Chicago, Ill.
- Twentieth Century Motor Car Co.**—121-125 S. Lafayette St., South Bend, Ind. (Buick.) Garage.
- Twenty-ninth St. Auto Station.**—95, 97 29th St., Chicago, Ill.
- Union Light & Power Co.**—St. Louis, Mo. (Rauch & Lang, Studebaker, Columbia.) Garage.
- United States Automobile Co.**—21-29 Plymouth Ave., near Main St., W., Rochester, N. Y. (Locomobile, Autocar, Stevens-Duryea, Pierce Arrow.) Supplies; garage.
- Updike, C. Ora.**—145 E. Main St., Lexington, Ky. (Rambler.) Supplies; garage.
- Utica Automobile Station.**—22-24 W. Utica St., Buffalo, N. Y. Garage; supplies.
- Utica Motor Car Co., The.**—333-5-7 Bleecker St., Utica, N. Y. (Buick, Peerless, Pierce Arrow, Thomas Flyer, Baker, Cadillac, Darrack.) Supplies; garage.

REPAIR SHOPS (Continued)

- Van Benschoten, John.**—14-20 Catherine St., Poughkeepsie, N. Y. (Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Lozier.) Supplies; garage.
- Vandecar, W. D.**—157 N. Ottawa St., Grand Rapids, Mich. (Reo, Glide.) Garage.
- Van Warts Garage.**—Palisade Ave., Englewood, N. J. (Reo, Maxwell, Studebaker, Crawford.) Garage.
- Victor Auto Storage Co.**—147 W. 55th St., New York City. Garage.
- Victor Auto Tire Repair Co.**—220 Madison Ave., Passaic, N. J.
- Von Hamm Young Co.**—Honolulu, Hawaiian Islands. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, White, Autocar, Maxwell.) Garage.
- Vrooman Bros.**—1259 State St., Schenectady, N. Y. (Elmore, Waltham.) Garage.
- Wallace Bros. Co.**—46-48 Main St., New Rochelle, N. Y. (Maxwell.) Supplies; garage.
- Waltham Mfg. Co.**—1615 Broadway, cor. 49th St., New York City. (Waltham. Touring Cars, Waltham Buckboards and Delivery Wagons.)
- Warfel & Arbuckle.**—1601 State St., Erie, Pa. (Waltham, Pope-Waverley.)
- Watch City Auto Garage.**—Rear Park Theatre, Elm St., Waltham, Mass.
- Waterville Market Co.**—White St., Waterville, N. Y. Garage.
- Webb & Son, W. H.**—316 State St., Connecticut, O. Garage.
- Welch Bros. Motor Car Co.**—Grand Ave., cor. 7th St., Milwaukee, Wis. (Locomobile, Packard, Pope-Hartford, Woods.) Garage; supplies.
- Welch Motor Car Co.**—1871-73 Broadway, New York City. Repairing Welch cars only. (Welch.)
- Wentworth Auto Station.**—Central Ave., Dover, N. H. (Reo, Premier, Wayne.) Garage.
- Westchester Motor Car Co.**—124-6 Main St., near Franklin Ave., New Rochelle, N. Y. Supplies; garage.
- Westerly Garage, The.**—88 Main St., Westerly, R. I. Garage; supplies.
- Western Automobile & Supply Co.**—211 S. Main St., Wichita, Kan.
- Western Motor Car Co.**—Los Angeles, Cal. Stevens-Duryea.
- West's Garage.**—Front St., Ballston Spa
- White Auto Repair**—St., New York City
- White Co., R.**—Road N. J. (White.)
- Wicke, J. A.**—Van Hook Garage.

REPAIR SHOPS (Continued)

- Wieder Harness Co.**—Calumet, Mich.
Wildern, George R.—Washington Ave., Charlotte, Mich.
Williams, Fred.—224 16th St., Denver, Colo.
Willys-Crew Motor Car Co.—117-19 Main St., Elmira, N. Y. (Rambler, White, Premier, Pope-Waverley, Ford, American.) Supplies; garage.
Willoughby, S. W.—27 W. Bridge St., Grand Rapids, Mich.
Winton Garage.—466 N. Clark St., Chicago, Ill.
Winton Motor Carriage Co.—246 Broad St., Philadelphia, Pa. (Winton.) Garage.
Wolf, M. L.—710 Gay St., Knoxville, Tenn. Garage.
Wolfe, W. H. & L. C.—1011 Chestnut St., Altoona, Pa. (Thomas, Winton, Studebaker, Pope-Toledo, Autocar, Buick.) Garage.
Wood Automobile Co., Frank B.—60-62 River St., Elgin, Ill. (Ford, Rambler, Kisselkar.) Garage.
Wood, J. Elmer.—Beverly, Mass. (Sterling.) Garage.
Woodward, Reopell Co.—Springfield, Mass. (Stoddard-Dayton.) Garage.
Wyckoff, Church & Partridge.—Broadway at 56th St., New York City. (C. G. V. Stearns.) Garage; supplies.
Xander Machine & Supply Co.—926 Bingham St., Reading, Pa. Garage.
Yonkers Auto Station.—71-73 S. Broadway, Yonkers, N. Y. Garage.
York County Garage.—Mechanic St., Sanford, Me. (Stevens-Duryea, Stanley, Cadillac, Buick.) Garage.
Youse, Ed. S.—46 N. 5th St., Reading, Pa. (Reo, Rambler, Premier.) Garage.
Zacharias, C. R.—Eagle Hall, Main St., cor. Sewell Ave., Asbury Park, N. J. Garage.

RESTS—FOOT.

- Appliance Mfg. Co.**—72-86 W. Jackson Bvd., Chicago, Ill.
Auto Rail & Equipment Co.—113 Michigan Trust Bldg., Grand Rapids, Mich.
Empire Gear & Top Co.—413 N. 22d St., Philadelphia, Pa.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Hume Carriage Co.—Amesbury, Mass.
Hillman Plating & Auto Supply Co.—446 Tremont St., Boston, Mass.
Manhattan Storage Co.—1611 Broadway, New York City.
New York Coach & Auto Lamp Co.—794-98 10th Ave., New York City.
Polson, W. F.—22 W. Utica St., Buffalo, N. Y.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.

RESTS—FOOT (Continued)

- Teel Mfg. Co.**—Medford, Mass.
Warner Pole & Top Co.—1655 Central Ave., Cincinnati, O.

RIMS—DETACHABLE.

- Cave Rims, Ltd.**—80 Ossory Road, Old Kent Road, London S. E., England.
Crescent Parts Co., The.—1743 Broadway, New York City.
Dunlop Rubber Co., Ltd.—Manor Mills, Birmingham, England.
Julien-Pinçon et Cie.—54 bvd. Magenta, Paris, France.
Landemard, Aubert, et Cie.—10 rue de Rambouillet, Paris, France.
Leger et Laillault.—15 rue de Corneille, Levallois, Seine, France.
Long & Mann Co.—Beehive Bldg., Graves St., Rochester, N. Y.
Maunier, M.—55 rue Picot, Toulon, France.
Presto Detachable Rim.—Lincoln Trust Bldg., Room 403, Jersey City, N. J.
Republic Rubber Co., The.—Youngstown, O.
Sadja, Jante Amovile.—31 quai de Suresnes, Suresnes, France.
Société des Jantes Amoviles, M. L.—52 Ave. Daumesnil, Paris, France.
Société d'Etude et d'exploitation pour l'Industrie Automobile.—45 boulevard Haussmann, Paris, France.
Société Française des Jantes Amoviles Bonhivers.—128 rue du Bois, Levallois, Seine, France.
Stier, L.—Villiers-sur-Marne, Seine-et-Oise, France.
Vinet Amovile La Jante.—2 Ave. de Messine, Paris, France.
Weiler, Ernst.—Blankenfelderstrasse 6, Berlin, Germany.

RIMS—METALLIC.

- American Tube & Stamping Co.**—Bridgeport, Conn.
Atwood & Co., F.—141 Saffron Hill, London E. C., England.
Bryant Steel Wheel & Rim Co.—454 Hayden Bank Bldg., Columbus, O.
Compagnie Française Westwood.—86 rue Engéne-Caron, Courbevoise, Seine, France.
Cramp, James.—85 Summer St. E., Boston, Mass.
Frank, Albert.—Beirerfeld, Germany.
Friedrichs und Engelking.—Brackwede, bei Bielefeld, Germany.
Goodyear Tire & Rubber Co.—Akron, O.
Guerin.—24 rue de Pantin, Bagnolet, Seine, France.
James, J. T.—Loveday St., Birmingham, England.
Jamesville Mfg. Co.—Jamesville, N. Y.
Jointless Rim Co., Ltd.—Long Acre, Birmingham, England.

RIMS—METALLIC (Continued)

- Kronprinz Aktiengesellschaft.**—Ohligs Germany.
Lombard Tube Co.—Birmingham, England.
Metallwerkegesellschaft Ohligs.—Ohligs, Germany.
Midgley Mfg. Co.—Columbus, O.
Monier, Seitert et Pommeret.—14 rue St. Maur, Paris, France.
Peugeot Frères.—296 Broadway. New York City.
Peugeot Frères, les fils de.—Valentigney, Doubs, France.
Piquera, J.—108 quai Jemappes, Paris, France.
Roman Rim Co.—Coventry, England
Société Anonyme des Tubes et Chassis Cloisonnés.—225 rue du Vieux-Pont-de-Sevres, Billancourt, Seine, France.
Standard Welding Co., The.—Cleveland, Ohio.
Usines de Sainte-Marie et Gravigny, Société Anonyme des Gravigny.—Eure, France.
Weston Mott Co.—Flint, Mich.
Westwood Tire & Rim Co., Ltd.—89 Station St., Birmingham, England.

RIMS—WOOD.

- American Wood Rim Co.**—Bradford, Pa.
Chicot, S.—78 rue des Arts, Levallois, Seine, France.
Crane & MacMahon.—8 Bridge St., New York City.
Duvinage, Camille.—232 rue des Longues-Haies, Roubaix, France.
Glassner, Martin.—Ratibor, Germany.
Hagerstown Spoke & Bending Co.—Hagerstown, Ind.
Hannoverische Holzbearbeitung und Wagonfabriken.—Linden, Hanover, Germany.
Jones, Phineas, & Co.—30 Market St., Newark, N. J.
Morin, Veuve.—Mohon, Ardennes, France.
Neveu, J., et Cie.—169 ave. du Roule, Neuilly-sur-Seine, France.
Rastetter & Son, Louis.—Fort Wayne, Ind.
Vinet et Boulogne.—61 rue de Villiers, Seine, France.

RINGS—PISTON.

- Ferro Machine & Foundry Co.**—115 Wade Bldg., Cleveland, O.
Jorden, R. H.—110 Sheridan St., Allegheny, Pa.
Spacke Mach. Co., The F. W. S.—Indianapolis, Ind.

ROBES—AUTO.

- American Buffalo Robe Co.**—Buffalo, N. Y.
Bishop & Co., The J. H.—Wyandotte, Mich.

ROBES—AUTOMOBILE (Continued)

- Chase & Co., L. C.**—Boston, Mass.
Chicago Auto Robe Supply Co.—159 Market St., Chicago, Ill.
Crosby, Frisian Fur Co.—116 Mill St., Rochester, N. Y.
Davis Robe Co., Inc.—1307 Champion Bldg., Chicago, Ill.
Draper Bros. & Co.—Canton, Mass.
Dusenbury, Louis.—86-88 Worth St., New York City.
Gausler & Starr.—Philadelphia, Pa.
Hopewell Bros.—42 Osborn St., Cambridge, Mass.
Laidlaw, Wm. R., Jr.—1771 Broadway, New York City.
Moore Smith Co.—Boston, Mass.
Morawetz Co.—Milwaukee, Wis.
National Casket Co.—New York City. Boston, Philadelphia, Baltimore, Pittsburgh, Louisville, Indianapolis, Rochester, Buffalo, Nashville, Albany and Chicago.
Parsons Buggy Top Co.—Chicago, Ill.
Pioneer Woolen Mills.—1120 Beaufait St., Detroit, Mich.
Revillon Frères.—15 W. 28th St., New York City.
Riley & Son, Wm. B.—324-26 Market St., Philadelphia, Pa.
Rogers, Peet & Co.—258, 842 and 1260 Broadway (3 stores), New York City.
Saks & Co.—Broadway, 33d to 34th Sts., New York City.
Scandinavian Fur & Leather Co.—New York City.
Spear Martin Fur Co.—41 Church St., Burlington, Vt.
Stall & Dean Mfg. Co.—Brockton, Mass.
Vehicle Apron & Hood Co.—Columbus, Ohio.
Wallace Co., Hugh.—Boulevard and Orleans St., Detroit, Mich.
Winship, W. W.—71 Summer St., and 11 Kingston St., Boston, Mass.

RODS—CONNECTING.

- American & British Mfg. Co.**—Bridgeport, Conn.
Anderson Forge & Machine Co.—Detroit, Mich.
Erie Forge Co.—Erie, Pa.
Funk Engineering Co.—39-45 14th St., Hoboken, N. J.
Gill & Sons Forge & Machir H.—Brooklyn, N. Y.
Richmond Forgings Corp.—Richmond, Va.
Spacke Mach. Co., The F. W.—Indianapolis, Ind.
Standard Connecting Rod—Falls, Pa.
Wyman & Gordon.—30 Bra. Worcester, Mass.

SCREW MACHINE PRODUCTS.

Blake & Johnson.—Waterbury, Conn.
Chicago Screw Co.—2 N. Canal St., Chicago, Ill.
Columbus Screw & Machine Co.—Columbus, O.
Detroit Screw Works.—Riopelle and Franklin Sts., Detroit, Mich.
Dover Co., Geo. W.—80 Clifford St., Providence, R. I.
Eclipse Machine Co.—Elmira, N. Y.
Elyria Machine Parts Co., The.—Elyria, Ohio.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Hill Co., Geo. Q.—326 A St., Boston, Mass.
Holt & Co., W. H.—95 Pine St., Providence, R. I.
Lippincott Steam Specialty & Supply Co.—Newark, N. J.
Machinery Forging Co.—Hamilton and Marquette Sts., Cleveland, O.
Mack Mfg. Co., Thos. A.—401-417 St. Paul Ave., Jersey City, N. J.
McCord & Co.—1400 Old Colony Bldg., Chicago, Ill.
McKeel & Co., Geo. A.—Jackson, Mich.
Metal Specialties Mfg. Co.—14-24 W. Randolph St., Chicago, Ill.
Meyer & Co., John C.—Bolyston and Bismarck Sts., Jamaica Plain, Mass.
National-Acme Mfg. Co., The.—Stanton Ave. S. E. and E. 75th St., Cleveland, Ohio.
National Cycle Mfg. Co.—Bay City, Mich.
Niles-Bement-Pond Co.—111 Broadway, New York City.
Peninsular Milled Screw Co.—751 Bellevue Ave., Detroit, Mich.
Western Instrument Co.—18-20 W. Randolph St., Chicago, Ill.
Worcester Machine Screw Co.—Worcester, Mass.

SCREWS.

Atlas Bolt & Screw Co., The.—Cleveland, Ohio.
Blake & Johnson.—Waterbury, Conn.
Clark Bros. Bolt Co.—Milldale, Conn.
Cleveland Cap Screw Co.—2216 Clarkwood Road, Cleveland, O.
Corbin, Screw Co., The.—New Britain, Conn.
Cutshley Machine Screw Co.—25 Union St., Worcester, Mass.
Bit Screw Works.—Riopelle and Franklin Sts., Detroit, Mich.
pse Machine Co.—Elmira, N. Y.
Cap & Set Screw Co.—2151 Scrantom Road, Cleveland, O.
ord Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Co., Geo. Q.—326 A St., Boston, Mass.

SCREWS (Continued)

Holt & Co., W. H.—95 Pine St., Providence, R. I.
Kirk-Latty Co.—Cleveland, O.
National Cycle Mfg. Co.—Bay City, Mich.
National Screw & Tack Co.—Cleveland, Ohio.
National Sewing Machine Co.—Belvidere, Ill.
Peninsular Milled Screw Co.—751 Bellevue Ave., Detroit, Mich.
Union Steel Screw Co.—Cleveland, O.
Waterbury, Mfg. Co.—Waterbury, Conn.
Western Automatic Machine Screw Co., The.—Elyria, O.

SEATS.

Amesbury Brass & Foundry Co.—Amesbury, Mass.
Connecticut Steel & Wire Co.—308 Pearl St., Hartford, Conn.
Coops Co., C. W.—3 Appleton St., Boston, Mass.
Crescent Auto Top Co.—58 W. 43d St., New York City.
Dann Bros. & Co., The.—8 Franklin St., New Haven, Conn.
Empire Gear & Top Co.—413 N. 22d St., Philadelphia, Pa.
Fellwock Automobile & Mfg. Co.—Evansville, Ind.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Hume Carriage Co.—Amesbury, Mass.
Indianapolis Dash Co.—Indianapolis, Ind.
Ithaca Carriage Co.—Ithaca, N. Y.
Metal Stamping Co.—243 West St., New York City.
Miller & Co., A. J.—Bellfontaine, O.
Motor Accessories Co.—14 Dutch St., New York City.
Ohio Blower Co., The.—330 Prospect Ave. N. W., Cleveland, O.
Union City Body Co.—W. Pearl St., Union City, Ind.
Whipple, R. W.—169 State St., Binghamton, N. Y.

SEATS—REMOVABLE.

Anderson & Co., F. W.—429 S. Broad St., 757 N. Uber St., factory, Philadelphia, Pa.
Dayton Folding Tonneau Co.—1141 N. Main St., Dayton, O.
Graves & Congdon Co.—Oak St., Amesbury, Mass.
Hill Mfg. Co.—25-27 Fuller St., Buffalo, N. Y.
Schubert Bros. Gear Co.—42-44 Cedar St., Oneida, N. Y.
Stratton Carriage Body Co.—Muncie, Ind.

SHAFTING.

American Roller Bearing Co.—Tripp St., South Framingham, Mass.
American Steel & Wire Co.—The Rookery, Chicago, Ill.
Cleveland Cap Screw Co.—2216 Clarkwood Road, Cleveland, O.
Columbia Bridge Co.—Pittsburg, Pa.
Cumberland Steel Co.—Williams St. and Baltimore and Ohio R. R., Cumberland, Md.
Long Arm System Co.—Lakeside Ave. and E. 38th St., Cleveland, O.
Wilmarth & Morman Co.—585 Canal St., Grand Rapids, Mich.

SHAFTING—FLEXIBLE.

Cincinnati Electric Tool Co., The.—650-52 Evans St., Cincinnati, O.
Coates Clipper Mfg. Co.—Worcester, Mass.
Gem Mfg. Co.—Spruce, near 33d St., Pittsburg, Pa.
Stow Flexible Shaft Co.—Philadelphia, Pa.
Webb Mfg. Co.—60 Shipman St., Newark, N. J.
White Dental Mfg. Co.—Philadelphia, Pa.

SHAFTS—CRANK.

Anderson Forge & Machine Co.—Detroit, Mich.
American & British Mfg. Co.—Bridgeport, Conn.
Atlas Drop Forge Co.—Lansing, Mich.
Atlas Mfg. Co.—Hampton, N. H.
Bates Forge Co.—227 W. Merrill St., Indianapolis, Ind.
Cambria Forge Co.—Cleveland, O., and Johnstown, Pa.
Carpenter Steel Co.—Reading, Pa.
Chester Forging & Engineering Co., The.—Broad and Crosby Sts., Chester, Pa.
Dixon Crucible Co., Jos.—Jersey City, N. J.
Erie Forge Co.—Erie, Pa.
Funk Engineering Co.—39-45 14th St., Hoboken, N. J.
Gill & Sons Forge & Machine Works, P. H.—Brooklyn, N. Y.
Leland & Co., W. H.—Southbridge St. and Hope Ave., Worcester, Mass.
New England Forge Co.—9 Plymouth St., Worcester, Mass.
Norton Grinding Co.—Worcester, Mass.
Richmond Forgings Corp.—Belle Isle, Richmond, Va.
Standard Connecting Rod Co.—Beaver Falls, Pa.
Tindel-Morris Co.—Eddystone, Pa.
Williams & Co., J. H.—Brooklyn, N. Y.
Worcester Steel Foundry Co.—Millbury, Mass.
Wyman & Gordon.—30 Bradley St., Worcester, Mass.

SHELLS—BOILER.

Crosby Co.—Buffalo, N. Y.
Hungerford Brass & Copper Co.—New York City.
Randolph-Clowes Co.—Waterbury, Conn.
Pressed Steel Tank Co.—Milwaukee, Wis.
Western Drop Forge Co.—Marion, Ind.

SHIELDS—EYE.

American Thermo Ware Co.—16 Warren St., New York City.
Arnstein, Eugene.—45th and Shields Ave., Chicago, Ill.
Automobile Supply Mfg. Co.—139-147 Emerson Pl., Brooklyn, N. Y.
Betzin und Werner.—Berlin Germany.
Blackham & Son.—30 High St., Coventry, England.
Chicago Eye Shield Co.—143-7 S. Clinton St., Chicago, Ill.
Cottet Frères.—11 quai de l'Hopital, Morez, Jura, France.
Crétin - Billet Frères.—Morez - du - Jura France.
Doninelli, Victor.—15 rue de la Gare, Nice, France.
Dratz.—21 rue de l'Hopital, Brussels, Belgium.
Dunhill, Alfred, Ltd.—Euston Road, London, England.
Ehrlich & Son, J.—1345 Broadway, New York City.
Flammer, L.—28 rue des Prairies, Paris, France.
Friedlander & Bro., Joseph.—8 Maiden Lane, New York City.
Garnage, Ltd.—Holborn, London, E. C., England.
Globe Optical Co.—403 Washington St., Boston, Mass.
Gross, Martin.—41 Louisenstrasse, Berlin, Germany.
Humbert, C.—12 rue des Solitaires, Paris, France.
Jacquemin, J. B.—Route de la Mouille, Morez, Jura, France.
Jacquemin et Cie.—Morez, Jura, France.
Jeantet, Eugene.—238 Grande Rue, Morez, Jura, France.
King Optical Co., Julius.—10-12 Maiden Lane, New York City; State and Madison Sts., Chicago, Ill.; Erie and Sheriff Sts., Cleveland, O.
Leng's Son & Co., John S.—33 Murray St., New York City.
L a c r o i x-Chevassu, J.—Morez, Jura, France.
Lamy Jeune et fils.—Morez, Jura, France.
Lloyd & Co., A. J.—323 Washington St., Boston, Mass.
Lournier, les fils de.—Morez, Jura, France.
Merz Frères.—139 fauborg St. Denis, Paris, France.
Meyrowitz Mfg. Co., Inc.—104 E. 23rd St., New York City.

SHIELDS—EYE (Continued)

- Merz, Gebrüder.**—25 Weingarten, Frankfurt-Bockenheim, Germany.
Mills Mfg. Co.—1368-70 Broadway, New York City.
Motor Car Supply Co., The.—1425-27 Michigan Ave., Chicago, Ill.
Munsell & Co., Eugene.—218 Water St., New York City.
Mutual Auto Accessories Co., The.—1937 Broadway, New York City.
North Carolina Mica Co.—95 Blackstone St., Boston, Mass.
Oelschläger Bros.—42 E. 23rd St., New York City.
Ophthalmoscope Co.—Toledo, O.
Piggott, John, Ltd.—Milk St., Cheapside, London, England.
Rogers, Peet & Co.—258-842-1260 Broadway, 3 Stores, New York City.
Scheidig & Co., John.—50 Maiden Lane, New York City.
Schusser, Franz.—Fürth, Germany.
Schopflochen, Ludwig.—Fürth, Germany.
Spencer Optical Mfg. Co.—15 Maiden Lane, New York City.
Sorge und Sabeck.—86 Mauerstrasse, Berlin, W., Germany.
Sussfield, Lorsch & Co.—37 Maiden Lane, New York City.
Texas Co., The.—Chicago, Ill.
United Motor Industries, Ltd.—Sherbourne Works, Coventry, England.
Waterson, H. and Sons.—67 Albert Road, Aston, Birmingham, England.

SHIELDS—WIND

- Adapt Machinery Co.**—1624-34 Wabash Ave., Chicago, Ill.
American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill.
Auto Equipment Co., The.—1424-26 Michigan Ave., Chicago, Ill.
Banker Bros. Co.—Baum and Beatty Sts., Pittsburg, Pa.
Barndt-Johnson Auto Supply Co., The.—422 Donaldson St., Columbus, O.
Blaiser Mfg. Co., M. E.—Utica, N. Y.
Bridgeport Vehicle Co.—Water and South Sts., Bridgeport, Conn.
Buffalo Auto Body & Trimming Co.—338 Ellicott St., Buffalo, N. Y.
Buob & Scheu.—408 E. Court St., Cincinnati, O.
Capital Auto Co.—Indianapolis, Ind.
Carter Chapman & Co.—Ludington.

- Limousine & Carriage Co.**—1223 W. 35th Ave., Chicago, Ill.
Linsley Mfg. Co.—50 W. 67th St., New York City.
Motor Car Co., The.—Paterson, N. J.
Motor Top Co.—58 W. 43rd St., New York City.
Parsons Buggy Top Co.—Chicago, Ill.
W. J.—304 W. 54th St., New York City.

SHIELDS—WIND (Continued)

- Empire Gear & Top Co.**—413 N. 22nd St., Philadelphia, Pa.
Fellwock Automobile & Mfg. Co.—Evansville, Ind.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Hartford Auto Body Works.—809 Asylum Ave., Hartford, Conn.
Hill Mfg. Co.—25-27 Fuller St., Buffalo, N. Y.
Knight & Co., D. C.—1725 Michigan Ave., Chicago, Ill.
Limousine & Carriage Mfg. Co.—35th St. and Michigan Ave., Chicago, Ill.
London Auto Supply Co., The.—1229-31 Michigan Ave., Chicago, Ill.
Manhattan Auto Top and Body Co.—249 W. 64th St., New York City.
Meyer, Morris F.—65-69 E. Woodbridge St., Detroit, Mich.
Michigan Top Co.—17 Duffield St., Detroit, Mich.
Millwood Mfg. Co.—55th St. and S. Park Ave., Chicago, Ill.
Motor Top Co. of New York.—216 W. 50th St., New York City.
National Auto Top Co.—Main Office, 1904 Broadway; Factory, 244-50 W. 49th St., New York City.
New England Auto Top Co.—229 W. 54th St., New York City.
Nolan, Wm.—541 Tremont St., Boston, Mass.
Off & Co., Christian.—Indianapolis, Ind.
Parsons Buggy Top Co.—Chicago, Ill.
Pierser & Wood.—3838 Vernon Ave., Chicago, Ill.
Polson, W. F.—22 W. Utica St., Buffalo, N. Y.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Ritter Mfg. Co.—242 Jefferson Ave., Detroit, Mich.
Ross, H. S.—5607 S. Halsted St., Chicago, Ill.
Sprague Umbrella Co.—Norwalk, Conn.
Victor Factories, The.—Broadway and 65th St., New York City.

SHOES—TIRE

- Adwear Auto Tire Sleeve Co.**—High and Washington Sts., N. Attleboro, Mass.
Akron Pneumatic Tire & Protector Co.—Akron, O.
American Anti-Puncture Tire & Auto Co.—1693 Broadway, New York City.
Chicago Rawhide Mfg. Co.—75-77 Ohio St., Chicago, Ill.
Grinard Inserted Leather Auto Shoe Co.—Buffalo, N. Y.
Howard Mfg. Co.—Attleboro, Mass.
Humphreys, J.—4038 Payne Ave., Cleveland, O.
Inner Shoe Tire Co.—64 Monroe St., Grand Rapids, Mich.

SHOES—TIRE (Continued)

- Kimball Tire Case Co.**—Council Bluffs, Ia.
Leather Tire Goods Co.—1325 Boylston St., Newton Upper Falls, Mass.
Manning Mfg. Co.—Holyoke, Mass.
More-Power Co.—919 Gorham St., Lowell, Mass.
New York Sporting Goods Co.—17 Warren St., New York City.
Norris Auto Co.—Genesee Ave., Saginaw, Mich.
Pneumatic Tire Protector Co.—14-16 S. St. Clair St., Dayton, O.
Vehicle Apron & Hood Co.—Columbus, O.

SOAPS—HAND

- Automobile Equipment Co.**—264 Jefferson Ave., Detroit, Mich.
Automobile Supply Co., The.—1339 Michigan Ave., Chicago, Ill.
Auto Oil Co.—Jackson, Mich.
Badger Chemical Mfg. Co.—143 Reede St., Milwaukee, Wis.
Baum's Castorine Co.—140 W. George St., Rome, N. Y.
Beckley-Ralston Co.—80-84 Michigan Ave., Chicago, Ill.
Cross, W. H.—18-20 Franklin St., Boston, Mass.
Ericka Mfg. Co., Inc.—Springfield, Mass.
Motor Car Supply Co., The.—1425-27 Michigan Ave., Chicago, Ill.
Mutual Auto Accessories Co., The.—1937 Broadway, New York City.
Fisk Mfg. Co.—Walker St., Springfield, Mass.
Franco-American Auto & Supply Co.—1404-06 Michigan Ave., Chicago, Ill.
Jergens Co., Andrew.—Cincinnati, O.
Kirk & Co., J. S.—360 N. Water St., Chicago, Ill.
New York Sporting Goods Co.—17 Warren St., New York City.
Rome Soap Mfg. Co.—Rome, N. Y.
Skat Mfg. Co.—791 Part St., Hartford, Conn.
Stanley, J. T.—650 W. 30th St., New York City.
Utility Co., The.—233 Greenwich St., New York City.
Waltke & Co., Wm.—Grand and Second Sts., St. Louis, Mo.
White & Bagley Co., The.—100 Foster St., Worcester, Mass.

SOAPS AND POLISHES—AUTOMOBILE BODY

- Acme Oil & Supply Co.**—345 S. Canal St., Chicago, Ill.

SOAPS AND POLISHES—AUTOMOBILE BODY (Continued)

- Adams & Elting Co.**—155 W. Washington St., Chicago, Ill.
Annis Oil Co., N. L.—139 Potomac Ave., Buffalo, N. Y.
Automobile Equipment Co.—264 Jefferson Ave., Detroit, Mich.
Automobile Supply Co., The.—1339 Michigan Ave., Chicago, Ill.
Auto Oil Co.—Jackson, Mich.
Beckley-Ralston Co.—80-84 Michigan Ave., Chicago, Ill.
Buffalo Specialty Co.—3751-77 Ellicott Sq., Buffalo, N. Y.
Cleanola Co.—Fulton Bldg., Pittsburg, Pa.
Eagle Mfg. Co.—383 Prospect St., Cleveland, O.
Fairchild & Bros., M. H.—119 Michigan St., Chicago, Ill.
Flash Chemical Specialty Co.—7-9 Fulton Place, Buffalo, N. Y.
Franco-American Auto & Supply Co.—1404-06 Michigan Ave., Chicago, Ill.
Hollingshead Co., R. M.—Camden, N. J.
Hydro-Palm Soap Co.—22 Minot St., Boston, Neponset District, Mass.
Kirk & Co., J. S.—360 N. Water St., Chicago, Ill.
Klenzene Co.—1710 Market St., Philadelphia, Pa.
Leader Mfg. Co.—1808 Chestnut St., St. Louis, Mo.
Liberty Association.—12 State St., Chicago, Ill.
Lucas & Co., John.—Philadelphia, Pa.
Magie Bros.—9-11 N. Canal St., Chicago, Ill.
Modoc Co.—Foot of Market St., Chester, Pa.
Monahan Antiseptic Co.—92 Market St., Chicago, Ill.
Motor Car Supply Co., The.—1425-27 Michigan Ave., Chicago, Ill.
Mutual Auto Accessories Co., The.—1937 Broadway, New York City.
Newburn Co., S. C.—430 Walnut St., Philadelphia, Pa.
New York Sporting Goods Co.—17 Warren St., New York City.
Puritan Soap Co.—Rochester, N.
Royal Lubricat—St., New Y
Royal Polish—Chicago, Ill.
Sheppard, W.—ark, N. J.
Speare's Sons—Atlantic Ave., Boston, Mass.

SOAPS AND POLISHES—AUTOMOBILE BODY (Continued)

- Stanley, J. T.**—650 W. 30th St., New York City.
Sweet, Charles F.—61 Market St., Hartford, Conn.
White & Bagley Co., The.—100 Foster St., Worcester, Mass.
Young, Orlando W.—180 Freylinghuysen Ave., Newark, N. J.

SOCKETS—BOW

- Ashtabula Carriage-Bow Co.**—99 Prospect St., Ashtabula, O.
Cortland Carriage Goods Co.—Cortland, N. Y.
Cortland Forging Co.—Cortland, N. Y.
Crandall Stone & Co.—Binghamton, N. Y.
Limousine & Carriage Mfg. Co.—35th St. and Michigan Ave., Chicago, Ill.
Metal Stamping Co.—243 West St., New York City.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Scherer & Co., H.—Detroit, Mich.

SOLDER

- Columbia Smelting & Refining Co.**—365-367 West St., New York City.
Electrical & Mechanical Development Co.—Asbury Park, N. J.
Gardiner Metal Co.—454-56 W. Lake St., Chicago, Ill.
Grout Bros. Automobile Co.—Orange, Mass.
Lumen Bearing Co.—Syracuse St. and Belt Line, Buffalo, N. Y.
Solderine Co.—53 State St., Boston, Mass.
Syracuse Smelting Works.—36th St. and 10th Ave., New York City.
Taylor Co., N. & G.—308 Chestnut St., Philadelphia, Pa.
Wildes, Thomas.—246 Water St., New York City.

SOLDER—ALUMINUM

- Aluminum Solder & Refining Co.**—Oswego, N. Y.
Clum & Atkinson.—575 Lyell Ave., Rochester, N. Y.
Grout Bros. Automobile Co.—Orange, Mass.
Lester & Co., E. F.—Fayetteville, N. Y.
Lumen Bearing Co.—Sycamore St. and Belt Line, Buffalo, N. Y.
Solderine Co.—53 State St., Boston, Mass.
United States Bronze Co.—149 Columbus St., Cleveland, O.

SOLDER—SILVER

- United Wire & Supply Co.**—109-19 Summer St., Providence, R. I.

SPEEDOMETERS, see INDICATORS, SPEED

SPOKES—WOOD

- Crane & MacMahon.**—8 Bridge St., New York City.

SPRAGS—BRAKE

- Youse, E. S.**—46 N. 5th St., Reading, Pa.

SPRING-REPAIRERS

- Auto Spring Repairer Co.**—54 Maiden Lane, New York City.
Emergency Spring Repairer Co.—80 Broad St., New York City.

SPRINGS—COIL

- American Steel & Wire Co.**—The Rookery, Chicago, Ill.
Bowers Metal Stamping Co.—718 E. 11th St., New York City.
Cary Spring Works.—240-42 W. 29th St., New York City.
Cleveland Wire Spring Co.—Cleveland O.
Dunbar Bros.—Bristol, Conn.
Eureka Spring Co.—347 Broadway, New York City.
Gibson Co., Wm. D.—Huron and Kingsbury St., Chicago, Ill.
Hebb, George A.—70 Williams St., Newark, N. J.
Hubbard Spring Co., M. D.—Pontiac, Mich.
Independent Steel & Wire Co.—House St., Chicago, Ill.
Miller & Van Winkle.—18 Bridge St., Brooklyn, N. Y.
Morgan Spring Co.—Worcester, Mass.
National Cutlery Co.—Detroit, Mich.
Raymond Mfg. Co.—Corry, Pa.
Thompson, F. H.—36-38 Elm St., Portland, Me.
Wallace Barnes Co., The.—Bristol Conn.

SPRINGS—CUSHION

- Auxiliary Spring & Ventilating Co.**—Button St., Detroit, Mich.
Barber Mfg. Co.—Anderson, Ind.
Cleveland Wire Spring Co.—Cleveland, O.
D'Arcy Spring Co.—Kalamazoo, Mich.
Detroit Wire Spring Co.—Detroit, Mich.
Hubbard Spring Co., M. D.—Pontiac, Mich.
Independent Steel & Wire Co.—House St., Chicago, Ill.
Kalamazoo Spring & Axle Co.—Kalamazoo, Mich.
Kelley & Co., E.—509 Main St., Worcester, Mass.
National Spring & Wire Co.—Albion, Mich.
New York Wire & Spring Co.—Hoboken, N. J.
Spring Perch Co.—232 John St., Bridgeport, Conn.
Staples & Hanford.—Newburgh, N. Y.

SPRINGS—CUSHION (Continued)

- Ventilated Cushion & Spring Co.**—Jackson, Mich.
Wallace Barnes Co., The.—Bristol, Conn.
Windsor Spring Co., The.—Kenosha, Wis.
Wing & Co., Charles.—Amesbury, Mass.

SPRINGS—LEAF

- Adapt Machinery Co.**—1624-34 Wabash Ave., Chicago, Ill.
Albany Mfg. Co., Ltd.—Cumberland Park, Willesden Junction, London, England.
Ansted Spring & Axle Co.—Connersville, Ind.
Armstrong Mfg. Co., The J. B.—Flint, Mich.
Baldauf, C. G.—Limbacherstrasse 37, Chemnitz, Germany.
Cleveland Canton Spring Co., The.—Canton, O.
Comptoir des Ressorts de Carrosserie, Société Anonyme.—80 rue Taitbout, Paris, France.
Delaney & Son, D.—Liberty and Hamilton Sts., Newark, N. J.
Detroit Steel Product Co.—91 E. Fort St., Detroit, Mich.
Dittman und Neuhaus.—Witten, Germany.
Dorflingeresche Achsen und Federnfabrik Actiengesellschaft.—Mannheim, Germany.
Engelmann, Paul.—Delitzscherstrasse 15, Leipzig-Eutritzsch, Germany.
Forest City Spring Works.—Cleveland, O.
Garden City Spring Works.—2000 Purple St., Chicago, Ill.
Gibson Co., Wm. D.—Huron and Kingsbury Sts., Chicago, Ill.
Gouvy et Cie.—Oberhombourg, Lorraine, Germany.
Hannoyer et fils.—39 rue Fouquet, Levallois-Perret, France.
Harvey Spring Co.—Racine, Wis.
Hebb, George A.—70 William St., Newark, N. J.
Hess Pontiac Spring & Axle Co.—Pontiac, Mich.
Kalamazoo Spring & Axle Co.—Kalamazoo, Mich.
Keystone Spring Works, Inc.—13th and Buttonwood Sts., Philadelphia, Pa.
Lemoine.—Ivry, Seine, France.
Lewis Spring & Axle Co.—Jackson, Mich.
Merrill Spring Co., E. R.—530 W. 28th St., New York City.
Muneaux, Ed.—7 rue Marivaux, Paris, France.
Pelgrims, Forges et Ateliers de Construction R.—145 rue Neuve, Brussels, Belgium.
Penn Spring Works.—Baldwinsville, N. Y.

SPRINGS—LEAF (Continued)

- Perfection Spring Co.**—2414-20 Superior Ave., N. W., Cleveland, O.
Poldi, Acieres.—56 ave Parmentier, Paris, France.
Potron, Em.—29 rue Riquet, Paris, France.
Richards and Co., Jos.—Spring Hill, Birmingham, England.
Rowlands & Harvey, Wm.—Frankford, Philadelphia, Pa.
Schulz und Hesse.—Rummelsburg, Berlin, Germany.
Sheldon Axle Co.—Wilkesbarre, Pa.
Shuler, Davis & Son, W.—Amsterdam, N. Y.
Smith, Parfrey & Co., Ltd.—Rannoch St., Fulham Palace Road, Hammer-smith, London, England.
Société des Usines des Ressorts du Nord.—10 rue St-Vaast, Donai, France.
Taylor Gue, Ltd.—84 Peel St., Birmingham, England.
Thomas Auguste, et Cie.—58 quai des Charbonnages, Brussels, Belgium.
Troy Spring Works.—394-96 Congress St., Troy, N. Y.
Tuthill Spring Co.—215 W. Polk St., Chicago, Ill.
Vermot, Ch.—Chatenois, Haut-Rhin, France.
Waugh, Milton T.—1525 Monadnock Blk., Chicago, Ill.

SPRINGS, SUPPLEMENTARY, see ABSORBERS, SHOCK

SPROCKETS

- Baldwin Chain & Mfg. Co.**—199 Chandler St., Worcester, Mass.
Boston Gear Works.—Norfolk Downs, Mass.
Bultman Co., The F. H.—2108 Superior Avenue Viaduct, Cleveland, O.
Collmer Bros.—105 Vistula Ave., South Bend, Ind.
Cushman Wheel Co.—1030 Dunning St., Chicago, Ill.
Forg, Peter.—Park St., Somerville, Mass.
Garford Co., The.—Elyria, O.
Grant Gear Works.—6 Portland St., Boston, Mass.
Hydraulic Pressed Steel Co.—E. 61st St., Cleveland, O.
Parish & Bingham Co.—Cleveland, O.
Spache Mach. Co., The F. W.—Indianapolis, Ind.
Throop Perforating—Buffalo, N. Y.

STAMPINGS—M.

- Avery Stamping Co.**—5 Ave., N. E., Cleveland, C
A. Z. Co., The.—527 W. 1 York City.
Bay State Stamping Co.—380 (St., Worcester, Mass.

STAMPINGS—METAL (Continued)

Boston Pressed Metal Co.—171-173 Union St., Worcester, Mass.
Cassady Fairbank Mfg. Co.—6106-30 La Salle St., Chicago, Ill.
Crispin Sheet Steel Metal Mfg. Co.—3038-46 Chestnut St., Philadelphia, Pa.
Crosby Co.—Buffalo, N. Y.
Douglass & Lomason Co.—302-10 Grand River Ave., Detroit, Mich.
Forg, Peter.—Park St., Somerville, Mass.
Forsythe Mfg. Co.—308 Terrace, Buffalo, N. Y.
Globe Machine & Stamping Co.—3868 Hamilton Ave., N. E., Cleveland, O.
Hall Co., Chas. E.—108 Broadway, Buffalo, N. Y.
Hancock Inspirator Co.—85 Liberty St., New York City.
Hatcher Auto Parts Co.—2108 Superior Ave., Cleveland, O.
Hill Co., Geo. Q.—326 A St., Boston, Mass.
Hydraulic Pressed Steel Co.—E. 61st St., Cleveland, O.
Indestructible Steel Wheel Co.—1303 Michigan Ave., Chicago, Ill.
Janney Steinmetz & Co.—Fourth and Market Sts., Philadelphia, Pa.
Keim Mills Inc., John R.—Kensington Ave. and Erie Tracks, Buffalo, N. Y.
Kinsey Mfg. Co.—Dayton, O.
Konigslow Mfg. Co., Otto.—2279 Clarkwood Road, Cleveland, O.
Mack Mfg. Co., Thos. A.—401-417 St. Paul Ave., Jersey City, N. J.
Matthews Mfg. Co., H. A.—Seymour, Conn.
McKeel, Geo. A.—Jackson, Mich.
Metal Specialties Mfg. Co.—14-24 W. Randolph St., Chicago, Ill.
Mossberg Co., Frank.—S. Mann and Mill Sts., Attleboro, Mass.
Nortmann-Duffke Foundry Co.—26th St. and Layton Ave., Milwaukee, Wis.
Parish & Bingham Co.—Cleveland, O.
Parish Mfg. Co.—7th and Chestnut Sts., Reading, Pa.
Pittsburg Gauge & Supply Co.—309 Water St., Pittsburg, Pa.
Regester's Sons & Co., J.—Holliday and Saratoga Sts., Baltimore, Md.
Schrader's Sons, A.—32 Rose St., New York City.
Sidney Mfg. Co.—5300 Armour Ave., Chicago, Ill.
Smith Co., John.—104-10 Centre St., Newark City.
Stamps & Stencils Co.—132 Bissell St., Syracuse, N. Y.
Steel Mfg. Co.—Industrial Bldg., Syracuse, N. Y.
Steele Mfg. Co.—108-14 E. Dedham St., Boston, Mass.
Steele Instrument Co.—18-20 Randolph St., Chicago, Ill.

STAMPINGS—METAL (Continued)

Worcester Pressed Steel Co.—North and Barber Aves., Worcester, Mass.

STAMPS AND STENCILS

Monogram Crest & Sign Co.—125 E. 86th St., New York City.
Murdock Co., James Jr.—116 Opera Pl., Cincinnati, O.
New York Stencil Works.—100 Nassau St., New York City.
Quint & Sons, S. H.—15 S. 4th St., Philadelphia, Pa.
Robbins Mfg. Co., John.—58 Kneeland St., Boston, Mass.
Smith Mfg. Co., The R. H.—Springfield, Mass.

STARTERS—AUTOMATIC

Auto-Demarreur Lemale.—31 quai de Suresnes, Suresnes, France.
Auto Improvement Co.—Factory, 316 Hudson St., Sales and Show Rooms, 2128 Broadway, New York City.
Beliet.—Chemin des Quatre-Maisons, Lyon-Monplaisir, France.
Cinogène.—36 rue des Grandes-Carrières, Paris, France.
Joly et Cie.—40 rue Pascal, Paris, France.
Milne Auto-Start Co.—919 W. Fort St., Detroit, Mich.
Renault Frères.—139 rue du Point-du-Jour, Billancourt, Seine, France.
Saurer, Adolph.—Arbon, Switzerland.
Société Anonyme des Automobiles et d'Electricité Mors.—48 rue du Theatre, Paris, France.
Société Anonyme le Centaure.—208 cours Gambetta, Lyons, France.
Torchon et Meunier.—7 rue des Acacias, Paris, France.

STEAM GAUGES, see GAUGES, AIR, STEAM, AND PRESSURE

STEEL.

American Iron & Steel Mfg. Co.—Lebanon, Pa.
American Steel Hoop Co.—Pittsburg, Pa.
Bethlehem Steel Co.—S. Bethlehem, Pa.
Boker & Co., Herman.—101 Duane St., New York City.
Braeburn Steel Co.—Braeburn, Pa.
Buffalo Steel Co.—Fillmore Ave., Tonawanda, N. Y.
Buffalo Steel & Shafting Co.—Foot Baize Ave., Buffalo, N. Y.
Cambria Steel Co.—440 Ellicott Sq., Buffalo, N. Y.
Carnegie Steel Co.—Pittsburg, Pa.
Carpenter Steel Co.—Reading, Pa.
Columbia Steel Co.—Elyria, O.
Crucible Steel Co. of America.—Empire Bldg., Pittsburg, Pa.
Elliott-Blair Steel Co.—Taylor and Mercer Sts., New Castle, Pa.

STEEL (Continued)

Finished Steel Co.—1623 Wilson Ave., Youngstown, O.
Illinois Steel Co.—203 Ellicott Sq., Buffalo, N. Y.
Jones & Laughlin Co.—Pittsburg, Pa.
Kellog, Geo. S.—Builders Exchange, Buffalo, N. Y.
Lackawanna Steel Co.—Hamburg Turnpike and Ridge Rd., Buffalo, N. Y.
Lukens Steel Co.—Coatesville, Pa.
Midgley Mfg. Co.—Columbus, O.
Midvale Steel Co.—Philadelphia, Pa.
Morris & Bailey Steel Co.—Ger. Nat'l Bank Bldg., Pittsburg, Pa.
Nash & Co., Geo.—224 Pearl St., New York City.
New York State Steel Co.—1000 White Bldg., Buffalo, N. Y.
Pardee Works, The C.—Perth Amboy, N. J.
Prosser and Sons, Thos.—15 Gold St., New York City.
Republic Iron & Steel Co.—Stock Exchange Bldg., Chicago, Ill.
Royal Metal Steel Co., Inc.—24 State St., New York City.
Standard Gauge Steel Co.—Beaver Falls, Pa.
Superior Steel Co.—Carnegie, Pa.
Uniform Steel Co.—Newark, N. J.
Union Drawn Steel Co.—Beaver Falls, Pa.
United States Steel Products Export Co.—203 Ellicott Sq., Buffalo, N. Y.
United States Indestructible Gasket Co.—16 S. William St., New York City.
Wickwire Steel Co.—Office 1027 White Bldg., Buffalo, N. Y.
Worcester Pressed Steel Co.—North and Barber Aves., Worcester, Mass.

STEEL, BAR, see IRON AND STEEL, BAR

STEEL—CHROME-NICKEL

Bethlehem Steel Co.—S. Bethlehem, Pa.
Carpenter Steel Co.—Reading, Pa.
Columbia Steel Co.—Elyria, O.
Gautier & Co., D. G.—20 Cliff St., New York City.
Johnson & Co., Isaac G.—Spuyten Duyvil, N. Y.
Midvale Steel Co.—Philadelphia, Pa.
New Process Steel Co., The.—Marshall, Mich.
Orford Copper Co.—43 Exchange St., Reading, Pa.
Parish Mfg. Co.—7th and Chestnut Sts., Reading, Pa.
Prosser and Sons, Thos.—15 Gold St., New York City.
Royal Metal Steel Co., Inc.—24 State St., New York City.

STEEL, SHEET, SEE IRON AND STEEL, SHEET

STEEL—VANADIUM

American Vanadium Co.—Frick Bldg., Pittsburg, Pa.
Willans & Robinson, Ltd.—Queen's Ferry, S. O., Flintshire, England. G. T. Ehrenzeller, the Pennsylvania Bldg., Philadelphia, Pa., U. S. Agent.

STEPS.

Hayes Mfg. Co.—360-370 Maybury Ave., Detroit, Mich.
Strieby & Foote Co.—301 Ogden St., Newark, N. J.
Western Automatic Machine Screw Co., The.—Elyria, O.

STRAINERS—GASOLENE

American Motor Parts Co.—21-25 Plymouth Court, Chicago, Ill.
Breeze Carbureter, Co. of New York.—101 W. 66th St., New York City.
Century Specialty Co.—401 Deschler Ave., Columbus, O.
Clark, E. P.—Arcade, Utica, N. Y.
Galvin Co., The J. F.—74-78 Fort St. E., Detroit, Mich.
Hatcher Auto Parts Co.—Cleveland, O.
Jones, Wm. S.—1303 Michigan Ave., Chicago, Ill.
Kaufmann, Chas.—45 S. Main St., Oshkosh, Wis.
Lunkenheimer Company, The.—Cincinnati, O.
Motor Car Specialty Co.—112 N. Broad St., Philadelphia, Pa.
Williams Valve Co., D. T.—904-910 Broadway, Cincinnati, O.
Wilson & Co., F. Cortez.—239-41 Lake St., Chicago, Ill.
Winkley Co., The.—226 Abbot St., Detroit, Mich.

STRAPS, TOP—LEATHER

Fine, Horace E.—19 E. State St., Trenton, N. J.
Wing & Co., Charles.—Amesbury, Mass.

SUPPLY DEALERS

A

Akron Automobile Garage.—Cor. Main and Cedar Sts., Akron, O.; garage, repairing (Franklin, Winton).
Albany Garage Co.—28 ... Albany, N. Y.; garage less, Thomas, Mvens-Duryea).
Albany Hardware State St., Albany, N.
Anderson Automobile place, Aurora, Ill.; g (Rambler, White).
Auburn Automobile Co.—burn, N. Y.; garage, repairs Pope-Hartford, Royal, Northern

SUPPLY DEALERS (Continued)

Auto Car Equipment Co., The.—77 Edward St., Buffalo, N. Y.; garage.
Autolight & Motor Supply Co., The.—506-508 N. Broad St., Philadelphia, Pa.
Automobile Gasoline Co.—422 S. Theresa Ave., St. Louis, Mo.
Automobile Station.—42-48 Pleasant St., Manchester, N. H.; garage, repairs.
Automobile Owners Supply Co.—1665 Broadway, New York City.
Automobile Specialty Co.—913 Orange St., Wilmington, Del.
Auto Supply Co., The.—1733-1737 Broadway, New York City.
Avondale Auto & Supply Co.—Reading Road and Windham Ave., Cincinnati, O.
Ayer Automobile Station.—E. Main St., Ayer, Mass.; garage, repairs.

B

Baldwin Motor Works.—Merrick Road, Freeport, L. I., N. Y.; garage.
Ballou, J. P.—175 Washington St., North Attleboro, Mass.; garage, repairing.
Batavia Machine Co., The.—24 Main St., Batavia, N. Y.; repairing.
Bath Automobile & Gas Engine Co.—Broad and Commercial Sts., Bath, Me.; garage, repairs (Winton, Franklin, Cadillac).
Bean, Sidney A.—1780-82 Broadway, New York City.
Beckley-Ralston Co., The.—80-82-84 Michigan Ave., Chicago, Ill.
Behen-Faught Motor Car Equipment Co.—3961 Olive St., St. Louis, Mo.
Bellinger's Garage.—10-12 Lander's St., N. Broadway, Newburgh, N. Y.; garage, repairs.
Bill, John T.—10th and Main Sts., Los Angeles, Cal. (Stoddard-Dayton).
Bindrim, Julius.—1057 Bedford Ave., Brooklyn, N. Y.
Blue Ribbon Garage.—291 Fairfield Ave., Bridgeport, Conn.; garage, repairs (Columbia, Winton, Cadillac, Franklin, Lozier).
Broadway Bicycle & Auto Supply Co.—60 Vesey St., New York City.
Brook Automobile Supply Co.—197 Fulton St., New York City.
Buffalo Carburetor Co.—889 Main St., Buffalo, N. Y.
Buffalo Motor Car Co.—437 Pearl St., Buffalo, N. Y. (Autocar, Hotchkiss, Cartecar).

C

Campbell Garage, The.—47 St. Louis St., Quebec, Canada; garage.
Capital Garage.—337 Water St., Augusta, Me.; garage, repairs.
Carlow Automobile Co.—51-59 Weir St., Taunton, Mass.; repairing, garage (Winton, Buick).

SUPPLY DEALERS (Continued)

Catlin, F. B.—Winsted, Conn. (Cadillac), 2nd hand cars.
Caulkins & Co., F. L.—405-415 Main St., Middletown, Conn.; garage, repairing (Cadillac, Knox, Winton, Pope-Hartford).
Centaur Motor Co.—53-61 Franklin St., Buffalo, N. Y.
Central Automobile Station Co.—55 West St., Pittsfield, Mass.; garage, repairing, (Pierce Arrow, Franklin, Pope-Hartford, Stevens-Duryea).
Central Garage.—Durfee St., opposite Armory, Fall River, Mass.; repairing, garage.
Chanslor & Lyon Motor Supply Co.—542-4-6 Golden Gate Ave., San Francisco, Cal.
Chateau des Beaux Arts.—Huntington, L. I., N. Y.; repairing; garage.
Chisholm-Philips Automobile Co.—1506-8 Euclid Ave., Cleveland, O.; garage, repairing (Stevens-Duryea).
Cincinnati Automobile Co.—215-17 E. 5th St., Cincinnati, O.
Close Bros.—405 Smith St., Schenectady, N. Y.; garage, repairs (Knox, Cadillac).
Collison's Garage.—Cor. Church and Maple Sts., Burlington, Vt.; garage, repairs.
Collister & Sayle.—224 Superior Ave., N. W., Cleveland, O.
Connell, W. J.—36 Columbus Ave., Boston, Mass.
Colonial Garage.—Narragansett Pier, R. I.; garage, repairs.
City Automobile Co.—Crawfordsville, Ind.; garage.

D

Danbury Howe Co.—249-51 Main St., Danbury, Conn. (Rambler).
Dann's Auto Station, J. T.—314 Main St., Danbury, Conn.; garage, repairs.
Darling, K. C.—1686 Broadway, New York City.
Davis Automobile Co., Inc.—7 Dorrance St., Providence, R. I.; garage, repairs (Winton, Peerless, Locomobile, Oldsmobile, Cadillac, Darracq).
Demster Machinery Co., W. R.—16 and Walnut Sts., Kansas City, Mo.; repairing, garage.
Denniston, E. E.—184 W. Mohawk St., Buffalo, N. Y.
Diamond Rubber Co. of N. Y.—715 Main St., Buffalo, N. Y.
Disbrow Bros.' Garage.—Hillside Ave. and Hoffman Bvd., Jamaica, L. I.; garage, repairs (Rainier, Ford, White, Stearns).
Dominion Motor Car Co., Ltd.—11 Beaver Hall Hill, Montreal, Canada; garage, repairing.

SUPPLY DEALERS (Continued)

- Dowling's Garage.**—26-30 Forest Ave., Portland, Me.; repairs, garage (Thomas Flyer, Royal).
Dunne, D. W.—143 Federal St., Boston, Mass.
Dyde & Richards Auto Supply Co.—1691 Broadway, New York City.

E

- Easland, John N.**—Main St., Nr. Berkshire Inn., Great Barrington, Mass.; garage, repairs.
Elite Mfg. Co.—Ashland, O.
Eureka Supply Co.—230 Broadway, Buffalo, N. Y.
Excelsior Carriage Co.—Main St., White River Junction, Vt.
Excelsior Steel Ball Co.—Military Rd., Buffalo, N. Y.

F

- Fawcett, C. E.**—119-121 3rd Ave., Cedar Rapids, Ia.; repairing, garage (National).
Ferre, E. E.—379 Washington St., Buffalo, N. Y.
Ferres, John G.—118 W. Main St., Johnstown, N. Y. (Reo).
Fire-Proof Garage.—1061-2 Main St., North Adams, Mass.; garage, repairs.
Frasse & Co., Peter A.—92-4 Fulton St., New York City.

G

- Gate's Garage.**—Bellows Falls, Vt.; repairs.
General Automobile Supply Co.—1671 Broadway, New York City.
Geneva Automobile Co.—145 Castle St., Geneva, N. Y.
Gibbney & Bros., Jas. L.—211-213 N. Broad St., Philadelphia, Pa.
Gorman Supply Co., The.—134 E. 25th St., rooms 29 and 30, New York City.
Gourley, R. J.—Springfield, Ill. (Monarch).
Green & Warnick.—Stewart St., Amsterdam, N. Y.; garage, repairs (Pope-Toledo, Stevens-Duryea).
Greenfield Automobile Co.—21 Federal St., Greenfield, Mass.; garage, repairs (Rambler, Ford).
Gross Terrace Garage.—Rear 1396 Madison St., Chicago, Ill.; garage, repairing.

H

- Hadlock, W. Y.**—15 N. Main St., Manchester, N. H.; garage, repairs (Rambler, Queen).
Harrington Garage.—Worcester, Mass.
Hayes, Walter.—1116 Main St., Buffalo, N. Y. (Jewel, White).
Heineman-Pearson.—1018 S. Main St., Los Angeles, Cal.

SUPPLY DEALERS (Continued)

- Hercules Auto Specialty Mfg. Co.**—115 Dearborn St., Chicago, Ill.
Herkimer Motor Car Co.—124-26 Albany St., Herkimer, N. Y.
Hessel's Garage, E. S.—15 Brookfield St., White Plains, N. Y.; garage.
Hughson & Merton.—426 Golden Gate Ave., San Francisco, Cal.; 1040 Main St., Los Angeles, Cal.

I

- Indiana Electric Co.**—724 Philadelphia St., Indiana, Pa.
Ingalls Garage Co.—State St., Newburyport, Mass.; repairing, garage.

J

- Jaynes Auto Supply Co.**—806 Main St., Buffalo, N. Y.
Jewett's Garage.—58 Pleasant St., Claremont, N. H.; repairing, garage (Rambler, Maxwell).
Johnson Carriage Co.—Forest St. and East Ave., New Canaan, Conn.; garage, repairing.

K

- Kasner, A. H.**—152 Church St., New York City.
Keating Garage Co.—145 W. 2nd St., Oswego, N. Y.; repairing, garage.
Keiser-Vanleir Co.—505-7 East St., Bloomington, Ill.; repairing (Rambler).
Kensington Garage.—712-714 Coney Island Ave., Nr. Ave. D, Brooklyn, N. Y.; garage, repairing, renting.
Koenig Bros.—Broadway bet. Central Ave. and Main St., Tarrytown, N. Y.; garage, repairs (Premier, Reo).

L

- Lawson's Garage.**—810-12-14-16 South St., Peekskill, N. Y.; repairs, garage.
Leonard, H. M.—625 W. Broad St., Elyria, O.; garage, repairs (Jackson).
Lisk & Petry.—405-407 Diamond St., Hudson, N. Y.; garage, repairs (Stevens-Duryea, Cadillac, Thomas).
Lockwood & Co., F. E.—39 Wall St., Norwalk, Conn.; garage, repairing (Locomobile, Waltham, Autocar, Elmore, White).
Lockwood Bros.—103-109 W. Pearl St., Jackson, Mich.; garage (Pope Toledo, Jackson).
Lowell Automobile Co.—Asketon St. and Post Office Ave., Lowell, Mass.; garage, repairing (Stevens-Duryea, Cadillac, Pope-Toledo).

Magoon Motor C

- St., S. E., Cleveland, O.; repairs (Pope Toledo).
Maine Motor Carriage Co.—Main and South Sts., Portland, Me.; repairs (Haynes, Pope-Hartford, Stevens-Duryea).

SUPPLY DEALERS (Continued)

- Manhattan Storage Co.**—1611 Broadway, New York City.
Manzel Bros.—317 Babcock St., Buffalo, N. Y.
Mayer Carburetor Co.—2673 Main St., Buffalo, N. Y.
Marble Auto Garage, W. H.—69 Main St., Brockton, Mass.; garage, repairing (Columbia, Locomobile, Cadillac, Knox, Winton).
Mechaley Auto Co.—30-40 Summer St., Stamford, Conn.; garage, repairing (Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, Cadillac, White).
Michelin Tire Agency.—230 Broadway, Buffalo, N. Y.
Miller Bros.—Office, 7 Bay St.; garage, 12 Maple St., Glens Falls, N. Y.; garage, repairs (Buick).
Miller, Chas. E.—Mfr., jobber, exporter and importer of automobile supplies, 97-101 Reade St., 924 8th Ave., New York City; 406 Erie St., Cleveland, O.; 318-230 N. Broad St., Philadelphia, Pa.; 227½-229 Jefferson Ave., Detroit, Mich.; 202-204 Columbus Ave., Boston, Mass.; 824 Main St., Buffalo, N. Y.
Miller's Garage Co.—554-6-8 Fairfield Ave., Bridgeport, Conn.; repairing (Rapid, Glide, Maxwell).
Moore Co., Inc., Geo. P.—721 Golden Gate Ave., San Francisco; 1005 S. Main St., Los Angeles; 231 Twelfth St., Oakland, Cal.; 332 Broadway, New York City.
Morris' Auto Garage.—Fulton St., Cor. Merrick Road, Jamaica, N. Y.; garage, repairs.
Morse, T. S.—Lenox, Mass.; garage, repairs.
Motor Car Co. of N. J.—289-93 Halsey St., Newark, N. J.; elec. charging, repairing and garage (Autocar, Cadillac, Packard).
Motor Equipment Co.—901 Pike St., Seattle, Wash.
Motor Parts Co.—25 W. 42nd St., New York City.

N

- National Gasket Co.**—48 Great Jones St., New York City.
National Sales Corporation.—296 Broadway, New York City (importer and ributor).
Nad Auto & Supply Co.—3948 Olive St., Mo.
ngineering Works.—359-65 Newport, R. I.; repairing.
k and Brooklyn Auto Supply
 13 Broadway, New York City.
'alls Automobile Transit Co.—
 in St., Niagara Falls, N. Y.;
 repairing (Cadillac, Winton).

SUPPLY DEALERS (Continued)

- Niagara Tachometer & Instrument Co.**—26th and Adams St., Niagara Falls, N. Y.
New York Sporting Goods Co.—17 Warren St., New York City.
Nock Co., Inc., Geo. W.—126 N. 4th St., Philadelphia, Pa.
Norcross-Cameron Co.—57-61 Bridge St., Springfield, Mass.; garage (Rambler, Corbin, Ford).

O

- Official A. A. A. Blue Book Station.**—Concord, N. H.; garage, repairing.
O'Kane Co., J.—528 Golden Gate Ave., San Francisco, Cal.
O. K. Machine Wks.—887 Main St., Buffalo, N. Y.; garage, repairing.
Olmsted & Son, H. R.—413 S. Clinton St., Syracuse, N. Y.

P

- Palmer, Frank.**—40-50 Jefferson Ave., N., Battle Creek, Mich.; garage, repairing (Reo).
Patterson, Gottfried & Hunter, Ltd.—146-150 Centre St., New York City.
Pennsylvania Rubber Co.—717 Main St., Buffalo, N. Y.
Perkins & Corliss.—65 Middle St., Gloucester, Mass.; repairs (Maxwell, Rambler).
Philadelphia Auto Exchange.—832 Arch St., Philadelphia, Pa.
Pittsfield Auto Garage Co.—328 North St., Pittsfield, Mass.; garage, repairing (Rapid, Maxwell, Berkshire).
Parker & Co. Auto Station, D. L.—18 Market St., New Bedford, Mass.; garage, repairs (Pope-Toledo, Pope-Hartford).
Pope Mfg. Co.—Hartford, Conn.
Pope Motor Car Co.—Casino Terrace, Newport, R. I.; garage, repairs.
Post & Lester Co.—Sargeant St., Hartford, Conn.
Purington, A. B.—126 Exchange St., Bangor, Me.; garage, repairs (Columbia).

Q

- Quoque Automobile & Bicycle Co.**—Jesop Ave., Quoque, N. Y.; repairs, garage.

R

- Reichert Automobile Co.**—34-44 Temple St., New Haven, Conn.; repairing, garage (Haynes, Waltham).
Reliance Automobile Co.—547-557 Fulton St., San Francisco, Cal.; garage, repairing.
Rhodes, H. C.—E. Main St., Bay Shore, N. Y.
Roby Co., Sidney B.—208 South Ave., Rochester, N. Y.

SUPPLY DEALERS (Continued)

- Roos Bros.**—Van Ness at Bush St., San Francisco, Cal.
Ross Motor Car Co., C. A.—40 W. Main St., Little Falls, N. Y.; garage, repairs.
Rubay, Leon.—1697 Broadway, New York City.
Russell & Hoague.—425 E. Main St., Kalamazoo, Mich.

S

- Sague & Son, Horace.**—184-192 Church St., Poughkeepsie, N. Y.; garage, repairs (Cadillac).
Seagate Automobile Equipment Co.—1218 Bedford Ave., Brooklyn, N. Y.
Seaman's Auto Water Heaters.—448 Niagara St., Buffalo, N. Y.
Seneca Auto Supply Co.—13 Plymouth St., Chicago, Ill.
Shain, Chas. D.—70 Murray St., New York City.
Sid Black Automobile Co.—630 Walnut St., Cincinnati, O.; renting, garage, repairs (Lozier, Franklin, Babcock, Thomas, Buick).
Siegel Cooper Co.—Sixth Ave., 18th to 19th Sts., New York City.
Smith Garage & Repair Co., Geo.—257 N. Union St., Olean, N. Y.; garage, repairs.
Smith-Haines.—1673 Broadway, New York City.
South Broad Automobile Co.—729 South Broad St., Philadelphia, Pa.; garage, repairs, renting, elec. charging (Dorris, Stevens-Duryea).
Spencer Regulator Co.—5-7 Front St., Salem, Mass.
Sports Ltd.—2049 Broadway, New York City.
Standard Auto Co.—Woodward Ave., cor. Alexandrine, Detroit, Mich.; repairing (Packard, Oldsmobile).
Star Electrical & Garage Co.—609-13 French St., Erie, Pa.; garage, repairing.
Stevens & Co.—99 Chambers St., New York City.
Stoltz, C. C.—126-8 N. Prospect St., Marion, O.; garage, repairs (Buick, Autocar).
Strauss, J. & Son.—197 E. Genesee St., Buffalo, N. Y.
Strauss, Mathew.—707 Main St., Buffalo, N. Y.
Sutton, John W.—Garages, 342-4 Flatbush Ave., 10-12 Clinton St., Electric Battery Station, 811-13 Union St., Brooklyn, N. Y.

T

- Thirty-five Per Cent. Auto Supply Co.**—83 Chambers St., New York City.
Topeka Automobile & Cycle Co.—7th and Quincy Sts., Topeka, Kas.

SUPPLY DEALERS (Continued)

- Towle Co., E. H.**—25 W. Main St., Waterbury, Conn.; garage, repairing (Locomobile, Franklin, Cadillac).

U

- United States Automobile Co.**—21-29 Plymouth Ave., Nr. Main St., W. Rochester, N. Y.; garage, repairing (Locomobile, Autocar, Stevens-Duryea, Pierce-Arrow, Stearns).
University Garage Co.—St. John and Olive Sts., New Haven, Conn.; garage (Wayne).
Updike, C. Ora.—145 E. Main St., Lexington, Ky.
Utica Automobile Station.—22-24 W. Utica St., Buffalo, N. Y.; garage, repairs.
Utica Motor Car Co., The.—333-5-7 Bleecker St., Utica, N. Y.; garage, repairs (Buick, Peerless, Pierce-Arrow, Thomas Flyer, Baker, Cadillac, Darracq).

V

- Van Benschoten, John.**—14-20 Catherine St., Poughkeepsie, N. Y.; garage, repairs (Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Lozier).

W

- Walker Co., E. C.**—1913-23 Logan St., Louisville, Ky.
Wallace Bros. Co.—46-48 Main St., New Rochelle, N. Y.; garage, repairs (Maxwell).
Warner Inst. Co.—722 Main St., Buffalo, N. Y.
Welch Bros. Motor Car Co.—Grand Ave., cor. 7th St., Milwaukee, Wis.; repairs, garage (Locomobile, Packard, Pope-Hartford, Woods).
Westerly Garage, The.—88 Main St., Westerly, R. I.; garage, repairing.
Westchester Motor Car Co.—124-6 Main St., Nr. Franklin Ave., New Rochelle, N. Y.; garage, repairs.
White Automobile Agency.—1116 Main St., Buffalo, N. Y.; garage (White).
White Plains Garage.—2-4 Mamaroneck Ave., White Plains, N. Y.; garage.
Widmayer, F. B.—2312 Broadway, Nr. 84th St., New York City.
Willis Co.—8 Park Place, New York City.
Willys-Crew Motor Car Co.—117-119 Main St., Elmira, N. Y.; garage, repairs (Rambler, White, Premier, Pope-Waverley, Ford, American).
Winn, Wm. R.—143 Maiden Lane, New York City.

SUPPLY DEALERS (Continued)

Woodwell Co., Jos.—201 Wood St., Pittsburgh, Pa.
Wooster Automobile Co.—88 Chambers St., New York City.
Wyckoff, Church & Partridge.—Broadway at 56th St., New York City; repairing, garage (C. G. V., Stearns).

Y

Yates, Russel P.—887 Main St., Buffalo, N. Y.

SWITCHES—ELECTRIC

American Coil Co., Inc.—Cor. Wall and Cocasset Sts., Foxboro, Mass.
Atwater Kent Mfg. Works.—50 N. Sixth St., Philadelphia, Pa.
Auto Appliance Co.—24 Mechanic St., Newark, N. J.
Auto Lock Co.—6546 Minerva Ave., Chicago, Ill.
Auto Lock Plug Co., Inc.—31 Nassau St., New York City.
B. & J. Mfg. Co.—3985 Cottage Grove Ave., Chicago, Ill.
Brandow Combination Lock Switch Co.—86 North St., Pittsfield, Mass.
Connecticut Telephone & Electric Co., Inc.—70 Britannia St., Meriden, Conn.
Dayton Electrical Mfg. Co.—87 St. Clair St., Dayton, O.
Eldredge Electrical Mfg. Co.—7 Post Office Square, Springfield, Mass.
Goebel, F. A.—Marietta, O.
Hart & Hegeman Mfg. Co.—Hartford, Conn.
Helios Mfg. Co.—Bridesburg, Philadelphia, Pa.
Herz & Co.—203-205 Lafayette St., New York City.
Knoblock-Heideman Mfg. Co.—South Bend, Ind.
Kokomo Electric Co.—339 Smith St., Kokomo, Ind.
M'Kibbon Mfg. Co.—South Norwalk, Conn.
Motor Specialty Mfg. Co.—105 Washington St., Chicago, Ill.
National Coil Co.—Lansing, Mich.
Pass & Seymour, Inc.—52 Boyd Ave., Solvay, N. Y.
Pittsfield Spark Coil Co.—Dalton, Mass.
Robert Instrument Co., The.—56 Shelby St., Detroit, Mich.
Electric Co., The.—326 Jefferson St., Detroit, Mich.
Electric Co.—207 Jefferson St., Detroit, Mich.
Electric Co.—South Norwalk, Conn.

Electric Co.—261-5 Walton Ave., New York City.
Auto Supply & Mfg. Co.—20 St., New York City.
Electric Co.—301 Division St., New York City, Ind.

SWITCHES—ELECTRIC (Continued)

Williams, E. Q.—533 S. Clinton St., Syracuse, N. Y.
Willis Co., E. J.—8 Park Place, New York City.
Witherbee Igniter Co.—541 W. 43rd St., New York City.

TACHOMETERS

Schaefer & Budenberg Mfg. Co.—Foxboro, Mass.
Veeder Mfg. Co.—Cor. Garden and Sargeant Sts., Hartford, Conn.

TACHODOMETERS

Veeder Mfg. Co.—Cor. Garden and Sargeant Sts., Hartford, Conn.

TALC—TIRE

American Lava Co.—27-33 William St., Chattanooga, Tenn.

TANKS

A. Z. Co., The.—527 W. 56th St., New York City.
Acetylene Gas Illuminating Co.—105 Walker St., New York City.
Avery Stamping Co.—5207 Lakeside Ave. N. E., Cleveland, O.
Badger & Sons Co., E. B.—63-69 Pitts St., Boston, Mass.
Bowser & Co., S. F.—Fort Wayne, Ind.
Boyd, James.—73 39th St., Brooklyn, N. Y.
Boyer, Radford & Gordon Tank & Pump Co.—Dayton, O.
Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Christian Off & Co.—Indianapolis, Ind.
Fedders Mfg. Co.—57-59 Tonawanda Ave., Buffalo, N. Y.
Folsom Mfg. Co., C. G.—South Bend, Ind.
Freeland Sons Co., B. F.—Sturgis, Mich.
Getchell & Sons, S. S.—Woonsocket, R. I.
Gleason Peters Air Pump Co.—Mercer and Houston Sts., New York City.
Gray & Sons, Peter.—90 Union St., Boston, Mass.
Hayes Mfg. Co.—360-370 Maybury Ave., Detroit, Mich.
Imperial Brass Mfg. Co.—245-247 Jefferson St., Chicago, Ill.
Ironclad Mfg. Co.—204 Varet St., Brooklyn, N. Y.
Janney, Steinmetz & Co.—Fourth and Market Sts., Philadelphia, Pa.
Kinsey Mfg. Co.—Dayton, O.
Koven & Bros., L. O.—50 Cliff St., New York City.
Manufacturers Can Co.—132-36 Mulberry St., Newark, N. J.
Mullins Co., W. H.—Salem, O.
Murrey & Murrey.—113 Allegan St., E. Lansing, Mich.
National Oil Pump & Tank Co.—Dayton, Ohio.

TANKS (Continued)

Non-Explosive Safety Naptha Container Co.—1133 Broadway, New York City.
Northmann-Duffke Foundry Co.—26th St. and Layton Ave., Milwaukee, Wis.
Ohio Blower Co., The.—330 Prospect Ave., N. W., Cleveland, O.
Pressed Steel Tank Co.—Milwaukee, Wis.
Tokheim Mfg. Co.—815 N. First St., Cedar Rapids, Ia.
Trageser Steam Copper Works, John.—447-457 W. 26th St., New York City.
Turner Brass Works, The.—72 Michigan St., Chicago, Ill.
Western Drop Forge Co.—Marion, Ind.
Western Oil Pump Co.—2447 Kosciusko St., St. Louis, Mo.
Wilson & Co., F. Cortez.—239-241 Lake St., Chicago, Ill.
Wright, Cooler & Hood Mfg. Co.—1545 Michigan Ave., Chicago, Ill.

TANKS—ACETYLENE

Avery Portable Lighting Co.—18-22 Martin St., Milwaukee, Wis.
Commercial Acetylene Co.—80 Broadway, New York City.
Old Colony Light Co.—Motor Mart, Boston, Mass.
Prest-O-Lite Co.—20 S. East St., Indianapolis, Ind.

TANKS—STORAGE

American Steel Barrel Co.—204-6 Varet St., Brooklyn, N. Y.
Bowser & Co., S. F.—Ft. Wayne, Ind.
Boyer, Radford & Gordon Tank & Pump Co.—Dayton, O.
Brown Oil Can Co.—Dawson St., Toledo, Ohio.
Eastern Oil Tank Co.—136 Fletcher St., Lowell, Mass.
Freeland Sons Co., B. F.—Sturgis, Mich.
Getchell & Sons, S. S.—Woonsocket, R. I.
Gilbert & Barker Mfg. Co.—80-82 Fourth Ave., New York City.
Hydraulic Oil Storage Co.—820 Penobscot Bldg., Detroit, Mich.
Ironclad Mfg. Co.—204 Varet St., Brooklyn, N. Y.
Kaltenbach, Fred.—12 N. Jefferson St., Chicago, Ill.
National Oil Pump & Tank Co.—Dayton, O.
Safety Tank Co.—25 W. 42nd St., New York City.
Stoutenborough, X.—277 Pearl St., New York City.
Tirrill Gas Machine Lighting Co.—75 Fulton St., New York City.
Western Drop Forge Co.—Marion, Ind.
Western Oil Pump Co.—2447 Kosciusko St., St. Louis, Mo.
Wilson & Co., F. Cortez.—239-41 Lake St., Chicago, Ill.

TANKS—TIRE INFLATING

Avery Portable Lighting Co.—18-22 Martin St., Milwaukee, Wis.
Lennox Chemical Co.—Cleveland, O.
Presto-O-Lite Co.—20 S. East St., Indianapolis, Ind.
Standard Carbonic Co.—Cincinnati, O.

TAPE—TIRE

Boston Woven Hose & Rubber Co.—29 Hampshire St., Cambridge, Mass.
Dunton & Co.—65 Atlantic Ave., Providence, R. I.
Goodyear Tire & Rubber Co.—Akron, O.
Massachusetts Chemical Co.—Walpole, Mass.
National Cement & Rubber Mfg. Co.—3053-59 Monroe St., Toledo, O.
National India Rubber Co.—Bristol, R. I.

TERMINALS

B. & B. Co.—97 Rockview Ave., Plainfield, N. J.
Bliss Chester Co.—31 Mathewson St., Providence, R. I.
Bosch, Robert.—160 W. 56th St., New York City.
Briggs, W. H.—424 Bedford Ave., Brooklyn, N. Y.
Easton Carbon Works.—W. Bergen St., Jersey City, N. J.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
Herz & Co.—203-205 Lafayette St., New York City.
Igniter Appliance Co.—723 Central Ave., Cleveland, O.
Knoblock-Heideman Mfg. Co.—South Bend, Ind.
Mohawk Electric Co.—1554 Union St., Schenectady, N. Y.
Never-Miss Spark Plug Co.—321-23 Michigan Ave., E., Lansing, Mich.
Noonan Tool & Machine Works.—Rome, N. Y.
O. K. Connector Co.—51 Waldo St., Worcester, Mass.
Pittsfield Spark Coil Co.—Dalton, Mass.
Rajah Auto Supply Co.—147 Washington St., New York City.
Shain, Chas. D.—70 Murray St., New York City.
Stackpole Battery Co.—St. Marys, Pa.
Standard Battery Connector Co.—27 Copeland St., Roxbury, Mass.
Standard Co.—Torrington, Conn.
Terminal Holder Specialty Co.—1251 Michigan Ave., Chicago.
Tregoning Electric Mfg. Co., I—High Ave., S. E., Cleveland.

THERMOSTA

Walker & Co., E. C.—191 Louisville, Ky.

THREAD—TOP & UPHOLSTERING

American Thread Co.—Boston, Mass.
Cranaka Thread Co., The.—Worcester, Mass.

TIMERS—SPARK

Acorn Brass Mfg. Co.—51 N. Peoria St., Chicago, Ill.
Altemus & Co., C. L.—Fourth and Locust Sts., Philadelphia, Pa.
American Coil Co., Inc.—Cor. Wall and Cocasset Sts., Foxboro, Mass.
Atwater Kent Mfg. Works.—50 N. 6th St., Philadelphia, Pa.
Auto & Power Appliance Co.—The Arcade, Cleveland, O.
Auto Appliance Co.—24 Mechanic St., Newark, N. J.
Auto Instrument Co.—228 N. 4th St., Philadelphia, Pa.
Auto Specialty Co.—6 E. Madison St., Chicago, Ill.
Beckley-Ralston Co.—80-84 Michigan Ave., Chicago, Ill.
Bemus Co., Inc., T. Alton.—358 Atlantic Ave., Boston, Mass.
Black, A. B.—21 S. Market St., Boston, Mass.
Burt Mfg. Co.—128 N. Edward St., Kalamazoo, Mich.
Connecticut Telephone & Electric Co., Inc.—70 Britannia St., Meriden, Conn.
Crouse-Hinds Co.—Jefferson St., Syracuse, N. Y.
Dayton Electrical Mfg. Co.—87 St. Clair St., Dayton, O.
Dodge Lubricator Co.—8 Waltham St., Boston, Mass.
Fulmer, C. F.—Plainfield, N. J.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
Hardy Co., R. E.—86 Watts St., New York City.
Herbert, W. H.—3312 Wabash Ave., Chicago, Ill.
Herz & Co.—203-205 Lafayette St., New York City.
Illinois Auto & Parts Co.—Globe and Main Sts., Peoria, Ill.
Kokomo Electric Co.—339 Smith St., Kokomo, Ind.
Lindsay, Jr., A. M.—523 Granite Bldg., Rochester, N. Y.
Milwaukee Auto Engine Supply Co.—706-708 Winnebago St., Milwaukee, Wis.
or Speed Recorder Co.—274 Pearl Cambridge, Mass.
omb, A. H.—815 W. 21st St., Chicago, Ill.
less Equipment Co.—170 S. Clinton, Chicago, Ill.
eer Brass Works.—418-424 S. Penna., Indianapolis, Ind.
field Spark Coil Co.—Dalton, Mass.
ell Muffler & Timer Co.—44 Lafayette St., Utica, N. Y.

TIMERS—SPARK (Continued)

Precision Appliance Co.—832 Austin Ave., Chicago, Ill.
Quad Mfg. Co., The.—35-37 S. Scioto St., Columbus, O.
Robert Instrument Co., The.—56 Shelby St., Detroit, Mich.
Schaal, W. R.—27 N. Jefferson St., Chicago, Ill.
Sintz, Guy L.—Fulton and Front Sts., Grand Rapids, Mich.
Splitdorf, Chas. F.—261-5 Walton Ave., New York City.
Sterling Alternating Ignition Co.—184 Water St., Binghamton, N. Y.
Waukesha Motor Co.—110 North St., Waukesha, Wis.
Witherbee Igniter Co.—541 W. 43rd St., New York City.
Witherbee Manufacturing Co., Inc.—433 W. 42nd St., New York City.
Youse, E. S.—46 N. 5th St., Reading, Pa.

TIN—SHEET AND PIG

Columbia Smelting & Refining Co.—365 -67 West St., New York City.
Taylor Co., N. & G.—308 Chestnut St., Philadelphia, Pa.

TIRE FILLING COMPOUNDS, see FLUID, TIRE FILLING

TIRE PROTECTORS AND TIRE SLEEVES, see SHOES, TIRE

TIRES—CELLULAR

Brooke Patent Airless Tire Co.—1422 Grant Ave., Denver, Col.
Rubber Tire Co., The.—1215 Arch St., Philadelphia, Pa.
Vorhees Rubber Mfg. Co.—Bostwick Ave., Jersey City, N. J.

TIRES—CUSHION

Archer Auto Tire Co.—548 W. Center St., Marion, O.
Hartford Rubber Works Co.—691 Park St., Hartford Conn.
Motz Clincher Tire & Rubber Co.—Akron, O.
Puncture Proof Tire Co.—Guardian Bldg., 322 Euclid Ave., Cleveland, O.
St. John Rubber Tire Co.—116 Broad St., New York City.

TIRES—LEATHER

American Tire Co.—Owosso, Mich.
Babert et Cie, Louis—12 rue des Jacobins, Fontenay-le-Comte, Vendée, France.
Barthelat, P.—6 rue de Cormeille, Levallois, Seine, France.
Beau et Cie, C.—171 rue Lafayette, Lyons, France.
Bénard, E.—25 rue Louis-Dory, Pré-St-Gervais, Paris, France.

TIRES—LEATHER (Continued)

- Central Leather and Rubber Tire Works**—238-40 W. 50th St., New York City.
Desclée et Cie, G.—171 Ave. de la Reine, Brussels, Belgium.
Desjardin.—10 rue St-Pierre, Versailles, France.
Fougerat, J. S.—Neuvy-sur-Loire, Nièvre, France.
Healy Leather Tire Co.—90 Gold St., New York City.
Houben, Théodore.—Verviers, France.
Jacob, F.—89 rue Arago, Puteaux, France.
Muffat, Albert.—35 ru du Stand, Geneva, Switzerland.
Pacaud et G. Hamon.—66 rue du Bois, Levallois, Seine, France.
Pneumatic-cuir Samson.—10 rue François-Premier, Paris, France.
Pullman, Ltd., R. & J.—Westbrook Mills, Godalming, Surrey, England.
Roberts Non-Skid Motor Tyre Co.—Gripwell Works, St. Mary's Row, Birmingham, England.
Samson Leather Tire Co.—1634-42 Broadway, New York City.
Serize, et Cie., E.—6 rue Abel, Paris, France.
Société Anonyme "le Centaure."—208 cours, Gambetta, Lyons, France.

TIRES—PNEUMATIC.

- Ajax-Grieb Rubber Co.**—Trenton, N. J.
Automatic Ducasble.—5 rue du Roule, Neuilly, Seine, France.
Automobilia, Ltd.—532 Oxford St., London W., England.
Avon India Rubber Co., Ltd.—Melksham, Wiltshire, England.
Bakker unt Zoon.—Ridderkerk, Holland.
Bauer, A.—14 rue de Hollande, Geneva, Switzerland.
Belfroy, Simon et Cie.—68 rue de Villiers, Levallois, Seine, France.
Bergougnan, Société Générale des Etablissements.—Clermont - Ferrand, France.
Bezault, R.—16 bvd. de Villiers, Levallois, Seine, France.
Braunschweiger Gummi-Export.—Braunschweig, Germany.
Buchillet, P.—47 rue St. Ferdinand, Paris, France.
Casasco, Alessandro.—19 via San Secondo, Turin, Italy.
Clipper Pneumatic Tyre Co., Ltd.—Alma St., Coventry, England.
Collier Tyres.—127 Long Acre, London W. C., England.
Colonial Rubber, Société Anonyme.—Gand, Nord, France.
Continental Caoutchouc Co.—43 Warren St., and 2100 Broadway, New York City.
Continental Caoutchouc und Guttapercha Co.—Hanover, Germany.

TIRES—PNEUMATIC (Continued)

- Continental Rubber Works.**—19th and Liberty Sts., Erie, Pa.
Continental, Société Anonyme.—55 bvd. de la Mission-Marchand, Courbe-voie, France.
Commonwealth Rubber Co.—Reading, Mass., and 1001 Flatiron Bldg., New York City.
Diamond Rubber Co.—Akron, O.
Dunlop Pneumatic Tyre Co.—Hanau, Germany.
Dunlop, Société Française des Pneumatiques.—Argenteuil, Seine-et-Oise, France.
Dunlop Tyre Co., Ltd.—Aston, Birmingham, England.
East London Rubber Co., Ltd.—57 Arundel St., Sheffield, England.
Empire Automobile Tire Co.—Trenton, N. J.
Empire State Tire Co.—Buffalo, N. Y.
Engelbert, O. fils et Cie.—29 rue des Vennes, Liege, Belgium.
Erste Amsterdamsche Bandenfabriek, W. de Koff.—3 Helmerstraat 25, Amsterdam, Holland.
Eymard et Cie.—19 rue Copernic, Paris, France.
Falconnet - Perodeaud.—Choisy-le-Roi, Seine, France.
Fanning Tire Co.—1470 Michigan Ave., Chicago, Ill.
Firestone Tire & Rubber Co.—Miller St. and Sweitzer Ave., Akron, O.
Fisk Rubber Co., The.—Oak St., Chicopee Falls, Mass.
Fougerat, J. S.—Neuvy-sur-Loire, Nièvre, France.
Frankfurter Gummiwarenfabrik, Carl Stoeckich.—Frankfort-Niederror, Germany.
G. & J. Tire Co.—549 E. Georgia St., Indianapolis, Ind.
Garcia Gomez.—22 Uyvalencia, Barcelona, Spain.
Gare Patent Tyre & Wheel Co., Ltd.—15 St. Vincent St., Liverpool, England.
Gaulois Tire Co.—1739 Broadway, New York City.
Gesellschaft der Russisch-Französischen Gummi, Guttapercha-und Telegraphenwerke.—Riga, Russia.
Goodrich Co., B. F.—Akron, O.
Goodyear Tire & Rubber Co.—Akron, O.
Gorton Rubber Co., Ltd.—Corn Openshaw, Manchester, Engla
Goshen Rubber Works.—Goshen.
Grose, Ltd.—Northampton, Eng
Gummiwerke Fulda.—Fulda, G
Gummiwerke Oberspree.—(weide, Berlin, Germany.
Hanoversche Actiengummiwz...—Linden, Hanover, Germany.
Hanoversche Gummikamm Co.—ver, Germany.

TIRES—PNEUMATIC (Continued)

Harburg Tire Co.—234 W. 58th St., New York City.

Hartford Rubber Works Co.—691 Park St., Hartford, Conn.

Imperial Tyre & Rubber Co., Ltd.—Eagle Wharf Road, London N., England.

Independent Tire & Rubber Co.—Akron, Ohio.

India Rubber, Gutta-Percha & Telegraph Works Co., Ltd.—Persan-Beaumont, Seine-et-Oise, France.

Jenatzy-Leleux, C.—10 rue Stephenson, Brussels, Belgium.

Kley, Edouard.—18 rue Defacqz, Brussels, Belgium.

Kokomo Rubber Co.—Kokomo, Ind.

Le Caoutchouc, Société Anonyme.—39 ave. Marceau, Courbevoie, France.

Le Phénix, Pneumatiques.—107 rue de Paris, Petit-Ivry, Seine, France.

Lins Pneumatik Company.—Krausenstrasse 36, Berlin, Germany.

Liverpool Rubber Co., Ltd.—292 Vauxhall Road, Liverpool, England.

Mahoning Rubber Co.—Youngstown, O.

Manchester Tyre Co.—Oxford Road, Manchester, England.

Manifatture Martiny.—90 Corso Umberto Primiero, Rome, Italy.

Ménégaud-Basset, G.—35 ave. Laplace, Arcueil, Seine, France.

Mesinger H. & F. Mfg. Co.—1801-1807 First Ave., New York City.

Metzeler et Cie.—1 rue Villaret-de-Joyeuse, Paris, France.

Michelin et Cie.—105 Blvd. Peréire, Paris, France.

Michelin Tire Co.—Milltown, N. J.

Midland Rubber Co., Ltd.—Ryland St., Birmingham, England.

Mitteldeutsche Gummiwarenfabrik, Louis Peter.—Frankfort-am-Main, Germany.

Morgan & Wright.—Detroit, Mich.

Moseley & Sons, Ltd., David.—Ardwick, Manchester, England.

Muffat, Albert.—35 rue du Stand, Geneva, Switzerland.

North British Rubber Co., Ltd.—Castle Mills, Edinburgh, Scotland.

Oesterreichisch-Amerikanische Gummi-fabrik.—Breitensee, Hütteldorferstrasse 74, Vienna, Austria.

Olmsted & Son, H. R.—413 S. Clinton Syracuse, N. Y.

or Tyre Co., Ltd.—119 Shaftesbury, London W. C., England.

ia Rubber Co.—Jeannette, Pa.

—21 Ponte Seveso, Milan,

venice.—18 rue Traversière, France.

natic L'Electric Co.—1591 Broadway, New York City.

natiques Hutchison.—1 place, Brussels, Belgium.

TIRES—PNEUMATIC (Continued)

Polack, B.—Waltershausen-im-Thüringen, Germany.

Radax Pneumatic Tyre Co., Ltd.—51 Fountain St., Manchester, England.

Republic Rubber Co., The.—Youngstown, O.

Samson Leather Tire Co.—1634-42 Broadway, New York City.

Shawmut Tire Co.—97 Bedford St., Bedford, Mass.

Sirdar Rubber Co., Ltd.—Shirland Road, Paddington, London W., England.

Société Anonyme "le Centaure."—208 cours Gambetta, Lyons, France.

Société Industrielle des Téléphones.—25 rue du Quatre-Septembre, Paris, France.

Swinehart Clincher Tire & Rubber Co.—Akron, O.

Torrilhon, Société Anonyme des Anciens Établissements, J. B.—10 faubourg Poissonnière, Paris, France.

Trident Tire Co.—1593 Broadway, New York City.

Traction Tread Tire & Tube Co.—1695 Broadway, New York City.

Usines Jackson.—Halluin, Nord, France.

Van Bilderbeck, H. W.—Jacob van Campenstraat 54, Amsterdam, Holland.

Vereingte Gummiwarenfabriken Harburg-Wien.—Vienna, Austria.

Vereinigte Berlin Frankfurter Gummiwarenfabrik.—Gelnhausen, Germany.

Vereinigte Gummiwarenfabrik Harburg-Wien.—Harburg-am-Elbe, Germany.

Vereinigte Hanfschlauch und Gummiwarenfabrik, Actiengesellschaft.—Gotha, Germany.

Vezzoni, E., Fabbria Italiana de Pneumatici.—15 via Torino, Milan, Italy.

Vyzelaar & Van den Bergh.—63 Amsterdam, Haarlemmer Hottuin, Holland.

TIRES—SOLID

Batavia Rubber Tire Co.—Batavia, N. Y.

Bergougnan et Cie, Société Générale des Établissements.—9 rue Villaret-de-Joyeuse, Paris, France.

Consolidated Rubber Tire Co.—39 Pine St., main office, New York City.

Continental Caoutchouc & Guttapercha Co.—Hanover, Germany.

Continental, Société Anonyme.—146 ave. Malakoff, Paris, France.

Diamond Rubber Co.—Akron, O.

Engelbert fils et Cie.—29 rue des Vennes, Liege, Belgium.

Falconnet-Perodeaud.—Choisy-le-Roi, France.

Firestone Tire & Rubber Co.—Miller St. and Sweitzer Ave., Akron, O.

Gérard.—36 rue des Guides-Carières, Paris, France.

Goodrich Co., B. F.—Akron, O.

TIRES—SOLID (Continued)

Grammont, A.—Pont-de-Cheruy, Isère, France.
Hartford Rubber Works Co.—691 Park St., Hartford, Conn.
Hopkinson & Co., Ltd., J. E.—121 Cromer St., London, W. C., England.
Houben, Théodore.—Verviers, Belgium.
Indiarubber, Guttapercha & Telegraph Works Co., Ltd.—Persan-Beaumont, Seine-et-Oise, France.
Jenatzy-Leleux, Manufacture Générale de Caoutchouc.—10 rue Stephenson, Brussels, Belgium.
Kokomo Rubber Co.—Kokomo, Ind.
Loze, J. M.—11 ave du Bel-Air, Bois-Colombes, Seine, France.
Michelin et Cie.—15 rue du Nord, Clermont-Ferrand, France.
Morgan & Wright.—Detroit, Mich.
Motz Clincher Tire & Rubber Co.—Akron, O.
N. Y. Belting & Packing Co.—25 Park Pl., New York City.
Oneida Rubber Tire Works.—Oneida, N. Y.
Pneumatic Comptoir.—50 route de la Revolte, Levallois, Seine, France.
Polack, A.—Waltershausen, Thüringen, Germany.
Republic Rubber Co., The.—Youngstown, O.
Shrewsbury & Challiner Tyre Co.—Kay St., Ardwick Green, Manchester, England.
Sider Société Anonyme des Bandages Souples.—66 rue de la Mission-Marchand, Courbevoie, Seine, France.
Société Anonyme des Caoutchoucs de St. Denis.—1 rue Henri-Murger, St. Denis, France.
Société de Fabrication de Bandages Demountables.—23 bvd. Gouvion St. Cyr, Paris, France.
Stein Double Cushion Tire Co.—Akron, Ohio.
Stöckicht, Carl.—Niederrad, bei Frankfurt, Germany.
Sweet Tire and Rubber Co., The.—Batavia, N. Y.
Swinehart Clincher Tire & Rubber Co.—Akron, O.
Torrilhon, Société Anonyme des Etablissements.—Chamalières, Clermont-Ferrand, France.
Trident Tire Co.—1593 Broadway, New York City.
Verdon, E.—20 rue Brunel, Paris, France.
Vereinigte Berliner Frankfurter Gummwarenfabrik.—Gelnhausen, Germany.
Yberty et Merigoux.—Royat, Puy-de-Dôme, France.

TOOL CASES AND KITS, SEE BAGS, TOOLS

TOOLS

Adapt Machinery Co.—1624-34 Wabash Ave., Chicago, Ill.
Armstrong Bros. Tool Co.—104-24 N. Francisco Ave., Chicago, Ill.
Atha Tool Co., The.—Newark, N. J.
Autmo Cabinet Co., The.—Cox Bldg., Rochester, N. Y.
Besley & Co., C. H.—15-21 S. Clinton St., Chicago, Ill.
Billings & Spencer Co.—Hartford, Conn.
Bridgeport Hardware Mfg. Co.—461-69 Iraniston Ave., Bridgeport, Conn.
Bown Machine Wks.—Battle Creek, Mich.
Burnham Co., The Geo.—Worcester, Mass.
Chicago Pneumatic Tool Co.—1010 Fisher Bldg., Chicago, Ill.
Danielson & Co., J. S.—Jamestown, N. Y.
Eaton, Cole & Burnham Co., The.—Bridgeport, Conn.
Frasse & Co., Peter A.—92-4 Fulton St., New York City.
Gisholt Machine Co.—1300 Washington Ave., Madison, Wis.
Goodell-Pratt Co.—Greenfield, Mass.
Hall Co., Chas. E.—108 Broadway, Buffalo, N. Y.
Hammacher, Schlemmer & Co.—133 4th Ave., New York City.
Hatcher Auto Parts Co.—2108 Superior Ave., Cleveland, O.
Hjorth Wrench Co.—Jamestown, N. Y.
Manhattan Storage Co.—1611 Broadway, New York City.
Noonan Tool & Machine Works.—Rome, N. Y.
Norton & Jones Machine & Tool Works.—East Main St., Plainfield, Conn.
Patterson, Gottfried & Hunter, Ltd.—146-150 Centre St., New York City.
Rothenbucher, Geo. E. R.—102 Hinsdale St., Brooklyn, N. Y.
Smith & Co., H. D.—Plantsville, Conn.
Smith & Hemmingway.—296 Broadway, New York City.
Standard Tool Co.—432 Harrison St., Kalamazoo, Mich.
Tower & Lyon Co.—95 Chambers St., New York City.
Universal Tool Co.—54 Taylor St., Springfield, Mass.
Utica Drop Forge & Tool Co.—75 Genesee St., Utica, N. Y.
Vanderbeek Tool Works.—Hartford, Conn.
Walworth Mfg. Co.—128-36 Federal St., Boston, Mass.
Waterbury Tool Co.—Waterbury, Conn.
Whitman & Barnes Mfg. Co.—Ohio.

TOOLS—CH.

Adapt Machinery Co.—1624-34 Ave., Chicago, Ill.

TOOLS—CHAIN (Continued)

- Brown Mfg. & Garage Co., J. C.**—Butler, Ind.
Never Miss Spark Plug Co.—321-323 Michigan Ave. E., Lansing, Mich.

TOOLS—TIRE

- Enterprise Rubber Co.**—110 Federal St., Boston, Mass.
Anderson & Co., F. W.—429 S. Broad St., Philadelphia, Pa. Office, 757 N. Uber St., Philadelphia, Pa.
Auto Improvement Co.—Factory, 316 Hudson St.; Sales and Showrooms, 2128 Broadway, New York City.
Blanchard, A. W.—10 Clinton St., Brooklyn, N. Y.
Elliot & Co., W. J.—185 Franklin St., Boston, Mass.
Empire Automobile Tire Co.—Trenton, N. J.
Goodrich Co., B. F.—Akron, O.
Hancock & Heller.—184-191 Water St., Binghamton, N. Y.
Long & Mann Co.—Beehive Bldg., Graves St., Rochester, N. Y.
Maxwell & Co., L. R.—Cedar Rapids, Iowa.
Morgan & Wright.—Detroit, Mich.
National India Rubber Co.—Bristol, R. I.
Polson, W. F.—22 W. Utica St., Buffalo, N. Y.
Rhodes Mfg. Co.—Grand Rapids, Mich.
Shawrer Co.—Springfield, O.
U. S. Jack Co.—128-30 W. Lake St., Chicago, Ill.

TOPS—AUTOMOBILE AND MOTORBOAT

- Abresch Co., Charles.**—398 Fourth St., Milwaukee, Wis.
American Top Co.—Jackson, Mich.
Anderson & Co., F. W.—429 S. Broad St., Philadelphia, Pa. Office, 757 N. Uber St., Philadelphia, Pa.
Auto Cape Top Co.—1465 Michigan Ave., Chicago, Ill.
Auto Equipment Co., The.—1424-26 Michigan Ave., Chicago, Ill.
Automobile Buggy-Top Co., of America.—Noxen, Pa.
Automobile Equipment Co.—264 Jefferson Ave., Detroit, Mich.
Top Co.—209 E. Columbia St., e, Ind.
aggy Top Co.—Baltimore.
s. Co.—Baum and Beatty Sts., sburg, Pa.
t-Johnson Auto Supply Co., The.—2 Donaldson St., Columbus, O.
, A. M.—441 Elm St., New Haven, in.
r Mfg. Co., M. E.—Utica, N. Y.

TOPS—AUTOMOBILE AND MOTORBOAT (Continued)

- Bliss, Chas. P.**—Denver, Colo.
Blue Ribbon Auto & Carriage Co.—130-70 Cannon St., Bridgeport, Conn.
Bauer Bros.—937 W. 8th St., Cincinnati, Ohio.
Bridgeport Vehicle Co.—Water and South Ave., Bridgeport, Conn.
Briggs Carriage Co.—Amesbury, Mass.
Broc Co.—1665-1667-1669 E. 40th St., 4021-4023 Payne Ave., Cleveland, O.
Brousseau, D.—Sauze-Vaussais, Deux-Sevres, France.
Brown Auto Top Co.—Philadelphia, Pa.
Buffalo Auto Body & Trimming Co.—338 Ellicott St., Buffalo, N. Y.
Buob & Scheu.—408 E. Court St., Cincinnati, O.
Capital Auto Co.—Indianapolis, Ind.
Charlesworth Bodies, Ltd.—Coventry, England.
Chicago Carriage & Trimming Co.—1908 Indiana Ave., Chicago, Ill.
Chicago Coach & Carriage Co.—1223 Michigan Ave., Chicago, Ill.
Cleveland Hardware Co.—1300 Lake St., Cleveland, O.
Cole & Woop.—50 W. 67th St., New York City.
Collins & Son, G. A.—Akron, O.
Collinson, M.—1253 Michigan Ave., Chicago, Ill.
Cray Bros.—1244 W. 9th St., Cleveland, Ohio.
Crescent Auto Top Co.—58 W. 43rd St., New York City.
Curtain Supply Co.—85-93 Ohio St., Chicago, Ill.
Daucher und Mauz.—Stüttgart, Germany.
Demar Co., J. E.—244-48 W. 49th St., New York City.
Denniston, E. E.—184 W. Mohawk St., Buffalo, N. Y.
Detroit Auto Top Co.—Detroit, Mich.
Duane & Co., W. J.—304 W. 54th St., New York City.
Dunham & Son, D. B.—Rahway, N. Y.
Empire Gear & Top Co.—413 N. 22nd St., Philadelphia, Pa.
Everett, B. F.—Detroit, Mich.
Fellwock Automobile & Mfg. Co.—Evansville, Ind.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Fisher, A.—302-310 Fort St. W., Detroit, Mich.
Fitzgibbon & Crisp, Carriage & Auto Body Co.—Trenton, N. J.
Friedrich Wilhelm Bertram Söhne.—Remscheid, Germany.
Flurkey Carriage & Trimming Co.—566 Wabash Ave., Chicago, Ill.
Gallerand, H.—Nogent-le-Rotrou, Eure-et-Loire, France.
Gillotte, G.—88 rue de Villiers, Levallois, Seine, France.

TOPS—AUTOMOBILE AND
MOTORBOAT (Continued)

Graves & Congdon Co.—Oak St., Amesbury, Mass.
Griffault, J.—274 route de la Révolte, Levallois-Perret, France.
Hardware Specialty Mfg. Co.—724 W. 8th St., Anderson, Ind.
Hartford Auto Body Works.—809 Asylum Ave., Hartford, Conn.
Hill Mfg. Co.—25-27 Fuller St., Buffalo, N. Y.
Hodgman Rubber Co.—806 Broadway, New York City.
Holcomb, H. C.—105 Goffe St., New Haven, Conn.
Holmes Bros.—Detroit, Mich.
Hooper & Co., Ltd.—77 Kings Road, Chelsea, London S. W., England.
Hora, E. & H., Ltd.—36 Peckham Road, London S. E., England.
Hume Carriage Co.—Amesbury, Mass.
Indianapolis Buggy Top Co.—2116 S. Meriden St., Indianapolis, Ind.
Irwin Robbins & Co.—32 E. Georgia St., Indianapolis, Ind.
Johnson, A. D.—1446 Wabash Ave., Chicago, Ill.
Karbach Automobile & Vehicle Co.—Omaha, Neb.
Keystone Wagon Works.—Reading, Pa.
King Top Mfg. Co.—Dayton, O.
Kramer & Co., Wm. F.—Canal St., Dayton, O.
Kroh Mfg. Co., C. Z.—Toledo, O.
Lacre Motor Car Co., Ltd.—1-5 Poland St., London W., England.
Larrimore Buggy Top Co.—Baltimore, Md.
Limousine & Carriage Mfg. Co.—35th St., and Michigan Ave., Chicago, Ill.
London Auto Supply Co., The.—1229-31 Michigan Ave., Chicago, Ill.
Loud, Fred A.—Merrimac, Mass.
Manhattan Auto Top & Body Co.—249 W. 64th St., New York City.
Mason, John A.—1312-1316 Washington St., Newton, Mass.
McClellan, Chas. P.—Fall River, Mass.
Meckel, F. L.—77 E. 13th St., Chicago, Ill.
Meryville, F., et G. Garnier.—57 byd. Richard-Lenoir, Paris, France.
Michigan Top Co.—17 Duffield St., Detroit, Mich.
Modern Autotop & Equipment Co.—Ontario St., Cleveland, O.
Morgan & Co., Ltd.—10 Old Bond St., London W., England.
Mount & Bros., J. W.—Red Bank, N. J.
National Auto Top Co.—Main Office, 1904 Broadway, 244-50 W. 49th St., New York City.
Neumeister, Fred P.—Rockford, Ill.
Neveu, J. et Cie.—169 ave du Roule, Neuilly-sur-Seine, France.

TOPS—AUTOMOBILE AND
MOTORBOAT (Continued)

New England Auto Top Co.—229 W. 54th St., New York City.
Newton & Son, W. H.—127 Elm St., Cortland, N. Y.
New York Carriage Top Co.—509 W. 30th St., New York City.
Nichols & Son, D. P.—116-122 W. Brookline St., Boston, Mass.
Nolan, Wm.—541 Tremont St., Boston, Mass.
Paris Auto Top Co.—236 W. 41st St., New York City.
Parsons Buggy Top Co.—Chicago, Ill.
Petzelt & Keyser.—24th and Locust Sts., Philadelphia, Pa.
Quinby & Co., J. M.—21-39 Division St., Newark, N. J.
Racine Novelty Mfg. Co.—600 6th St., Racine, Wis.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Ritter Mfg. Co.—242 Jefferson Ave., Detroit, Mich.
Robertson & Doll.—Denver, Colo.
Rosse Frères.—Breteuil-sur-Iton, Eure, France.
Rosseau.—5 rue Greffulhe, Levallois, Seine, France.
Russell, H. J.—32 Exchange St., Worcester, Mass.
Safety Buggy Co.—Lancaster, Pa.
Schubert Bros. Gear Co.—42-44 Cedar St., Oneida, N. Y.
Shelter Top Co.—1240 N. First St., St. Louis, Mo.
Shields Carriage Co., The.—Amesbury, Mass.
Snow & Co., N. H.—Binghamton, N. Y.
South Broad Automobile Co.—729 South Broad St., Philadelphia, Pa.
Sprague Umbrella Co.—Norwalk, O.
Springfield Auto Top & Upholstering Co.—102-106 Dwight St., Springfield, Mass.
Springfield Metal Body Co.—Birney Ave., Springfield, Mass.
St. Louis Buggy Top Co.—2117-19 N. 9th St., St. Louis, Mo.
Stearns & Co., Walter H.—540-50 W. 58th St., New York City.
Stewart & Co., Hugh.—414 Main St., Cambridgeport, Mass.
Stone & Sc...—67 Ogden St., Chicago, Ill.
Studebaker
 Ave., Chicago.
Teel Mfg. Co.—M
Traugott Golde.—Gera-ke
Troy Carriage Sunshade C
United States Dash & F
 E. 42nd St., New York
Vehicle Top & Sup
 St., St. Louis, Mo.
Vinet et Boulogne.
 Neuilly, Seine, France

**TOPS—AUTOMOBILE AND
MOTORBOAT (Continued)**

- Warner Pole & Top Co.**—1655 Central Ave., Cincinnati, O.
Waugh & Co., Chas.—856-64 Main St., Cambridge, Mass.
Wayman & Murphy.—Randolph and Sangamon Sts., Chicago, Ill.
Weiss & Son, Chas.—4725 Cottage Grove Ave., Chicago, Ill.
Wood & Son, Frederick R.—219 W. 19th St., New York City.

TREADS—TIRE

- Adwear Auto Tire Sleeve Co.**—High and Washington Sts., North Attleboro, Mass.
Akron Mfg. Co.—927 S. High St., Akron, Ohio.
American Tire Co.—Owosso, Mich.
Bailey & Co., C. J.—22 Boylston St., Boston, Mass.
Boston Tire Tread Co.—45 Stanhope St., Boston, Mass.
Buffalo Rubber Mfg. Co.—Sussex Ave. and Erie R. R., Buffalo, N. Y.
Invincible Tire Armor Co.—Hartley, Ia.
Kimball Tire Case Co.—Council Bluffs, Iowa.
M. & M. Mfg. Co.—Akron, O.
Maplebay Mfg. Co.—Crookston, Minn.
Perfect Tire Co.—Rock Rapids, Ia.
Quincy Manchester Sargent Co.—84 Van Buren St., Chicago, Ill.
Republic Rubber Tire & Shoe Co., The.—449 W. 53rd St., New York City.
Samson Leather Tire Co.—1634-42 Broadway, New York City.
S. C. Fabric Tire Tread Co.—1900 Broadway, New York City.
Slama Tire Protector Co.—Humbolt, Neb.

TRICAR MFRS.

- Anglian Motor Co., Ltd.**—Beccles, England.
Austral, Société Anonyme'l.—8 rue du Debarcadère, Paris, France.
Bird & Co., W. Hobart.—Coventry, England.
Chater Lea, Ltd.—114 Golden Lane, London E., England.
Chauvierre, E.—29 rue Chevalier, Levallois, France.
Contal.—64 ave de la Grande Armée, Paris, France.
Cottureau Etablissements.—Lentillieres, Dijon, France.
de Dion, Bouton et Cie.—Quai National, Puteaux, France.
Gaud Frères.—Juvisy, Seine-et-Oise, France.
Gross, J.—rue de la Mare, Paris, France.
Heusch, Louis.—31 rue du Marche, Paris, France.
Humber, Ltd.—Beeston, Nottingham, England.

TRICAR MANUFACTURERS

- Ivry Car & Motor Works.**—15 Victoria St., Westminster, London, England.
Lagonda Motor Mfg. Co.—Coventry, England.
Laurin et Klement, Slavia Fahrradwerke.—Jungbunzlau, Bohemia, Austria.
Mallet, E.—10 rue Denis-Papin, Tours, France.
Marchand-Dufaux, Fabbrica Italiani di Vetture Automobili.—Plaisance, Italy.
Mom Ateliers de Constructions Mécaniques.—173 bvd. Péreire, Paris, France.
Nacke, E.—Coswig, Saxony, Germany.
Neckarsulmer Fahrradwerke.—Neckarsulm, Württemberg, Germany.
Peugeot Frères, les fils de.—Valentigney, Doubs, France.
Phänomen Fahrradwerke, Gustav Hüller.—Zittau, Germany.
Phoenix Motors, Ltd.—Blundell St., Caledonian Road, London N., England.
Prestwich & Co., John A.—1 Landsdowne Road, Tottenham, London W., England.
Rex Motor Mfg. Co., Ltd.—Coventry, England.
Riley Cycle Co., Ltd.—City Works, Coventry, England.
Sarolea, Maison.—269 rue St. Lambert, Herstal, Belgium.
Singer Motor Co., Ltd.—Coventry, England.
Sotomayor.—19 bvd. Bourdon, Paris, France.
Stuart et Stichter.—20 rue d'Armenonville, Neuilly, France.
Süddeutsche Automobifabrik Gaggenau.—Gaggenau, Germany.
Suère.—73 rue Claude-Decaen, Paris, France.
Wander - Fahrradwerke Actiengesellschaft.—Schönau bei Chemnitz, Germany.
Zenith Motor Engineering Co.—101 Stroud Green Road, Finsbury Park, London, England.
- TRIMMINGS—CLOTH & CARPET**
Adams, Wm. F.—339 Broadway, New York City.
Bridgeport Coach Lace Co.—805 Wood Ave., Bridgeport, Conn.
Broc Co.—1665-1667-1669 E. 40th St., and 4021-4023 Payne Ave., Cleveland, O.
Carr, F. S.—74 Pearl St., Boston, Mass.
Chandler Oil Cloth & Buckrum Co.—East Taunton, Mass.
Dusenbury, Louis.—86-88 Worth St., New York City.
Everett, B. F.—Detroit, Mich.
Gerhab, Jacob.—158-164 N. 3rd St., Philadelphia, Pa.
Halliday, C. A.—42 Cedar St., Oneida, N. Y.
Horstman Co., Wm. H.—5th Ave. and Cherry Sts., Philadelphia, Pa.

**TRIMMINGS—CLOTH AND
CARPET (Continued)**

Hutchinson & Co., W. R.—15 Caledonia Ave., Rochester, N. Y.
Kroh Mfg. Co., C. Z.—Toledo, O.
Laidlaw, Jr., Wm. R.—1771 Broadway, New York City.
Landers Bros. Co.—445 Tenth St., Toledo, O.
Manufacturers' Selling Co.—1777 Broadway, New York City.
Metal Stamping Co.—243 West St., New York City.
Monarch Rubber Co.—41 N. 7th St., Philadelphia, Pa.
National India Rubber Co.—Bristol, R. I.
Pantasote Co., The.—11 Broadway, New York City.
Raritan Woolen Mills.—14 White St., New York City.
Roehm & Davison, Ltd.—91-95 W. Woodbridge St., Detroit, Mich.
Roy & Co., James.—Watervleit, N. Y.
Schofield, Mason & Co.—Fairhill, Reese and Cumberland Sts., Philadelphia, Pa.
Slater & Sons, S.—47 Worth St., New York City.
St. Louis Buggy Top Co.—2117-19 N. 9th St., St. Louis, Mo.
Tiel & Co., Geo.—413 Arch St., Philadelphia, Pa.
Tingue Mfg. Co.—Seymour, Conn.
Ventilated Cushion & Spring Co.—Jackson, Mich.
Vogt Mfg. & Coach Lace Co.—322-24 St. Paul St., Rochester, N. Y.
Waterloo Woolen Mfg. Co.—Waterloo, N. Y.

TRIMMINGS—METAL

American Auto Brass Co.—181 W. Maple St., Columbus, O.
American Foundry & Mfg. Co.—Herbert and Wright Sts., St. Louis, Mo.
Amesbury Brass & Foundry Co.—Amesbury, Mass.
Atwood Mfg. Co.—Amesbury, Mass.
Barlow Mfg. Co.—Holyoke, Mass.
Blakeslee Mfg. Co.—Plantsville, Conn.
Columbus Bolt Works.—162 W. Randolph St., Columbus, O.
Cowles & Co., C.—New Haven, Conn.
Cortland Carriage Goods Co.—Cortland, N. Y.
Cortland Forging Co.—Cortland, N. Y.
Coops, C. W.—3 Appleton St., Boston, Mass.
Cray Bros.—1244 W. 9th St., Cleveland, Ohio.
English & Mersick Co.—New Haven, Conn.
Globe Brass Works.—13-15 Macomb St., Detroit, Mich.
Harper Co., Walter J.—229-231 Mulberry St., Newark, N. J.
Kelley Maus & Co.—1-5 W. Lake St., Chicago, Ill.

TRIMMINGS—METAL (Continued)

Metal Stamping Co.—243 West St., New York City.
Murdock Co., James, Jr.—116 Opera Pl., Cincinnati, O.
Murphy Co., G. W. J.—Merrimac, Mass.
Neider Co., Inc., The F. A.—Augusta, Ky.
Non-Corrosive Metal Works, Inc.—Watertown, Mass.
Rands Mfg. Co.—51-55 Macomb St., Detroit, Mich.
Scherer & Co., H.—Detroit, Mich.
Seward & Son Co., M.—New Haven, Conn.
Taylor Co., H. D.—101-105 Oak St., Buffalo, N. Y.
Victor Metal Co.—29 Broadway, New York City.
White Mfg. Co.—Cannon St., Bridgeport, Conn.

TRUNKS

A. Z. Co., The.—527 W. 56th St., New York City.
Boyle & Co., John.—112-114 Duane St., New York City.
Taylor Trunk Co., C. A.—39 Randolph St., Chicago, Ill.
Connecticut Steel & Wire Co.—308 Pearl St., Hartford, Conn.
Fuller Co., The G. W.—182 Asylum St., Hartford, Conn.
Haskell Bros.—Washington and Wabash Aves., Chicago, Ill.
Mason, John A.—1312-1316 Washington St., Newton, Mass.
Nolan, Wm.—541 Tremont St., Boston, Mass.
Sage's Trunk Depot.—Boston, Mass.
Taylor Trunk Co., C. A.—39 Randolph St., Chicago, Ill.
Warren Leather Goods Co.—80 Austin St., Worcester, Mass.
Winship, W. W.—71 Summer St. and 111 Kingston St., Boston, Mass.

TUBES—INNER

Automobile Utilities Co.—9 Motor Mart, Boston, Mass.
Buffalo Rubber Mfg. Co.—Sussex Ave. and Erie R. R., Buffalo, N. Y.
Continental Caoutchouc Co.—43 Warren St. and 2100 Broadway, New York City.
Continental Rubber Works.—Liberty Sts., Erie, Pa.
Dow Tire Co.—104 W. 42nd York City, Factory; Bush No. 2, Foot 36th St., South N. Y.
Electric Rubber Mfg. Co.—N. J.
Empire Automobile Tire—N. J.
Gaulios Tire Co.—1739 York City.

TUBES—INNER (Continued)

- Healy Leather Tire Co.**—90 Gold St., New York City.
Martin Evans Co.—1186 Bedford Ave., Brooklyn, N. Y.
Michelin Tire Co.—Milltown, N. J.
Morgan & Wright.—Detroit, Mich.
Nathan Novelty Mfg. Co.—88 Reade St., New York City.
National India Rubber Co.—Bristol, R. I.
Parker, Stearns & Co.—228-29 South St., New York City.
Pennsylvania Rubber Co.—Jeannette, Pa.
Trenton Rubber Mfg. Co.—Trenton, N. J.
Victor Auto Tire Repair Co., The.—Passaic, N. J.

TUBING—ALUMINUM, BRASS AND COPPER

- American Tube Works.**—137 Milk St., Boston, Mass.
Ansonia Brass & Copper Co.—99 John St., New York City.
Benedict & Burnham.—Waterbury, Conn.
Bridgeport Brass Co.—Bridgeport, Conn.
Briscoe Mfg. Co.—Detroit, Mich., and Newark, N. J.
Chicago Brass Co.—Kenosha, Wis.
Coe Brass Mfg. Co.—Torrington, Conn.
Dallas, A. C.—36 LaSalle St., Chicago, Ill.
Detroit Space, Copper & Brass Rolling Mills.—Detroit, Mich.
French Mfg. Co.—Grandview Ave. and Robbins St., Waterbury, Conn.
Imperial Brass Mfg. Co.—245-47 S. Jefferson St., Chicago, Ill.
Ivins Tube Works, Ellwood.—Oak Lane Station, Philadelphia, Pa.
Long Mfg. Co.—1430-34 Michigan Ave., Chicago, Ill.
New Jersey Tube Co.—Newark, N. J.
Patterson, Gottfried & Hunter, Ltd.—146-150 Centre St., New York City.
Randolph-Clowes Co.—Waterbury, Conn.
Rome Brass & Copper Co.—Rome, N. Y.
Simmons Co., John.—104-110 Centre St., New York City.
Smith Co., A. O.—Park and Clinton Sts., Milwaukee, Wis.
Standard Metalwork Co.—Thompsonville, Conn.
Tripari Bros. & V. De Prisco Co.—Office, 111 St.; Factory, cor. Broome St., New York City.
Brass Co.—Waterbury, Conn.
A. H.—Watertown Road, Watertown, Conn.

TUBING—FLEXIBLE

- Supply Mfg. Co.**—139-147 Myrtle Place, Brooklyn, N. Y.
Walter L.—St. Louis, Mo.

TUBING—FLEXIBLE (Continued)

- International Auto Horn Mfg. Co.**—151 E. 126th St., New York City.
Lippincott Steam Specialty & Supply Co., The.—Newark, N. J.
Lombardi Motor Co., The.—Derby, Conn.
Smith & Co., Albanus L.—1305 Arch St., Philadelphia, Pa. Importer.

TUBING—RUBBER

- Boston Woven Hose & Rubber Co.**—29 Hampshire St., Cambridge, Mass.
Empire Rubber Mfg. Co.—Trenton, N. J.
New Jersey Car Spring & Rubber Co.—Wayne and Brunswick Sts., Jersey City, N. J.
Pennsylvania Rubber Co.—Jeannette, Pa.
Winn, Wm. R.—143 Maiden Lane, New York City.

TUBING—STEEL

- American Tube & Stamping Co.**—Bridgeport, Conn.
Delaware Seamless Tube Co.—Auburn, Pa.
Detroit Seamless Steel Tube Co.—833 River St., Detroit, Mich.
Ivins' Tube Works, Elwood.—Oak Lane Station, Philadelphia, Pa.
Leng's Son & Co., John S.—33 Murray St., New York City.
Laminated Tube Co.—Columbus, O.
National Tube Co.—McKeesport, Pa.
Pittsburg Seamless Tube Co.—Beaver Falls, Pa.
Shelby Steel Tube Co.—Pittsburg, Pa.
Seamless Tube Co. of America.—Frick Bldg., Pittsburg, Pa.
Spang, Chalfant & Co.—Pittsburg, Pa.
Standard Welding Co., The.—Cleveland, Ohio.
Ward & Sons, Edgar T.—23-25 Purchase St., Boston, Mass.

TURNTABLES

- Auto Supply & Storage Co.**—Baltimore, Md.
Bicycle Step Ladder Co., The.—63 Randolph St., Chicago, Ill.
Coates Clipper Mfg. Co.—Worcester, Mass.
Columbus Screw & Machine Co.—Columbus, O.
Ernst's Sons, C. F.—75 Lathrop St., Buffalo, N. Y.
Fellwock Automobile & Mfg. Co.—Evansville, Ind.
Gibbs-Brower Co.—150 Nassau St., New York City.
Link Belt Co.—Chicago, Ill.
North Penn Iron Co., The.—Third and Venango Sts., Philadelphia, Pa.
Pitless Turntable Co.—Kansas City, Mo.

TURNTABLES (Continued)

Smith Machine Co., H.—51 Godwin St., Patterson, N. J.
Weber Cycle & Supply Co.—Colorado Springs, Colo.

UPHOLSTERING

Anderson & Co., F. W.—429 S. Broad St., Philadelphia, Pa. Office. 757 N. Uber St., Philadelphia, Pa.
Buffalo Auto Body & Trimming Co.—338 Ellicott St., Buffalo, N. Y.
Fickling & Co., Inc.—154 E. 57th St., New York City.
Wing & Co., Charles.—Amesbury, Mass.

VALVE CONNECTIONS — TIRE, PUMP

Goodrich Co., B. F.—Akron, O.
Kellogg, G. W.—9 Belmont St., Rochester, N. Y.
Park City Brass Co.—Springfield, Mass.

VALVE-STEMS

Cambria Forge Co.—Cleveland, O., and Johnstown, Pa.
Standard Connecting Rod Co.—Beaver Falls, Pa.
Williams & Co., J. H.—Brooklyn, N. Y.

VALVES—CHECK

Cleveland Cap Screw Co.—2216 Clarkwood Road, Cleveland, O.
Hatcher Auto Parts Co.—Cleveland, O.
Jannet Steinmetz & Co.—Fourth and Market Sts., Philadelphia, Pa.
Lee Mfg. Co., The.—Conners St., Port Huron, Mich.
Morgan, B.—Old Beach Road, Newport, R. I.
Turner Brass Works, The.—72 Michigan St., Chicago, Ill.
Walker & Co., E. C.—1913-23 Logan St., Louisville, Ky.

VALVES—INLET AND EXHAUST

Ashton Valve Co.—271 Franklin St., Boston, Mass.
Cleveland Cap Screw Co.—Cleveland, O.
Eaton, Cole & Burnham Co., The.—Bridgeport, Conn.
Gray-Hawley Mfg. Co.—605-609 W. Fort St., Detroit, Mich.
Lunkenheimer Co., The.—Cincinnati, O.
Morgan, B.—Old Beach Road, Newport, R. I.
Standard Gauge Mfg. Co.—Syracuse, N. Y.
Standard Welding Co.—Cleveland, O.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, O.

VALVES—NEEDLE

Boston Steam Specialty Co.—168-70 Congress St., Boston, Mass.
Lunkenheimer Co., The.—Cincinnati, O.

VALVES—SAFETY

American Steam Gauge & Valve Co.—Jamaica Plain, Boston, Mass.
Artizan Brass Co.—204 Lincoln Park Boulevard, Chicago, Ill.
Ashton Valve Co.—271 Franklin St., Boston, Mass.
Crosby Steam Gauge & Valve Co.—97 Oliver St., Boston, Mass.
Lonergan & Co., J. E.—211-15 Race St., Philadelphia, Pa.
Pittsburg Gauge & Supply Co.—309 Water St., Pittsburg, Pa.
Simmons Co., John.—104-110 Center St., New York City.
Standard Gauge Mfg. Co.—Industrial Bldg., Syracuse, N. Y.
Star Brass Mfg. Co.—108-114 E. Dedham St., Boston, Mass.
Western Tube Co.—Kewanee, Ill.
Williams Valve Co., D. T.—904-10 Broadway, Cincinnati, O.

VALVES—TIRE

Buck, L. K.—Freehold, N. J.
Holmes & Bros., Robt.—Danville, Ill.
Scoville Mfg. Co.—Waterbury, Conn.
Standard Valve Co.—163 Hawthorne Ave., Brooklyn, N. Y.
Tire Safety-Device Co.—214 W. 124th St., New York City.

VALVES—THROTTLE

Kero-Steam Co., (Waite & Son Co.).—102 Fulton St., New York City; Factory, East Orange, N. J.
Locke Regulator Co.—76 North St., Salem, Mass.
Lonergan & Co., J. E.—211-15 Race St., Philadelphia, Pa.
Nolte Brass Co.—Springfield, O.
Powell Co., William, The.—2525-31 Spring Grove Ave., Cincinnati, O.
Vincent Valve Co., The.—Sandusky, Ohio.
Walker & Co., E. C.—1913-23 Logan St., Louisville, Ky.
Williams Valve Co., D. T.—904-10 Broadway, New York City.

VARNISHES

Acme White Lead & Color Works.—Detroit, Mich.
Adams & Elting Co.—155 W. Washington St., Chicago, Ill.
Armitage & Co., John L.—54 Dawson St., Newark, N. J.
Babcock Varnish Co.—Boston, Mass.
Baum's Castorine Co.—104 W. George St., Rome, N. Y.
Beckwith Chandler Co.—320 5th Ave., New York City; 201 Emmett St., Newark, N. J.

VARNISHES (Continued)

Berry Bros., Ltd.—Detroit, Mich.
Billings-Chapin Co., The.—Cleveland, O.
Boston Varnish Co.—Everett Sta., Boston, Mass.
Calman & Co., Emil.—229 Pearl St., New York City.
Century Mfg. Co.—272 W. Genesee St., Buffalo, N. Y.
Chase, Roberts & Co.—West Ave. and 5th St., Long Island City, N. Y.
Chicago Varnish Co.—Dearborn Ave. and Henzie St., Chicago, Ill.
Cleveland Varnish Co.—Cleveland, O.
Columbus Varnish Co.—Columbus, O.
Detroit White Lead Works.—532 Milwaukee Ave., Detroit, Mich.
Devoe, F. W. & C. T. Reynolds Co.—Fulton and Williams Sts., New York City.
Ditzler Paint & Color Co.—18 Baltimore Ave., West Detroit, Mich.
Felton, Sibley & Co.—136-140 N. 4th St., Philadelphia, Pa.
Flood & Conklin Co.—136 Chestnut St., Newark, N. J.
Gillespie & Sons, Chas. H.—125 Dey St., Jersey City, N. J.
Glidden Varnish Co.—Rockfellow Bldg., Cleveland, O.
Hildreth Varnish Co.—32 Broadway, New York City.
Lucas & Co., John.—Philadelphia, Pa.
Lilly Varnish Co.—670 Rose St., Indianapolis, Ind.
Massachusetts Chemical Co.—Walpole, Mass.
Masury & Son, John W.—44-50 Jay St., Brooklyn, N. Y.
McDougall Varnish Co.—1317 Elk St., Buffalo, N. Y.
Minett Varnish Co.—129 Pearl St., New York City.
Murphy Varnish Co.—Chestnut and McWhorter Sts., Newark, N. J.
Niagara Surface Coating Co.—Erie and Ninth Sts., Niagara Falls, N. Y.
Nice, Eugene E.—272-274 S. Second St., Philadelphia, Pa.
Oriental Varnish Co.—72 Midwood St., Brooklyn, N. Y.
Parrot Varnish Co.—Bridgeport, Conn.
Patterson-Sargent Paint Co.—Cleveland, Ohio.
Payson Varnish Co.—141st St. and Walnut Ave., New York City.
Perrin Varnish Co.—1133 Broadway, New York City.
Pratt & Lambert.—79 Tonawanda St., Buffalo, N. Y.
Rubber Paint Co.—154-156 W. Van Buren St., Chicago, Ill.
Schrack & Co., C.—152 N. 4th St., Philadelphia, Pa.
Sherwin, Williams Co., The.—601 Canal Road, N. W. Cleveland, O.

VARNISHES (Continued)

Smith, Edward & Co.—45 Broadway, New York City.
Standard Varnish Works.—29 Broadway, New York City.
Stewart-Mowhy Co.—3214 Shields Ave., Chicago, Ill.
Valentine & Co.—257 Broadway, New York City.
Willey, C. A.—Hunters Point, New York City.
Watts De Golyer Co., The.—377 Illinois St., Chicago, Ill.
Western Reserve Varnish Co.—Marquette St., Cleveland, O.

VICES

Autmo Cabinet Co., The.—Cox Bldg., Rochester, N. Y.
Emmert Mfg. Co.—Waynesboro, Pa.
Graham Mfg. Co.—Providence, R. I.
Maxson Vulcanizing Works.—125 W. Main St., Rochester, N. Y.
Pittsburg Automatic Vise & Tool Co.—Wabash Bldg., Pittsburg, Pa.
Potter and Johnson Machine Co.—Pawtucket, R. I.
Whitney Mfg. Co.—Hartford, Conn.

VOLTMETERS

American Electrical Novelty & Mfg. Co.—308 Hudson St., New York City.
Atwater Kent Mfg. Works.—50 N. 6th St., Philadelphia, Pa.
Auto Specialty Co.—6 E. Madison St., Chicago, Ill.
Connecticut Telephone & Electrical Co., Inc.—70 Britannia St., Meriden, Conn.
Eastern Carbon Works.—West Bergen, Jersey City, N. J.
Eldredge Electric Mfg. Co.—7 Post Office Square, Springfield, Mass.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
Keystone Electrical Instrument Co.—9th St. and Montgomery Ave., Philadelphia, Pa.
Monarch Instrument Co.—Cleveland, O.
More-Power Co.—619 Graham St., Lowell, Mass.
National Carbon Co.—Lock Drawer L., Cleveland, O.
Norton Electrical Instrument Co.—Manchester, Conn.
Pignolet, Louis M.—78 Cortlandt St., New York City.
Pocket Meter Co.—Bluffton, O.
Queen & Co., Inc.—8th and Arch Sts., Philadelphia, Pa.
Robert Instrument Co., The.—56 Shelby St., Detroit, Mich.
S. E. I. Co.—Syracuse, N. Y.
Stackpole Battery Co.—St. Mary's, Pa.
Stanley Elec. Mfg. Co.—Pittsfield, Mass.
Sterling Mfg. Co.—416 American Trust Bldg., Cleveland, O.

VOLTMETERS (Continued)

- Talmon Electrical Engineering Co.**—88-90 Centre St., New York City.
Wagner Electrical Mfg. Co.—St. Louis, Mo.
Weston Electrical Instrument Co.—Waverly Park, Newark, N. J.
Western Electric Co.—259 S. Clinton St., Chicago, Ill.
Westinghouse Electric & Mfg. Co.—Pittsburg, Pa.
Whitney Electrical Instrument Co.—Concord, N. H.
Williams, E. Q.—533 S. Clinton St., Syracuse, N. Y.

VOLTAMMETERS

- Auto Specialty Co.**—6 E. Madison St., Chicago, Ill.
Keystone Electrical Instrument Co.—9th St. and Montgomery Ave., Philadelphia, Pa.
Never Miss Spark Plug Co.—321-23 Michigan Ave., E., Lansing, Mich.
Pignolet, Louis N.—78 Cortlandt St., New York City.
Sterling Mfg. Co.—416 American Trust Bldg., Cleveland, O.

VULCANIZERS

- Akron Pneumatic Tire & Protector Co.**—Akron, O.
Arnstein, Eugene.—45th and Shields Ave., Chicago, Ill.
Auto Improvement Co.—Factory, 316 Hudson St.; Sales and Show Rooms, 2128 Broadway, New York City.
Auto Tire Vulcanizing Co.—Factory, 689 Lawrence St.; Office, Plain St., Lowell, Mass.
Shaler Co., C. A.—Waupun, Wis.
Stitch-in-Time Vulcanizer Co.—Topeka, Kansas.
Wishart Machine Works, John.—63-65 S. Canal St., Chicago, Ill.

VULCANIZING AND TIRE REPAIRS

- Ajax Rubber Co. of Philadelphia.**—1413 Race St., Philadelphia, Pa.
Alsten & Goulding.—36 Forster St., Worcester, Mass.
Austin & Co., Robert.—227 Pacific St., Brooklyn, N. Y.
Auto Tire & Repair Station.—5918 Baum St., Pittsburg, Pa.
Automobile Tire Co.—1578 Broadway, New York City.
Broadway Rubber Works.—1900 Broadway, New York City.
Cain, Frank.—202 Fourth Ave., Detroit, Mich.
Campbell Auto Tire Co.—1st and Adams Sts., Marion, Ind.
Central Tire Co.—Central Ave. and Halsey St., Newark, N. J.

VULCANIZING AND TIRE REPAIRS (Continued)

- Chanslor & Lyon Motor Supply Co.**—542-56 Golden Gate Ave., San Francisco, Cal.
Chicago Tire Repair Co.—35th and Michigan Ave., Chicago, Ill.
Chicago Vulcanizing Co.—1461-63 Michigan Ave., Chicago, Ill.
Continental Caoutchouc Co.—43 Warren St., 2100 Broadway, New York City.
Dryden Rubber Tire Co.—449 Wabash Ave., Chicago, Ill.
Eclipse Auto Rubber Tire Repairing Co.—305 Clifton Place, Brooklyn, N. Y.
Empire State Tire Co.—Buffalo, N. Y.
Jones & Co., Howard T.—602 E St., N. W., Washington, D. C.
Jones, Geo. L.—910 S. Walnut St., Muncie, Ind.
Keaton & Chevalier.—521 Van Ness Ave., San Francisco, Cal.
Kelsey & Kelsey.—25 Hamilton St., Albany, N. Y.
Meyers & Greyson.—1608 Broadway, New York City.
Miller, Chas. E.—1235 S. Meridan St., Anderson, Ind.
Model Vulcanizing Co.—1547 Michigan Ave., Chicago, Ill.
Monarch Vulcanizing Works.—26 Rush St., Chicago, Ill.
Murphy & Co., Thos. J.—119 S. Parsons Ave., Columbus, O.
New York Steam Rubber Tire Repair Works.—306 W. 52nd St., New York City.
O'Connor, M.—201 W. 48th St., New York City.
Oriental Rubber Co.—1140 Bedford Ave., Brooklyn, N. Y.
Paterson Auto Tire Repairing Company.—198 Ellison St., Paterson, N. J.
Pittsburg Auto Tire Repair Co.—Baum and Whitfield Sts., Pittsburg, Pa.
Rosenbeck, H.—242 Halsey St., Newark, N. J.
Rubber Tire Repair Co.—85 E. Gay St., Columbus, O.
Samuels, A. L.—Bloomington, Ill.
Shaw, Frank.—260 N. Broad St., Philadelphia, Pa.
Snowden, W. T.—86 Bedford Ave., Brooklyn, N. Y.
Standard, I. D.—9 A Me.
Standard Rubber Ti
 St., Philadelphia, .
Topeka Automobile
 and Quincy Sts., Topeka, .
Universal Tire Repair Co.
 way, New York City.
Vulcan Tire Repair Co.—21 . . .
 New York City.

WASHERS

American Iron & Steel Mfg. Co.—Lebanon, Pa.
Armstrong Cork Co.—23rd St. and A. V. Ry., Pittsburg, Pa.
Clark & Son, A. N.—Plainville, Conn.
Clark Bros. Bolt Co.—Milldale, Conn.
Fluke, F. S.—6036 Woodland Ave., Chicago, Ill.
Galvanizing Co.—525 N. Front St., Philadelphia, Pa.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
Positive Lock Washer Co.—Newark, N. J.
Schoonmaker, A. O.—221 Fulton St., New York City.
Stimpson & Son, E. B.—31 Spruce St., New York City.
Upson Bolt & Nut Co.—Cleveland, O.

WASHERS—FELT

Bowen Mfg. Co.—Canal St., Auburn, N. Y.
Braunsdorf, Geo. W.—309 E. 43rd St., New York City.

WASHERS—LEATHER

Bowen Mfg. Co.—Canal St., Auburn, N. Y.
Picrome Hide Co.—1417 N. Salina St., Syracuse, N. Y.
Wolverine Leather Goods Co.—59 E. Fort St., Detroit, Mich.

WASHERS—LOCK

Allison Mfg. Co.—Philadelphia, Pa.
Hartford Machine Screw Co.—476 Capital Ave., Hartford, Conn.
"It" Locknut Concern.—515 63rd St., Chicago, Ill.
National Elastic Nut Co.—Milwaukee, Wis.
National Lock Washer Co.—65-69 Johnson St., Newark, N. J.
National Sewing Machine Co.—Belvidere, Ill.
New Jersey Car Spring & Rubber Co.—Wayne and Brunswick Sts., Jersey City, N. J.
Packard Electric Co.—399 North Ave., Warren, O.
Peninsular Milled Screw Co.—751 Belle-Detroit, Mich.
Washer Co.—Newark, Lock Co.—432 E. 71st St., City.

WASHERS—MICA

Mica Co.—Asheville, N. C.
Mica Mfg. Co.—307 W. Broadway, New York City.
Mica Co., D. T.—Plumtree, N. C.

WASHING APPARATUS—VEHICLE

Connecticut Supply Co.—Hartford Life Ins. Bldg., Hartford, Conn.
Ideal Carriage Washer Co.—383 Main St. E., Rochester, N. Y.
Nicholson Mfg. Co., H.—68 Dey St., New York City.
Orient Mfg. Co.—537 Albany St., Boston, Mass.
Ryan & Long.—584 Oneida St., Appleton, Wis.
Vehicle Specialty Co.—32 Union Place, Hartford, Conn.

WEARING APPAREL—CAPS AND HATS

Belle—Jardinère Magazines de la.—2 rue du Pont Neuf, Paris, France.
Demmerle & Co.—248 W. 23rd St., New York City.
Deniau et Cie.—86 bis, rue de Rome, Paris, France.
Detroit Cap Mfg. Co.—11-17 Woodbridge St., W. Detroit, Mich.
Dinner Co., Isaac H.—78 Bedford St., Boston, Mass.
Dunhill, Ltd., Alfred.—2 Conduit St., London W., England.
Gamage, Ltd., A. W.—Holborn, London E. C., England.
Hyam & Co., Ltd.—134 Oxford St., London W., England.
Kibbe, C. S.—Batavia, N. Y.
Lasky & Levy.—20-22 Waverly Pl., New York City.
Lilley & Co., M. C.—Columbus, O.
Maxfield & Co., Glen C.—170 E. Madison St., Chicago, Ill.
Monjardet.—21 rue Richelieu, Paris, France.
Pontiac Knitting Co.—Pontiac, Mich.
Revillon Frères, Inc.—19 W. 34th St., New York City.
Roddy.—2 bvd. des Italiens, Paris, France.
Saks & Co.—Broadway, 33rd to 34th Sts., New York City.
Scandinavian Fur & Leather Co.—16 W. 33rd St., New York City.
Shaw, Ora D.—109 Kingston St., Boston, Mass.
Spear Martin Fur Co.—41 Church St., Burlington, Vt.
Springfield Hat & Cap Co.—27-35 Taylor St., Springfield, Mass.
Stall & Dean Mfg. Co.—Brockton, Mass.
Ström.—16 rue de la Chaussée d'Antin, Paris, France.
Wanckel Manfred.—640 Madison Ave., New York City.

WEARING APPAREL—COATS

Aquascutum Ltd.—100 Regent St., London W., England.
Automobilia Ltd.—532 Oxford St., London W., England.

WEARING APPAREL—COATS
(Continued)

- Belle-Jardinère, Magazins de la.**—2 rue du Pont Neuf, Paris, France.
Bernard.—39 rue du Sentier, Paris, France.
Bon Marché, Grands Magazins du.—rue de Sevres, Paris, France.
Burberrys.—30 Haymarket, London, England.
Crabette.—92 rue Richelieu, Paris, France.
Dugas.—10 bvd. Sevastopol, Paris, France.
Dunhill Ltd., Alfred.—2 Conduit St., London, England
Fashionable House.—16 bvd. Montmartre, Paris, France.
Fraenkel.—28 rue du Quatre Septembre, Paris, France.
Gamage, Ltd., A. W.—Holborn, London E. C., England.
Heagle, James.—Corner First and Market Sts., Johnstown, N. Y.
Hodgman Rubber Co.—806 Broadway, New York City.
Hyam & Co., Ltd.—134 Oxford St., London W., England.
Louvre, Grands Magazins du.—164 rue de Rivoli, Paris France.
Maison Gérard.—15 place de la République, Paris, France.
Mann Co., Leon.—699 Broadway, New York City.
Monjardet.—21 rue Richelieu, Paris, France.
National Casket Co.—New York City, Boston, Philadelphia, Baltimore, Pittsburgh, Nashville, Louisville, Indianapolis, Rochester, Albany, Buffalo and Chicago.
Nicoll & Co., Ltd., H. J.—22 Cornhill, London E. C., England.
Piggott, Ltd., John.—117 Cheapside, London E. C., England.
Revillon frères.—79 rue de Rivoli, Paris, France.
Robinson & Cleaver, Ltd.—Regent St., W., London, England.
Roddy.—2 bvd. des Italiens, Paris, France.
Samaritaine, Grands Magazins de la.—rue du Pont-Neuf, Paris, France.
Schneider, et Cie.—16 rue de la Chaussée d'Antin, Paris, France.
Ström.—16 rue de la Chaussée, Paris, France.
Vigo et Cie.—24 via Maria Vittoria, Turin, Italy.
Williams et Cie.—1 rue Caumartin, Paris, France.

WEARING APPAREL—FUR CAPS AND HATS

- Casasco Alessandro.**—19 via San Secondo, Turin, Italy.
Gay, Tony.—Thoissey, Ain, France.

WEARING APPAREL—FUR CAPS AND HATS (Continued)

- Max, Wormser.**—25 rue Vivienne, Paris, France.
Ström.—16 chausse d'Antin, Paris, France.
Weill, H.—36 rue de Clery, Paris, France.

WEARING APPAREL—FUR COATS

- Adam.**—Leipzigerstrasse, 27, Berlin, Germany.
Casasco, Alessandro.—19 via San Secondo, Turin, Italy.
Dunhill, Ltd., Alfred.—2 Conduit St., London W., England.
Gamage, Ltd., A. W.—Holborn, London E. C., England.
Gausset, Fernand.—5 rue du Jardin-Botanique, Liege, Belgium.
Herzog, Rudolph.—Breitestrasse 15, Berlin, Germany.
Magne, Auguste.—Moulins, Allier, France.
Maison des Sports.—46 rue du Midi, Brussels, Belgium.
Simpson & Price.—45 John Dalton St., Manchester, England.
Spear Martin Fur Co.—41 Church St., Burlington, Vt.
Villeneuve, U.—Aubenas, Ardeche, France.
Willas, August.—Eisenach, Germany.

WEARING APPAREL—GLOVES AND GAUNTLETS

- Allen & Son, John C.**—Gloversville, N. Y.
American Glove Co., The.—18 Churchill St., Chicago, Ill.
Beloit Glove & Mitten Co.—217 Grand Ave., Beloit, Wis.
Chicago Auto Robe Supply Co.—159 Market St., Chicago, Ill.
Clark Glove Co., The.—Peabody, Mass.
Crosby Frisian Fur Co.—116 Mill St., Rochester, N. Y.
Demmerle & Co.—248 W. 23rd St., New York City.
Detroit Leather Specialty Co.—Detroit, Mich.
Eisendrath Glove Co.—Armitage and Elston Ave., Chicago, Ill.
Ellsworth & Thayer Mfg. Co.—Milwaukee, Wis.
Hansen Mfg. Co., C
 St., Milwaukee, W
Kibbe, C. S.—Batavia
Morowetz Co.—Milw
Morrison, McIn
 St., Grinnell, I
Pontiac Knitting
Revillon Frères, Ir
 New York City.
Ripon Knitting W
Scandinavian Fur & Lce
 33rd St., New York Ci

**WEARING APPAREL—GLOVES
AND GAUNTLETS (Continued)**

- Southern California Glove Co., Inc.**—860 Los Angeles St., Los Angeles, Cal.
Spear Martin Fur Co.—41 Church St., Burlington, Vt.
Syracuse & Eldridge Gloves Co.—924 S. Salina St., Syracuse, N. Y.

WEARING APPAREL—MISCELLANEOUS

- American Buffalo Robe Co.**—Buffalo, N. Y.
Auto Garment Co.—208 B Ave., Cedar Rapids, Ia.
Bishop & Co., The J. H.—Wyandotte, Mich.
Boyntons Improved Pioneer Oil Clothing Co.—Vincent St., Gloucester, Mass.
Brann, E.—1225 Park Ave., New York City.
Brooks Bros.—22nd St. and Broadway, New York City.
Chicago Auto Robe Supply Co.—159 Market St., Chicago, Ill.
Clark Glove Co., The.—Peabody, Mass.
Crosby Frisian Fur Co.—116 Mill St., Rochester, N. Y.
Davis Robe Co., Inc.—1307 Champlain Bldg., Chicago, Ill.
Dougherty & Colt Mfg. Co.—105 W. Bridge St., Columbus, O.
Ellsworth & Thayer Mfg. Co.—Milwaukee, Wis.
Enterprise Rubber Co.—110 Federal St., Boston, Mass.
Fuller & Sullivan.—19 Elliot St., Boston, Mass.
Gilbert Mfg. Co.—New Haven, Conn.
Gunther's Sons, G. C.—184 5th Ave., New York City.
Hugh Wallace Co.—Boulevard and Orleans St., Detroit, Mich.
Lilley & Co., M. C.—Columbus, O.
Macullar-Parker Co.—Boston, Mass.
Manhattan Storage Co.—1611 Broadway, New York City.
Milford Auto Coat Co.—Milford, Mass.
Morawetz Co.—Milwaukee, Wis.
Moore Smith Co.—Boston, Mass.
New York Leather Coat Co.—207 Greene St., New York City.
Our Own Mfg. Co.—568-74 Broadway, New York City.
Olson Mills.—1120 Beaufait, Mich.
Olson, Inc.—19 W. 34th St., New York City.
Olson & Co.—258-842-1260 Broadway, New York City.
Olson Co., John.—73-77 Mercer St., New York City.
Olson Fur & Leather Co.—16 W. 34th St., New York City.
Olson Co., The.—71 Gallia St., New York City.

WEARING APPAREL—MISCELLANEOUS (Continued)

- Seaboard Rubber Co.**—278 Pearl St., New York City.
Shuman & Co., A.—Boston, Mass.
Smith, Crary & Davidge.—174 Water St., Binghamton, N. Y.
Sprague Co., F. H.—Orange, Mass.
Stall & Dean Mfg. Co.—Brockton, Mass.
Toplitz, George.—878 Broadway, New York City.
Upthegrove Sporting Goods Co.—Valparaiso, Ind.
Wiley & Son Co., Wm. H.—Box 30, Hartford, Conn.
Willis Co., E. J.—8 Park Place, New York City.

WEARING APPAREL—MUFFLERS

- Scott Muffler Co., The.**—71 Gallia St., Portsmouth, O.
Visor Knitting Co.—2016 Whirlpool Ave., Niagara Falls, N. Y.
Way Muffler Co., The.—23rd St. and Arch St., Philadelphia, Pa.

WELDING—ELECTRIC

- Midgley Mfg. Co.**—Columbus, O.
Standard Welding Co.—Cleveland, O.

WHEELS—ELASTIC

- Amelot.**—Parthenay, Deux-Sèvres, France.
Beucher, L.—rue St. Pierre, St. Calais, Sarthe, France.
Borchers, Dr.—Waldstrasse 43, Berlin, Germany.
Bourdier-Villeve.—100 rue Bannier, Orleans, France.
Crépet, V.—la Demi-Lune, Rhone, France.
Établissements, Peltier et Thuault.—7 ave de Robinson, Sceaux-Robinson, Seine, France.
Fréteillière.—49 rue de Lorraine, Levallois, Seine, France.
Gras, Alex.—13 bvd. de Versailles, Suresnes, France.
Jackson Resilient Hub Syndicate.—32 Victoria St., Westminster, London, England.
Monning, G.—Warschauerstrasse 5, Berlin, Germany.
Roue Élastique, L. G.—53 bis, rue de Chateaudun, Paris, France.
Roue Soleil, La.—3 square Moncey, Paris, France.
Société Anonyme des Établissements Coudert Mignot.—Puy-de-Dôme, France.
Société Anonyme de la Roue à Jante Flexible Lambert.—3 place Daumesnil, Paris, France.
Société Française de la Roue E. L.—26 rue de Sablonville, Neuilly-sur-Seine, France.

WHEELS—ELASTIC (Continued)
Société des Roues a Jante Creuse et Flexible L. F.—50 bvd. de la Villette, Paris, France.
Stratta, F.—Villa Stratta Castiglione, Turin, Italy.
Supery, H.—13 rue Cuvier, Lyons, France.

WHEELS—EMERY

Adamite Abrasive Co.—Schenck St., Tonawanda, N. Y.
Buffalo Emery Wheel Co.—127 Ash St., Buffalo, N. Y.
Carborundum Co., The.—Buffalo and 18th Sts., Niagara Falls, N. Y.
National Corundum Wheel Co.—455 Ellicott St., Buffalo, N. Y.
Norton Emery Wheel Co.—Buffalo Ave., Niagara Falls, N. Y.
Norton Emery Wheel Co.—Worcester, Mass.

WHEELS—SPARE

Spare Wheel Co. of America, Ltd., The.—Sales Dept., 234-56 Michigan Ave., Chicago, Ill. N. Y. Sales Office, 2148 Broadway.
Stepney Spare Motor Wheel, Ltd.—Llanelly, South Wales.

WHEELS—STEERING

American Wood Rim Co.—Bradford, Pa.
Bryant & Berry Co.—34 W. Atwater St., Detroit, Mich.
Cambria Forge Co.—Cleveland, O., and Johnstown, Pa.
Centaur Motor Co.—59 Franklin St., Buffalo, N. Y.
Diamond Tire Co.—Akron, O.
Garford Co., The.—Elyria, O.
Goeras, Herman.—162 Russel Ave., Cleveland, O.
Jamesville Mfg. Co.—Jamesville, N. Y.
Coleman, J. C.—234 Jefferson Ave., Detroit, Mich.
McCutchen Gear & Mfg. Co.—205 W. South St., Indianapolis, Ind.
Meyer, Morris F.—65-67-69 E. Woodbridge St., Detroit, Mich.
Muncie Auto Parts Co.—Elliott St., L. E. W. Yards, Muncie, Ind.
Rastetter & Son, Louis.—Fort Wayne, Ind.
Smith Co., A. O.—Park and Clinton Sts., Milwaukee, Wis.
Towne Patent Steering Wheel Co.—214 L. A. Trust Bldg., Los Angeles, Cal.
Tucker Wood Work Co.—Sidney, O.

WHEELS—TUBULAR AND SHEET STEEL

Albany Mfg. Co., Ltd.—Cumberland Park, Willesden Junction, London, England.

WHEELS—TUBULAR AND SHEET STEEL (Continued)

Birmingham Small Arms Co., Ltd.—Birmingham, England.
Boulanger, J.—Revigney, Meuse, France.
Bryant Steel Wheel & Rim Co.—454 Hayden Bank Bldg., Columbus, O.
Commergnat, A.—Auxerre, Yonne, France.
Forges de Douai.—52 bvd. Haussmann, Paris, France.
Fouch Disc Wheel Co., Inc.—Tribune Bldg., Minneapolis, Minn.
Indestructible Steel Wheel Co.—Lebanon Ind. Offices, 1303 Michigan Ave., Chicago, Ill.
Midgley Mfg. Co.—Columbus, O.
Rudge-Whitworth, Ltd.—Coventry, England.
Smith Co., A. O.—Park and Clinton Sts., Milwaukee, Wis.
Stier, L.—144 rue de Paris, Villiers-sur-Marne, Seine-et-Oise, France.
Whiteside Wheel Co.—W. 10th and Canal Sts., Indianapolis, Ind.

WHEELS—WIRE

Garford Co., The.—Elyria, O.
Jamesville Mfg. Co.—Jamesville, N. Y.
Mott Wheel Works.—Pleasant St., Utica, N. Y.
Prudden & Co., W. K.—Lansing, Mich.
Rastetter & Son, Louis.—Fort Wayne, Ind.

WHEELS—WOOD

Archibald Wheel Co.—Lawrence, Mass.
Bols, Petrus.—rue Haute. Malines, Belgium.
Borbein Auto Co.—2109-11 9th St., St. Louis, Mo.
Buineau, Georges.—24 rue Parmentier, Courbevoise, Seine, France.
Carr Prescott Co.—Amesbury, Mass.
Ceulemans, J.—8 rue d'Espague, St. Gilles, Brussels, Belgium.
Chicot, S.—78 rue des Arts, Levallois, Seine, France.
City Machine Co.—9-13 Orchard St., Detroit, Mich.
Courty, A.—30 rue du Pont, Neuilly-sur-Seine, France.
Dubarry V.—25 rue Soyer, Neuilly-sur-Seine, France.
Eames & Co., A. M.—South Framingham, Mass.
Glassner, Martin.—Ratibor, sien, Germany.
Guth und Wolff.—Liegnitz.
Hagerstown Spoke
 Hagerstown, Ind.
Hanote-Dartois, Ve
 Valenciennes, Douai, France
Houdet, Ernest.—7 bis, rue de Neuilly-sur-Seine, France.
Hooper Bros. & Darlington.
 Chester, Pa.

WHEELS—WOOD (Continued)

Hora, Ltd., E. & H.—36 Peckham Road, London S. E., England.
Imperial Wheel Co.—Flint, Mich.
Jamesville Mfg. Co.—Jamesville, N. Y.
Jones, John E.—173 South St., Utica, N. Y.
Jones, Phineas & Co.—30 Market St., Newark, N. J.
Küstermann, Gebrüder.—Usedomstrasse 21, Berlin N., Germany.
Lemoine.—21 rue de Lappe, Paris, France.
Luverne Automobile Co.—L u v e r n e, France.
National Wheel Co.—Jackson, Mich.
Neustadt Auto & Supply Co.—3948-50 Olive St., St. Louis, Mo.
Neveu et Cie, J.—169 ave due Roule, Neuilly-sur-Seine, France.
New Haven Carriage Co.—New Haven, Conn.
Pauliac, F. fils.—usine de Pont-St. Jean, Bergerac, Dordogne, France.
Pelgrims, Forges et Ateliers de Construction R.—145 rue Neuve, Brussels, Belgium.
Prudden & Co., W. K.—Lansing, Mich.
Pullwin Wheel Co., The.—37 Colony St., Meriden, Conn.
Robert, M.—15 rue de Sclessin, Liège, Belgium.
Rockford Automobile & Engine Co.—Rockford, Ill.
Salisbury Wheel & Mfg. Co.—Jamestown, N. Y.
Schwarz Wheel Co.—Glenwood Ave. above 20th St., Philadelphia, Pa.
Sendelbach Wheel Co.—E. St. Louis, Ill.
Smith, Parfrey & Co., Ltd.—Rannoch St., Fulham Palace Road, Hammersmith, London, England.
Stier, L.—144 rue de Paris, Villiers-sur-Marne, Seine-et-Oise, France.
Tangent Wheels, Ltd.—Grove Road, Balham, London S. W., England.
Veziel, Fouanon et Cie.—45 rue Jean-Macé, Suresnes, France.
Wales & Son.—York, England.
Wapakoneta Wheel Co.—Wapakoneta, Ohio.
Weston-Mott Co.—Flint, Mich.
Wheel & Wood Bending Co., The.—141 John St., Bridgeport, Conn.
Zornow.—Altona, Germany.

WHISTLES

u'Innovation pour Automobiles.—16 avenue de la Grand Aimée, Paris, France. New York office, 1693 Broadway.
nd & Jones.—315 Riopelle St., Detroit, Mich.
Hawley Mfg. Co.—605-609 W. Fort, Detroit, Mich.

WIRE—INSULATED

American Electrical Works.—Providence, R. I.
American Steel & Wire Co.—The Rookery, Chicago, Ill.
Atlantic Insulated Wire & Cable Co.—120 Liberty St., New York City.
Bishop Gutta-Percha Co.—425 E. 25th St., New York City.
Bourn Rubber Co.—Providence, R. I.
Chicago Insulated Wire & Mfg. Co.—152-154 Lake St., Chicago, Ill.
Clark Insulation Co., The.—186 Freeport St., Boston, Mass.
Eastern Electric Cable Co.—61-63 Hampshire St., Boston, Mass.
Geen Electrical Mfg. Co., Inc.—180 Lake St., Chicago, Ill.
Hazard Mfg. Co.—Wilkesbarre, Pa.
India Rubber & Gutta Percha Insulating Co.—253 Broadway, New York City.
Indiana Rubber & Insulated Wire Co.—Jonesboro, Ind.
Okonite Co.—253 Broadway, New York City.
National India Rubber Co.—Bristol, R. I.
New York Insulated Wire Co.—114 Liberty St., New York City.
Packard Electric Co.—399 North Ave., Warren, O.
Pneumatic l'Electric Co.—1591 Broadway, New York City.
Remy Electric Co.—Anderson, Ind.
Rubay, Leon.—1697 Broadway, New York City.
Safety Insulated Wire & Cable Co.—114 Liberty St., New York City. Factory, Bayonne, N. J.
Simplex Electrical Co.—110 State St., Boston, Mass.
Standard Underground Cable Co.—Pittsburg, Pa.
Witherbee Igniter Co.—541 W. 43rd St., New York City.

WIRE—PLATINUM

American Platinum Works.—251 N. J. R. Ave., Newark, N. J.
Baker & Co., Inc.—408-414 N. J. R. R. Ave., Newark, N. J.
Croselmire & Ackor Co.—42 Walnut St., Newark, N. J.
Goldsmith Bros. Smelting & Refining Works.—63-65 Washington St., Chicago, Ill.

WIRE—SPRING STEEL

Cary Spring Works.—240-42 W. 29th St., New York City.
Ward & Sons, Edgar T.—23-25 Purchase St., Boston, Mass.

WOOD—BENT

Dann Bros. & Co., The.—84 Franklin St., New Haven, Conn.
Shepard & Sons.—New Haven, Conn.

WOOD—BENT (Continued)

Tucker Wood Work Co., The.—Sidney, Ohio.
Wheel & Wood Bending Co., The.—141 John St., Bridgeport, Conn.

WOOL—STEEL

American Steel Wool Co.—451-53 Greenwich St., New York City.
Buehne Steel Wool Co., The.—93 Nassau St., New York City.
Garford Co., The.—Elyria, O.

WRENCHES

Ball Tool Co.—253 A St., Boston, Mass.
Bullard Automatic Wrench Co.—Providence, R. I.
Coes Wrench Co.—Worcester, Mass.
Davidson & Co., J. S.—Jamestown, N. Y.
Detroit Wrench Co.—Tolsma Bldg., 45 State St., Detroit, Mich.
Dudley Mfg. Co., A.—Menominee, Mich.
Granger's Drop Forge Works.—Chicago, Ill.
Hammond Wrench Co.—26-30 Atlantic Ave., Boston, Mass.
Hall, Chas. E.—108 Broadway, New York City.
Hawkeye Wrench Co.—Marshalltown, Ia.
Hjorth Wrench Co.—Jamestown, N. Y.
Hobson Wrench Co.—Indianapolis, Ind.
Indianapolis Drop Forging Co.—Indianapolis, Ind.
Janney, Steinmetz & Co.—Fourth and Market Sts., Philadelphia, Pa.
Long Wrench Co., The J. R.—Akron, O.
Lamson & Sessions Co.—412-53 Scranton Ave., Cleveland, O.

WRENCHES (Continued)

Leng's Son & Co., John S.—33 Murray St., New York City.
Mason Wrench & Tool Co.—First National Bank Bldg., Chicago, Ill.
Moore Drop Forging Co.—Springfield, Mass.
Mossberg Co., Frank.—S. Main and Mill Sts., Attleboro, Mass.
Offset Handle Wrench Co.—123 LaSalle St., Chicago, Ill.
Patterson, Gottfried & Hunter, Ltd.—146-150 Centre St., New York City.
Pedersen Mfg. Co.—400-412 E. 37th St., New York City.
Quincy Manchester Sargent Co.—84 Van Buren St., Chicago, Ill.
Rothenbucher, Geo. E. R.—102 Hinsdale St., Brooklyn, N. Y.
Smith & Hemmingway.—296 Broadway, New York City.
Syracuse Wrench Co.—Franklin and Water Sts., Syracuse, N. Y.
Tower & Lyon Co.—95 Chambers St., New York City.
Trimont Mfg. Co.—Roxbury, Mass.
Wakefield, J. E.—89 Exchange St., Worcester, Mass.
Walden Mfg. Co.—65 Beacon St., Worcester, Mass.
Walworth Mfg. Co.—128-136 Federal St., Boston, Mass.
Warren Axle & Tool Co.—Warren, Pa.
Whitman & Barnes Mfg. Co.—Akron, O.
Williams & Co., J. H.—150 Hamilton Ave., Brooklyn, N. Y.
York Electric & Machine Co.—30-34 N. Penn St., York, Pa.

Classified Trade Directory Arranged Geographically

UNITED STATES

ALABAMA

ANDALUSIA—

Automobile Agents and Dealers.
Doty, Ed. (Waltham.)

ANNISTON—

Automobile Agents and Dealers.
Anniston Hardware Co.—1118 Noble St. (Buick.)

BIRMINGHAM—

Automobile Agents and Dealers.
Automobile Exchange.—Cor. Ave. D and 20th St. (Ford, Pope-Waverley, National Baker.)
Barbour Plum & Electric Co., Ben. F.—2119 3rd Ave. (Mitchell.)
Birmingham Garage.—121 South 20th St. (Maxwell.)
Harrison Auto Co., W. T.—1804 4th Ave. (Cadillac.)
Katz & Co., Frank. (Haynes.)
Van Duzen Kehm Motor Car Co. (Rambler, Reo.)

Garages.

White-Blakeslee Mfg. Co.

GADSDEN—

Automobile Agents and Dealers.
Fultcher, Joe. T. (Cadillac.)

HUNTSVILLE—

Automobile Agents and Dealers.
Huntsville Motor Car Co.—Holmes St. (Ford.)

MOBILE—

Automobile Agents and Dealers.
Block Bros.—9 Water St. (Rambler.)
Flock & McBee. (Buick.)
Gould Motor Car Co.—53 South Royal St. (Cadillac.)
Gunthorpe, McKean Co. (Maxwell.)
Hartwell, Guy J. (Glide.)
Mobile Auto Co. (Stoddard-Dayton.)
South Automobile Co.—105 S. Conception St. (Pierce-Arrow.)
Southern Automobile Co. (Wayne.)

Garages.

Mobile Motor Car Co.

MONTGOMERY—

Automobile Agents and Dealers.
Capital City Garage.—Perry St. (Buick, Waltham.)
Kennedy Paint Co., A. M. (Reo.)
Le Bron, A. W. (Maxwell.)
Montgomery Auto Co. (Cadillac.)
Mosley Haiger Electric Co.—308-310 Lee St, Garage. (Stoddard-Dayton.)

Garages.

Ivery Realty Co.

ALABAMA (Continued)

Mosley-Haiger Electric Co.—308-310 Lee St. (Stoddard-Dayton.)

Rental Service.

Montgomery Auto Transfer.—207 Mon-red St.

SELMA—

Automobile Agents and Dealers.

Selma Gun & Key Co.—917 Water St. (Wayne, Pope-Hartford, Waltham, Mitchell.) Garage and repairing.

Garages.

Selma Gun & Key Co.—917 Water St. (Wayne, Pope-Hartford, Waltham, Mitchell.) Repairing.

Repairing, Automobile.

Selma Gun & Key Co.—917 Water St. (Wayne, Pope-Hartford, Waltham, Mitchell.) Garage.

ARIZONA

BISBEE—

Automobile Agents and Dealers.

Brown, J. L. (Reo.)
Moore Fuel & Feed Co. (Maxwell.)
Sims, W. P. (Waltham.)

DOUGLAS—

Automobile Agents and Dealers.

Elvey, Frank O. (Cadillac.)
Steger, H. B.—1014 9th St. (Ford, Waltham.)

PHOENIX—

Automobile Agents and Dealers.

Phoenix Light & Fuel Co. (Cadillac.)
Ryan, Garret T. (National.)
Southwestern Automobile Co.—West Adams St. (Rambler.)

Garages.

Arizona Auto Co.

TOMBSTONE—

Automobile Agents and Dealers.

Hoar Auto Co. (Queen.)

TUCSON—

Automobile Agents and Dealers.

Huntsman Auto Co. (Mitchell.)
Pioneer Auto Co. (Buick.)

Garages.

Wells Auto Co., G. A.

ARKANSAS

CROSSETT—

Automobile Agents and Dealers.

Crossett Mercantile Co. (Northern.)

FORT SMITH—

Automobile Agents and Dealers.

Finks, H. P. (Holsman.)

ARKANSAS (Continued)

HOT SPRINGS—

Automobile Agents and Dealers.
Ellsworth, F. V. P. (Waltham.)
Hot Springs Auto Co. (Reo.)

JONESBORO—

Parts and Accessories Manufacturers.
American Karbel Co. Automobile covers.

LITTLE ROCK—

Automobile Agents and Dealers.
Arkansas Auto. Co. (Cadillac Oldsmobile.)
Little Rock Auto Co.—311 West 3rd St. (Dolson.)
Pullman, C. R. (Logan.)

PINE BLUFF—

Automobile Agents and Dealers.
Hankenson & Thompson. (Cadillac.)
Speers, M. A. (Thomas Flyer.)

CALIFORNIA

ALAMEDA—

Clubs and Associations.
Alameda Island Auto Club.
Automobile Agents and Dealers.
Merchant, B. D.—2150 Central Ave. (Pope-Hartford, Franklin, Royal, Hewitt.) Repairing, garage.

Garages.

Merchant, B. D.—2150 Central Ave. (Pope-Hartford, Franklin, Royal, Hewitt.) Repairing.

Repairing, Automobile.

Merchant, B. D.—2150 Central Ave. (Pope-Hartford, Royal, Franklin, Hewitt.) Garage.

ANAHEIM—

Automobile Agents and Dealers.
Skinner, O. M. (Reo.)
Weisel, P. J. (Moline, Ford, Maxwell.)
Garages.
Beebe, B. V.
Howard, J. S.
Orange County Garage.—West Center St.

BAKERSFIELD—

Automobile Agents and Dealers.
Bakersfield Garage.—19th and G Sts. (Tourist.)
La Porte, V. E.—1729 19th St. (Jewel.)
Sharps Garage. (Maxwell.)
Stephenson, W. W.—Box 24. (Rambler, Maxwell.)

BERKELEY—

Automobile Agents and Dealers.
Berkeley Automobile Co. (American.)
Chesebrough, L. F.—2337 Telegraph Ave. (Cameron.)
Pitman & Nelson Auto Co.—2036 Addison St. (Page-Adrian.) Garage and repairing.
San Francisco Motor Co. (Dolson.)
Garages.
Pitman & Nelson Auto Co.—2036 Addison St. (Page-Adrian.) Repairing.

CALIFORNIA (Continued)

Repairing, Automobile.

Pitman & Nelson Auto Co.—2036 Addison St. (Page-Adrian.) Garage.

CHICO—

Automobile Agents and Dealers.
Park Garage.—425 Main St. (Ford, Rambler.)

Garages.

Phoenix Garage.—526-528 Main St.

COLUSA—

Garages.

Wulf's Garage.

COMPTON—

Automobile Agents and Dealers.
Johnson, E. C. (Maxwell.)

CONCORD—

Automobile Agents and Dealers.
Mt. Diablo Garage. (Rambler.) Garage and repairing.

Garages.

Mt. Diablo Garage. (Rambler.) Repairing.

Repairing, Automobile.

Mt. Diablo Garage. (Rambler.) Garage.

CORONA (Riverside County)—

Automobile Agents and Dealers.
Auto Machine Works.—103 East 6th St. (Rambler.)

CORONADO—

Garages.

White Garage, The.

COVINA—

Automobile Agents and Dealers.
Griswold, T. F. (Maxwell.)

CORNWALL—

Garages.

Wight, W. W.

EUREKA—

Automobile Agents and Dealers.
Pioneer Garage.—420 4th St. (Ford, Mitchell.)

Garages.

Smythe, F. W.—7th and H Sts.

FRESNO—

Automobile Agents and Dealers.
Anthony, R. S. (Jewel.)
Pelton Grissel Auto Co. (Maxwell.)
Rialto Automobile Co. (Winton.)
Waterman Bros. Co., Inc.—1222 1st St. (Cadillac, White.)

Motorcycle Agents and Dealers.

Donahoo-Emmons & Co.—1114 1st St. (Indian.)

FULLERTON—

Automobile Agents and Dealers.
Sitton, Albert. (Tourist.)

GLEN ELLEN—

Automobile Agents and Dealers.
Van Meter, H. (Waltham.)

HANFORD—

Automobile Agents and Dealers.
Cousins & Howland. (Mitchell.)
Gurner, B. S.—410 West 7th St. (Ford, Buick, Auburn, Reo.) Garage and repairing.

CALIFORNIA (Continued)

Hanford Agricultural Works. (Oldsmobile, Winton.)
Morton, R. E. L. (Maxwell.)
Patnot, A. F. (Pope.)

Garages.

Gurner, B. S.—410 West 7th St. (Ford, Buick, Auburn, Reo.) Repairing.

Repairing, Automobile.

Gurner, B. S.—410 West 7th St. (Ford, Buick, Auburn, Reo.) Garage.

LEGRAND—

Automobile Agents and Dealers.

Cunningham, J. C. (White.)

LINCOLN—

Automobile Agents and Dealers.

Western Motor Car Co. (Maxwell, Rambler.)

LODI—

Automobile Agents and Dealers.

Culbertson Bros. — Sacramento St. (Waltham.)

LOMPOC—

Automobile Agents and Dealers.

Harris & Dunlap. (Reo.)

LONG BEACH—

Automobile Agents and Dealers.

Craig, F. S. (Dolson.)

Fourth St. Auto Co.—323 East 4th St. (Maxwell.)

Johnson-Shields Auto Co. (Oldsmobile.)

Long Beach Auto Co.—142 Pacific St. (Pope-Waverley, Tourist, Maxwell, Columbus Electric.) Garage and repairing.

Pioneer Auto Co. (Rambler.)

Garages.

Cook Electric Garage.—144 Pacific Ave.

Long Beach Auto Co.—142 Pacific St. (Pope-Waverley, Tourist, Maxwell, Columbus Electric.) Repairing.

Repairing.

Long Beach Auto Co.—142 Pacific St. (Pope-Waverley, Tourist, Maxwell, Columbus Electric.) Garage.

LOS ANGELES—

Clubs and Associations.

Automobile Club of Southern California.—Chas. B. Hopper, Sec.; 402 Laughlin Bldg.

Los Angeles Automobile Club.

Automobile Agents and Dealers.

Anthony, Chas. S.—112 East 9th St. (Federal.)

Auto Vehicle Co.—10th and Main Sts. (Atlas trucks, Tourist.)

Bennett, E., Jr.—1203 South Main St. (Crawford, Wayne.)

Bentel, Geo. R.—604 Laughlin Bldg. (American Mercedes.)

Big 4 Auto Co.—110 East 9th St. (Marmon, Monarch, Model.)

Bill, John T.—10th and Main Sts. (Stoddard-Dayton.) Supplies.

CALIFORNIA (Continued)

Billington Motor Car Co.—605-7-9 West 7th St. (Knox trucks, Knox automobiles.) Garage and repairing.

Braley, A. H.—400 South Spring St. (Stearns.)

Brown, B. L.—1126 South Main St. (Pope-Waverly.)

Bush, Wm. E.—953 South Main St. (Pierce Arrow, Napier.)

Cameron Motor Car Co.—923 South Main St. (Cameron.)

Capito Carriage Co.—1201 S. Main St. (Aerocar.)

Columbus Buggy Co.—10th and Main Sts. (Columbus Electric.)

Copelin, J. E.—223 West 8th St. (Holsman.)

Cosby, W.—2602 South Main St. (Premier.)

Cowan, W. K.—834 Broadway. (Rambler.) Garage and repairing.

Diamond Motor Car Co.—1160 South Main St. (Apperson, Northern, Waltham.)

Dragon Motor Car Co.—130 East 9th St. (Dragon.)

Dudley, J. Bliss. (Crawford.)

Duro Manufacturing Co.—935 South Los Angeles St. (Durocar.)

Electrical Construction Co. — 1126 South Main St. (Baker, Columbus, Dolson, Mora, Pope-Waverly.)

Elmore Motor Car Co.—1228 S. Figueroa St. (Elmore.)

Fitch Auto Co.—410 S. Main St. (Simplicity.)

Gale Garage.—1915 S. Hoover St. (Gale.)

Gilley, H. E.—1158 S. Main St. (Auburn, Sunset.)

Greer-Robbins Co.—1501 S. Main St. (Mitchel.) Garage.

Gregory, Wm.—600 N. Main St. (Moline.)

Gump Automobile Co., A. W.—1118 S. Main St. (Jackson, Glide.)

Hamlin, R. C.—1806 S. Main St. (Franklin, Lozier.)

Harrison Co., H. O.—1210 S. Main St. (Peerless, Oldsmobile, Corbin.)

Holst Bros.—139 E. 9th St. (Autocar.)

Jewel Auto Co.—117 W. 16th St. (Jewel.)

Lambert Agency, Pacific Garage.—1225-7 W. Washington St. (Lambert.)

Lee Motor Car Co.—1218 S. Main St. (Cadillac.)

Lord Motor Car Co.—1044 S. Main St. (Cleveland, Kissel Kar, Mason, Woods.)

McNaughton, J. F.—1126 S. Main St. (Dolson, Mora.)

Maxwell-Briscoe-Wilcox Co.—1211 S. Main St. (Maxwell.)

CALIFORNIA (Continued)

Middleton Motor Car Co.—1032 S. Main St. (Autocar, Columbia.)
 Mitchell Agency.—380 S. Los Angeles St. (Marvel.)
 Morley, Jas. F.—220½ S. Spring St. (Royal, Coppock.)
 National Motor Car Co.—957 S. Main St. (National, Triumph.)
 Occident Motor Car Co.—2731 W. Pico St. (Cartercar.)
 Pacific Automobile Co.—1030 S. Main St. (De Luxe, Queen, Overland.)
 Pendleton, W. H. E.—7th and Grand Ave. (Austin.)
 Pullman Motor Car Co.—1140 S. Main St. (Pullman Flyer.)
 Ramsey-Hutchins Co.—1048 S. Main St. (Pierce-Racine.)
 Renton & Williams Motor Car Co.—1032 S. Main St. (Atlas, Smith.)
 Shettler, L. T.—633 S. Grand Ave. (Reo.)
 Smith, A. J.—Genl. Sales Agt., 1228 S. Figueroa St. (Elmore.)
 Smith Bros. (Rainier.)
 Southern California Motor Car Co.—1811 S. Main St. (American, Mar-ion.)
 Standard Motor Car Co.—118 E. 9th St. (Ford, Acme, Soules.)
 Stewart Co., A. C.—10th and Santee Sts. (Dorris.)
 Stoddard Dayton Motor Car Co.—10th and Main Sts. (Stoddard-Dayton.)
 Stone, H. J. (Fraye-Miller.)
 Success Automobile Co.—Hill and Pico Sts. (Locomobile, Winton, Isotta-Fraschini, Mercedes, Panhard, Renault, Simplex.)
 Superior Auto Co.—130 E. 9th St. (Haynes.)
 Thayer, F. E.—1028 S. Main St. (Darracq.)
 Western Motor Car Co.—418 S. Hill St. (Packard, Thomas, Stevens-Duryea, Buick, Knox commercial.) Garage and repairing.
 White Garage.—712 S. Broadway. (White, Pope-Hartford, Pope-Toledo.)

Automobile Manufacturers, Gasolene.

Auto Vehicle Co.
 Durocar Mfg. Co.—1130 S. Main St.
Garages.
 Angelus Motor Car Co.—110 E. 3rd St.
 Billington Motor Car Co.—605-7-9 W. 7th St. (Knox trucks, Knox automobiles.) Repairing.
 Cowan, W. K.—830-834 Broadway. (Rambler.) Repairing.
 Greer-Robbins Co.—1501 S. Main St. (Mitchell.)
 National Garage.—Cor. 7th and Main Sts.
 Thorpe, R. E.

CALIFORNIA (Continued)

Western Motor Car Co.—418 S. Hill St. (Packard, Thomas, Stevens-Duryea, Buick, Knox commercial.) Repairing.
 Westlake Garage Co.—660 S. Alvarado St.
Motorcycle Agents and Dealers.
 Bullock, J. G. (Merkel.)
 Jones, E. M. (Motor Racycle.)
 Risden, C. W.—223 W. 8th St. (Indian.)
Parts and Accessories Manufacturers.
 Ajax-Greib Rubber Co.—1046 S. Main St. Tires.
 Diamond Rubber Co.—1207-9 Main St. Tires.
 Fisk Rubber Co.—1034 S. Main St. Tires.
 Goodrich Co., B. F.—818 S. Broadway. Tires.
 Goodyear Tire & Rubber Co.—932 S. Main St. Tires.
 Hercules Auto Specialty Mfg. Co.—936 Denver Ave. Shock absorbers.
 Morgan & Wright.—118-122 E. 10th St. Tires.
 Pacific Continental Tire Agency.—1018 S. Main St. Tires.
 Southern California Glove Co., Inc.—860 S. Los Angeles St. Wearing apparel. (Gloves and gauntlets.)
 Towne Patent Steering Wheel Co.—214 L. A. Trust Bldg. Steering wheels.
Repairing, Automobile.
 Billington Motor Car Co.—605-7-9 W. 7th St. (Knox trucks, Knox automobiles.) Garage.
 Cowan, W. K.—830-834 Broadway. (Rambler.) Garage.
 Tabor, J. U.—201 E. 7th St. Repairing.
 Western Motor Car Co.—418 S. Hill St. (Packard, Thomas, Stevens-Duryea, Buick, Knox commercial.) Garage.
Supply Houses.
 Bill, John T.—10th and Main Sts. (Stoddard-Dayton.)
 Heineman-Pearson.—1018 S. Main St.
 Hughson & Merton.—1040 S. Main St.
 Moore, Geo. P. Co., Inc.—1005 S. Main St.

LOYALTON—

Automobile Agents and Dealers.
 Ball, J. V. (Waltham.)

MARYSVILLE—

Automobile Agents and Dealers.
 Grow Auto Garage & Machine Shop.—300 F St. (Oldsmobile, Winton.)
Garages.
 Armstrong & Sons.

MERCED—

Automobile Agents and Dealers.
 Hohensheel, W. T. (Moline.)

CALIFORNIA (Continued)

NAPA—

Automobile Agents and Dealers.

Hecter, C. B.—103 Main St. (Rambler, Napier, Waltham.)

Jacks, E. D. (Thomas, Winton, Oldsmobile, Royal, Buick.)

OAKLAND—

Clubs and Associations.

Alameda County Automobile Club.—F. F. Weston, Sec. 1392 Webster St.

Automobile Agents and Dealers.

Bain, Walter & Manley, L. (Glide.)

California Auto Co.—1224 Webster St. (Maxwell, Mitchell.)

Central Garage.—12th and Madison Ave. (Cadillac.)

Clayton, Geo. L. (Dorris.)

Interurban Motor Car Co.—1920 Broadway. (American, Knox.)

Keystone Motor Car Co.—421 11th St. (Acme, Blomstrom.)

Leavitt & Co. (Reo, Cleveland.)

Morris, R. H.—1818-20 Telegraph Ave. (Pope-Waverley.)

Mortland Automobile Co.—12th and Oak Sts. (Glide.)

National Motor Car Co. (Chadwick, Jackson, National, Queen.)

Pacific Motor Car Co.—1416 Broadway. (Stevens-Duryea.)

Pioneer Automobile Co.—12th and Madison Sts. (Winton, Thomas, Oldsmobile.) Garage and repairing.

Rarig Auto & Garage Co.—466 20th St. (Queen, National, Jackson.)

Renstrom Co., Frank, O. (Pullman.)

Standard Motor Car Co.—421 11th St. (Babcock, Acme.)

Garages.

Bennett's Auto Garage.

McCord, Don C.

Myers, S. C.—513 16th St.

Oakland Auto Garage.—12th St. and 8th Ave.

Phoenix Auto Exchange.—7495 San Pablo Ave.

Pioneer Automobile Co.—12th and Madison Sts. (Winton, Thomas, Oldsmobile.) Repairing.

Poole, W. J.—370 12th St.

Parts and Accessories Manufacturers.

Burnham-Standeford Co.—Portable houses.

Consolidated Rubber Tire Co.—366 12th St. Tires.

Diamond Rubber Co.—108-12 Telegraph Ave. Tires.

Goodrich Co., B. F.—4th and Washington Sts. Tires.

Repairing, Automobile.

Pioneer Automobile Co.—12th and Madison Sts. (Winton, Thomas, Oldsmobile.) Garage.

CALIFORNIA (Continued)

Supply Houses.

Moore, Geo. P. Co., Inc.—231 12th St.

ORANGE—

Automobile Agents and Dealers.

Williams & Son, J. C. (Reo.)

OROVILLE—

Automobile Agents and Dealers.

Hart, J. H. (Rambler, Reo.)

OXNARD—

Garages.

Oxnard Garage & Machine Co.—5th St.

PACIFIC GROVE—

Garages.

Culp Bros.—307 Forest Ave. Repairing.

Repairing, Automobile.

Culp Bros.—307 Forest Ave. Garage.

PALO ALTO—

Automobile Agents and Dealers.

Columbia Cyclery.—114 Circle. (Winton.)

Corbaley & Thorpe Auto Co.—443-449 Emerson St. (Autocar, Columbia, Sunset, Maxwell.) Garage and repairing.

Sloan, E. J. (Iroquois.)

Stanford Garage.—112 Alma St. (Ford.)

Garages.

Corbaley & Thorpe Auto Co.—443-449 Emerson St. (Autocar, Columbia, Sunset, Maxwell.) Repairing.

Repairing, Automobile.

Corbaley & Thorpe Auto Co.—443-449 Emerson St. (Autocar, Columbia, Sunset, Maxwell.) Garage.

PASADENA—

Clubs and Associations.

Pasadena Automobile Club.

Automobile Agents and Dealers.

Braley, E. B. R. (Maxwell, Pope-Waverly.)

Fair Oak Garage. (Rambler.)

Fischbeck, Fred. (Deere.)

Union Garage. (Ford.)

Garages.

Pasadena Automobile Co.—57 W. Union St.

POMONA—

Automobile Agents and Dealers.

Auto Garage. (Rambler.)

Miller, Geo. H.—275 S. Garey Ave. (Ford, Tourist, Pope-Waverley.)

Pomona Garage. (Reo.)

Thomas, F. C. (Maxwell.)

Garages.

Lewis, Fred R.

REDLANDS—

Automobile Agents and Dealers.

Carter, C. C.—5th St. (Cadillac.)

Osborn Iron Works.—113-119 W. Central Ave. (Tourist.) Garage and repairing.

Richardson, Lee. (Earl.)

CALIFORNIA (Continued)

Garages.

Casa Loma Garage.

Osbn Iron Works.—113-119 W. Central Ave. (Tourist.) Repairing.

Redlands Auto Co.

Repairing, Automobiles.

Osbn Iron Works.—113-119 W. Central Ave. (Tourist.) Garage.

RIVERSIDE—

Automobile Agents and Dealers.

Collings, J. Walter. (Queen.)

Coop, Leonard G. (Maxwell.)

Daves & McCune.—991 Main St. (Moline.)

Hillegas, E. N.—640 Main St. (Cameron, Stoddard-Dayton.)

Orange Valley Garage.—948 Main St. (Reo, Jackson, Royal.)

Riverside Garage.—10th St., near Market. (Maxwell.)

Stewart, H. C. (Rambler.)

Young, M. (Ford.)

Garages.

Mission Garage.—757 W. 7th St.

Nelson, Axel.—8th St., between Orange and Lemon Sts.

Riverside Auto Transfer Co.

Rubidoux & Riverside Auto Co.

SACRAMENTO—

Clubs and Associations.

Sacramento Automobile Club.

Automobile Agents and Dealers.

Capital Machine & Auto Co.—8th St. between I and J Sts. (Ford, Soules.)

Harvey, L.—Between M and N Sts. (Rambler.)

Phillips, S. M. (Autocar, Columbia.)

Western Motor Car Co.—1004-6 K St. (Jewel, Reo, Stoddard-Dayton, Maxwell.)

Garages.

Schneer, Jos. J.—1009 North J. St.

Sulson Garage Company.

SALINAS—

Garages.

Logan Cycle Co.—320 Main St.

SAN BERNARDINO—

Automobile Agents and Dealers.

Moore, F. C. (Maxwell.)

Garages.

Leedom Bros.

SAN DIEGO—

Clubs and Associations.

Lakeside Inn Track Ass'n.—E. C. Hickman, Sec.

Automobile Agents and Dealers.

Kessler Machine & Supply Co. (Maxwell.)

Up-to-date Garage.—1141 1st St. (Reo). Garage.

Garages.

Hunt Automobile Co.—522 7th St.

Up-to-date Garage.—1141 1st St. (Reo.)

CALIFORNIA (Continued)

SAN FRANCISCO—

Clubs and Associations.

Automobile Club of California.—F. W. McNear, Sec. 415 Montgomery St.
California Women's Automobile Club.
San Francisco Automobile Trade Ass'n.

Automobile Agents and Dealers.

Active Auto Co.—605 Van Ness Ave. (Mora, Commerce, Detroit.)

Anderson, W. F.—7th and Harrison Sts. (Reliance.)

Auto Co. of California.—387 Golden Gate Ave. (Knox truck.)

Auto Livery Co.—Cor. Golden Gate and Van Ness Aves. (Peerless.)

Auto Vehicle & Supply Co.—1841 Market St. (Rapid.)

Auto Vehicle Co.—540 Golden Gate Ave. (Tourist.)

Boyer Motor Car Co.—408 Golden Gate Ave. (Royal, Franklin.)

California & Nevada Auto Co.—1363 Bush St. (Stearns.)

Carmichael-Bray Co.—370 Golden Gate Ave. (Elmore.) Garage and repairing.

Cartercar Automobile Co. (Cartercar.)

Century Automobile Co.—450 Golden Gate Ave. (Kissel Kar.)

City Hall Automobile Co.—66 Fulton St. (De Luxe, Auburn, American Mors.)

Crescent Garage. — McAlister and Gough Sts. (Moline.)

Cuyler, Lee.—453 Golden Gate Ave. (Packard, Cadillac.)

Dow & Whitman.—113-115 Golden Gate Ave. (Rambler.) Repairing and garage.

Dragon Automobile Co.—524 Golden Gate Ave. (Dragon.)

Elliot & Coleman.—339 Bush St. (American.)

Freed, A.—1507 Market St. (Gale, Model.)

Freeman, Brewster & McCabe.—455 Golden Gate Ave. (Aerocar.)

General Motor Car Co.—14th and Valencia. (Locomobile, Fiat.)

Hayes & Dam, 428 Golden Gate Ave. (Frayser-Miller, Rainier.)

Haynes Motor Car Co.—1030 Golden Gate Ave. (Haynes.) Repairing.

Howard Auto Co.—489 Golden Gate Ave. (Buick.)

Huber Automobile Co.—378 Golden Gate Ave. (Smith, Marvel, Richmond.)

Jeffrey & Co., Thos. B.—121 Valencia St. (Rambler.)

Knight, H. A.—1911 Page St. (Austin.)

CALIFORNIA—San Francisco (Cont.)

Lambert Auto Co.—343 Golden Gate Ave. (Lambert.)
 Laugenour, Henry.—625 Ashbury St. (Dolson.)
 Leavitt & Co., J. W.—441 Golden Gate Ave. (Cleveland, Rep, Stoddard-Dayton.)
 Linz-Sanborn Auto. Co.—507 Golden Gate Ave. (Maxwell, Dayton.)
 Lozier Automobile Agency.—132 Valencia Ave. (Lozier.)
 Martland Automobile Co.—152 12th St. (Glide.)
 Matheson Co., of California.—434 Golden Gate Ave. (Matheson.)
 Mauvias Motor Car Co.—489 Golden Gate Ave. (Heine-Velox.)
 McCord, Don C.—408 Golden Gate Ave. (American Mercedes.)
 Middleton Motor Car. Co.—550 Golden Gate Ave. (Corbin, Columbia, Auto-car.)
 Miner, F. G. (Fiat.)
 Mobile Carriage Co.—762 Golden Gate Ave. (Pierce-Arrow, Knox.)
 Motor Car Agencies Co.—445-449 Golden Gate Ave. (Wayne, Moon, Logan, Renault, Johnson.)
 Newman, J. E.—1841 Market St. (Rapid.)
 Northern Auto Co.—402 Golden Gate Ave. (Northern.)
 Hunter Automobile Co., Ossen.—407 Golden Gate Ave. (Mitchell.) Repairing.
 Pacific Motor Car Co.—376 Golden Gate Ave. (Stevens-Duryea, Woods Electric.)
 Pierce Co., The George N.—762 Golden Gate Ave. (Pierce-Arrow.)
 Pioneer Auto Co.—901 Golden Gate Ave. (Thomas Flyer, Thomas Detroit, Oldsmobile, Winton, Isotta-Fraschini, Mercedes, Simplex, Panhard.)
 Pitman & Nelson Auto Co.—491 Golden Gate Ave. (Page-Adrian.)
 Powers, A. H. (Waltham.)
 Rarig Auto & Garage Co.—538 Golden Gate Ave. (National.)
 Renstrom Co., Frank O.—424 Stanyan Ave. (York Pullman.) Garage and repairing.
 Sherwood, H. (Monarch.)
 Slossen, E. P.—1788 Fell St. (Premier, Crawford.)
 Standard Motor Car Co.—503 Gate Ave. (Acme, Ford, Soules, Babcock.)
 Studebaker Bros., of California.—Market and Tenth Sts. (Studebaker.)
 Thorpe, B. E.—117 W. 16th St. (Jewel.)

CALIFORNIA—San Francisco (Cont.)

West Coast Motor Car Co.—389 Golden Gate Ave. (Darracq.)
 White Co.—1780 Market St. (White.)
 Winton Motor Carriage Co. (Winton.)
Automobile Manufacturers, Gasolene.
 Sunset Automobile Co.
Automobile Manufacturers, Gasolene Commercial.
 Heine-Velox Motor Car Co.
Garages.
 Automobile Co.—365 Fell St.
 Carmichael-Bray Co.—370 Golden Gate Ave. (Elmore.) Repairing.
 Central Park Auto Garage.—1185 Market St.
 Dow & Whitman.—113-115 Golden Gate Ave. (Rambler.) Repairing.
 Motor Vehicle Co.—1841 Market St.
 Reliance Automobile Co.—547-557 Fulton St. Repairing and supplies.
 Renstrom Co., Frank O.—524 Stanyan Ave. (Pullman.) Repairing.
Insurance, Automobile.
 Fireman's Fund Insurance Co.—California and Sansome Sts.
Motorcycle Agents and Dealers.
 Fried, A.—1507 Market St. (Merkel.)
 Hays, A. H., Jr.—428 Golden Gate Ave. (F. N.)
 Hopkins, C. W.—729 Gough St. (Indian.)
Parts and Accessories Manufacturers.
 Diamond Rubber Co.—108-112 Telegraph Ave. Tires.
 Fisk Rubber Co.—1036 Golden Gate Ave. Tires.
 Goodyear Tire and Rubber Co.—Tires.
 Morgan & Wright.—423-433 Golden Gate Ave. Tires.
 Pacific Continental Tire Agency.—671 Golden Gate Ave. Tires.
 Pennsylvania Rubber Co.—512-14 Mission St. Tires.
 Prest-O-Lite Co.—Point Richmond. (Charging station for Prest-O-Lite gas tanks.)
 Republic Rubber Co.—103 Beale St. Tires.
Repairing, Automobile.
 Carmichael-Bray Co.—370 Golden Gate Ave. (Elmore.) Garage.
 Dow & Whitman.—113-115 Golden Gate Ave. (Rambler.) Garage.
 Hunter Automobile Co., Ossen.—407 Golden Gate Ave. (Mitchell.)
 Haynes Motor Car Co.—1030 Golden Gate Ave. (Haynes.)
 Irvin Machine Works.—335 Golden Gate Ave.
 Keaton & Chevalier.—521 Van Ness Ave. Vulvanizers and tire repairing.
 Keenan Bros.—273 Valencia St.
 Reliance Automobile Co.—547-557 Fulton St. Supplies and garage.

CALIFORNIA—San Francisco (Cont.)

Renstrom Co., Frank O.—424 Stanyan Ave. (Pullman.) Garage.

Supply Houses.

Chanslor & Lyon Motor Supply Co.—542-4-6 Golden Gate Ave. Vulcanizing and tire repairing.

Graham & Co., John H.—123 California St.

Hughson & Merton.—438 Market St.; 426 Golden Gate Ave.

Moore, Geo. P. Co., Inc.—721 Golden Gate Ave.

O'Kane Co., J.—528 Golden Gate Ave. Keaton & Chevalier.—521 Van Ness Ave.

Reliance Automobile Co.—547-57 Fulton St. Garage and repairing.

Roos Bros.—Van Ness and Bush St.

Vulcanizing and Tire Repairing.

Chanslor & Lyon Motor Supply Co.—542-4-6 Golden Gate Ave. Supplies.

Keaton & Chevalier.—521 Van Ness Ave.

SAN JOSE—

Clubs and Associations.

Automobile Club of San Jose.

Automobile Agents and Dealers.

Cushings Auto & Cycle Repository. (Model.)

Hunter Automobile Co., Ossen.—50 W. St. John St. (Mitchell.) Repairing.

Wallace, R. L. (Waltham.)

Wolfe, F. D. (Jewel.)

Automobile Manufacturers, Gasolene.

Victory Motor Car Co.

Garages.

Letcher Auto Co.—1st and St. James Sts.

Repairing, Automobile.

Hunter Automobile Co., Ossen.—50 W. St. John St. (Mitchell.)

SAN LUIS OBISPO—

Automobile Agents and Dealers.

San Luis Auto & Machine Co. (Maxwell.)

SAN PEDRO—

Automobile Agents and Dealers.

Marine Supply Co. (Reo.)

SANTA ANA—

Automobile Agents and Dealers.

Blodgett & Co., V. E. (Holsman.)

Hankey & Congdon.—414 Main St. (Pope-Waverley, Tourist.)

Lutz Co., Wm. F.—219-221 E. 4th St. (Buick.) Repairing.

Martin & Son, C. A.—209-211 Main St. (Maxwell, Ford, Moline.) Garage and repairing.

Skinner & Co.—2nd St., bet. Main and Bush Sts. (Reo.)

Wickersheim, E. F.—515 N. Main St. (Jackson.)

Garages.

Auburn Agency.

CALIFORNIA (Continued)

Martin & Son, C. A.—209-211 N. Main St. (Maxwell, Ford, Moline.) Garage and repairing.

Repairing, Automobile.

Lutz & Co., Wm. F.—219-221 E. 4th St. (Buick.)

Martin & Son, C. A.—209-211 N. Main St. (Maxwell, Ford, Moline.) Garage.

SANTA BARBARA—

Garages.

Wood Redington Co.—Cota and Anacapa Sts.

SANTA CLARA—

Parts and Accessories Manufacturers.

Linole Manufacturing Co. Tire fluid.

SANTA CRUZ—

Automobile Agents and Dealers.

Grisinger, A. H. (Northern.)

Garages.

Whiting & Mudgett.

Wood Bros.

SANTA MARIA—

Garages.

Santa-Maria Garage.

Sigler & Pettenger.—Sutherland Bldg.

SANTA MONICA—

Automobile Agents and Dealers.

McPherson, A. M. (Reo.)

Santa Monica Garage. (Maxwell.)

Garages.

Carter, C. C.

Gillis, Jones & Miller.

SANTA ROSA—

Automobile Agents and Dealers.

Santa Rosa Garage.—5th St. (Winton.)

Schilling, Mr. (Maxwell.)

SINSON—

Garages.

Sinson Garage Co.

STANFORD UNIVERSITY—

Automobile Agents and Dealers.

Ryan, Harris J. (Waltham.)

STOCTON—

Automobile Agents and Dealers.

California Automobile Co.—318 E. Market St. (Mitchell.)

Wright & West. (Maxwell.)

SUISON (Solano County)—

Automobile Agents and Dealers.

Suison Garage Co., Inc.—Main St. (Mitchell, Oldsmobile, Winton, Autocar, Maxwell, National.)

TULARE—

Garages.

Wightman, Elmer.

UPLAND—

Automobile Agents and Dealers.

Euclid Garage Co.—Euclid Ave. (Gale, Jackson.)

Garages.

Packing House Equipment Co.

VALLEJO—

Garages.

Vallejo Auto Exchange.

CALIFORNIA (Continued)

VENICE—

Garages.

Risley, W. H. Garage.

VENTURA—

Automobile Agents and Dealers.

Mercer, W. E. (Maxwell.)

WOODLAND—

Garages.

Woodland Garage.

COLORADO

AKRON—

Automobile Agents and Dealers.

Jacobs, H. W. (Waltham.)

ALAMOSA—

Garages.

Gable, Frank. Repairing.

Repairing.

Gable, Frank. Garage.

BOULDER—

Automobile Agents and Dealers.

Neiheisel Bros. (White, Smith, Auto-car, Franklin, Jackson, Ford.)

Wright, C. H. (Holsman.)

BUENA VISTA—

Automobile Agents and Dealers.

Cochran, H. T. (Waltham.)

Wright, Jr., A. E.—Main St. (Reo, Premier.)

CANON CITY—

Clubs and Associations.

Canon City Automobile Club. Dr. Otis Orendorff, Sec.

Automobile Agents and Dealers.

Bunton, Frank L.—318-320 Main St. (Maxwell, Rambler.)

COLORADO SPRINGS—

Automobile Agents and Dealers.

Bower Auto Co.—2120 N. Nevada Ave. (Cadillac.)

Campbell, England & Markscheffle. (Peerless, Franklin, Oldsmobile, Columbus.)

Hager, Wm.—1308 Cascade Ave. (Isotta.)

Howard-Crowingshield, Garage, The.—619 N. Spruce St. (Premier.)

Miller & Wilson Auto Co. (Waltham.)

Western Automobile & Supply Co.—115 N. Cascade Ave. (Oldsmobile, Columbus, Franklin, Peerless.)

Garages.

Miller Auto Co.—122 N. Cascade Ave. Strang, C. G.—10 N. Nevada St. Repairing.

Motorcycle Agents and Dealers.

Blake, G. W. (Merkel.)

Skinner, L. H. (Indian.)

Motorcycle Manufacturers.

Antony Motor & Mfg. Co.

Parts and Accessories Manufacturers.

Weber Cycle & Supply Co. Portable turntables.

COLORADO (Continued)

Repairing, Automobile.

Strang, C. G.—10 N. Nevada St. Garage.

DENVER—

Clubs and Associations.

Colorado Automobile Club.

Denver Automobile Trade Association.

Automobile Agents and Dealers.

Bilz, Chas.—1432 Court Place. (Packard, Franklin, Buick.)

Botterill, Tom.—1643 California St. (Pierce Arrow.)

Colburn Automobile Co.—15th St. and Colfax Ave. (Locomobile, Rauch & Lang, White.)

Colorado Automobile Co.—1510 Court Place. (Cadillac.)

Crane, J. E.—922-930 18th St. (Second-hand cars.) Garage and repairing.

Cumbe, E. R.—1541 Cleveland Place. (Rambler, Mitchell.)

Felker Automobile Co.—1535 Tremont St. (Stevens-Duryea, Waltham, Pope-Waverley.) Garage and repairing.

Fernald Auto Co.—1548 Broadway. (Maxwell, Auburn.)

Fry, John E.—1562 Broadway. (Apperson.)

Gray Auto Co.—1548 Broadway. (Stanley.)

Hannon, Geo. E.—1441 Welton St. (Jewel, Jackson.)

Havens, Herbert.—1618 Glenarm St. (Lambert, Atlas, Cameron.)

MacFarland-Powell Auto Co.—1618 Glenarm St. (Pope-Hartford.)

Mathewson Auto Co.—1624 Broadway. (Columbus, Thomas Flyer, Oldsmobile, Wood.)

Michaelis-Middlekauff Auto Co.—1650-54 Glenarm St. (Queen.) Garage and repairing.

Nichols, J. Hervey.—1636 Broadway. (Winton.)

Overland Motor Car Co.—1333 Broadway. (Cartercar.)

Reo Auto Co.—1634 Broadway. (Reo, Gale, Premier.)

Shearer Auto Co., S. C.—1650 Glenarm, opp. Denver Club. (Haynes.)

Simplicity Auto Co.—15th St. and Cleveland Place. (Simplicity.)

Smith Auto Co.—1420 Court Place. (Smith, Mora, American, Marvel, Logan.)

Studebaker Bros. Mfg. Co.—Cor. 15th and Blake Sts. (Studebaker.)

Western Auto Co. (Wayne.)

Wilson, A. T.—1548 Broadway. (Ford, Columbus, Dragon, Earl.)

Wood & Barnett.—1333 Broadway. (Stoddard-Dayton.)

Automobile Manufacturers, Gasolene.

Colburn Automobile Co.

COLORADO (Continued)

Garages.

Begole, Geo. D.
Best Auto Repair & Storage Co.—1548 Broadway.

Burke, O.—918 Larimer St.
Crane, J. E.—922-930 18th St. (Second-hand cars.) Repairing.

Felker Automobile Co.—1535 Tremont St. (Stevens-Duryea, Waltham, Pope-Waverley.) Repairing.

Michaelis-Middlekauff Auto Co.—1650-54 Glenarm St. (Queen.) Repairing.

St. John & Son, S. H.—1420 Court Place. Garage.

Motorcycle Agents and Dealers.

Brown & Beck.—1737 Champa St. (American, M. & M.)

Hathaway, S. T.—11th and Wewatta Sts. (Indian.)

Motorcycle Manufacturers.

Brown & Beck.—1737 Champa St.

Parts and Accessories Manufacturers.

Bliss, Chas. P. Automobile tops.

Brooke Patent Airless Tire Co.—1422 Grant Ave. Cellular tires for automobiles and motorcycles.

Continental Caoutchouc Co.—220 16th St. Tires.

Diamond Rubber Co.—1735 Arapahoe St. Tires.

Fisk Rubber Co.—1555 Tremont St. Tires.

Goodrich Co., B. F.—1536 Glenarm St. Tires.

Goodyear Tire & Rubber Co.—220 16th St. Tires.

Jackson Mfg. Co.—614 7th St. Battery boxes.

Republic Tire Co.—1562 14th St. Tires.

Robertson & Doll. Automobile tops.

Repairing, Automobile.

Agou & McLagou.—1131 Welton St.
Auto Livery & Repair Co.—1426 Glenarm St.

Bratt, Ande.—1548 Broadway.

Crane, J. E.—922-930 18th St. (Second-hand cars.) Garage.

Felker Automobile Co.—1535 Tremont St. (Stevens-Duryea, Waltham, Pope-Waverley.) Garage.

Kent, E. R.—1754 Welton St.

Michaelis-Middlekauff Auto Co.—1650 1654 Glenarm St. (Queen.) Garage.

Williams, Fred.—224 16th St.

FORT MORGAN—

Automobile Agents and Dealers.

Cowen, H. (Waltham.)

GREELEY—

Clubs and Associations.

Weld County Automobile Club. Frank I. Ewing, Sec.

COLORADO (Continued)

HOLLY—

Automobile Agents and Dealers.

Griswold, A. H. (Jackson, Rambler.)

JULESBURG—

Automobile Agents and Dealers.

Babcock, Dr. Myron L. (Waltham.)

LA JUNTA—

Automobile Agents and Dealers.

Norton Auto Co., S. E.—14 E. 1st St. (Waltham.)

LONGMONT—

Clubs and Associations.

Longmont Automobile Club. H. L. Large, Sec.

MONTE VISTA—

Automobile Agents and Dealers.

Stutsman & Co., C. B. (Ford, Gale, Reliable-Dayton.)

PUEBLO—

Automobile Agents and Dealers.

Cuddeback, F. L. (Waltham.)

Fowler, C. W. (Reo.)

Pueblo Automobile Co.—Cor. Court and 4th Sts. (Pope-Waverley, Dragon, Ford, Frayer-Miller, Cameron.)

Pueblo Novelty Works.—310 N. Main St. (Rambler.)

Garages.

Griggs Automobile & Bicycle Co.—418 Sante Fe Ave.

SALIDA—

Automobile Agents and Dealers.

Gartin, Burt & Adams, David. (Franklin.)

VILAS—

Automobile Agents and Dealers.

Wheeler, C. F. (Waltham.)

CONNECTICUT

ANSONIA—

Parts and Accessories Manufacturers.

Ansonia Electrical Co. Bells.

Gaylord Co., F. L.—Brass, bronze, aluminum and copper castings, tire chains.

BANTAM—

Garages.

Bantam Anti-Friction Co.

Parts and Accessories Manufacturers.

Bantam Anti-Friction Co. Ball bearings.

BRANFORD—

Garages.

Barnes, John C.

Parts and Accessories Manufacturers.

Malleable Iron Fittings Co. Malleable iron castings, steel castings.

BRIDGEPORT—

Clubs and Associations.

Automobile Club of Bridgeport. Dow R. Beebe, Sec.

CONNECTICUT (Continued)

Automobile Agents and Dealers.

Aston, T. R. (Wayne.)
Automobile Repair Co.—Kossuth St. (Knox.)

Blue Ribbon Garage.—291 Fairfield Ave. (Columbia, Winton, Cadillac, Franklin, Lozier.) Garage, supplies, repairs.

Brandegge Automobile Co.—625 State St. (Stevens-Duryea.)

Bridgeport Automobile Co.—388 Fairfield Ave. (Pope-Hartford, Pope-Toledo, Baker.)

Franklin Garage.—163 John St. (Holzman, Crawford.)

Leyford Bros.—625 E. Washington Ave. (Oldsmobile.)

Locomobile Co. of America.—Seaside Park. (Locomobile.)

Miller Garage Co.—554-8 Fairfield Ave. (Aerocar, Glide, Maxwell.) Supplies, repairing, garage.

Mitchell Agency of Bridgeport, Conn. (Mitchell.)

Page & Co., Carl. (Peerless.)

Vanstone, C. W. (Knox.)

Automobile Manufacturers, Gasolene.

Locomobile Co of America, The.—Seaside Park.

Automobile Manufacturers, Gasolene Commercial.

Miller Motor Car Co.—554 Fairfield Ave.

Garages.

Aston Automobile Repair and Storage Co., T. R.—1185 State St.

Blue Ribbon Garage.—291 Fairfield Ave. (Columbia, Winton, Cadillac, Franklin, Lozier.) Repairs and supplies.

Miller Garage Co.—554-8 Fairfield Ave. (Aerocar, Glide, Maxwell.) Repairs, supplies.

Roth, Robert.—1423 North Ave.

Motorcycle Agents and Dealers.

Bridgeport Cycle Co. (Indian.)

Parts and Accessories Manufacturers.

Acme Oil Engine Co.—Union Ave. Kerosene motors.

American & British Mfg. Co.—Crescent Ave. Automobile and marine motors, connecting rods, crank shafts, drop forgings, pressed steel frames, levers, steering apparatus.

American Tube & Stamping Co. Channels, oil cans, steel rims, steel tubing.

Apstein, D. Tire plugs.

Automatic Machine Co., The. Gasoline marine motors.

Belknap Mfg. Co. Pipe and brass fittings.

Blue Ribbon Auto and Carriage Co.—130-70 Cannon St. Wood and metallic bodies, automobile tops.

CONNECTICUT (Continued)

Bridgeport Brass Co. Sheet and rod brass and copper, fuel pumps, tire pumps, tubing.

Bridgeport Coach Lace Co.—805 Wood Ave. Cloth and carpet trimmings.

Bridgeport Crucible Co. Crucibles.

Bridgeport Deoxidized Bronze and Metal Co. Aluminum, brass, bronze and copper castings, bronze metals.

Bridgeport Electric Plating Co. Galvanizing, wrought iron and steel pipe.

Bridgeport Hardware Mfg. Co.—461-69 Iraniston Ave. Screw drivers, auto drivers, plyers, saws, wire cutters, hack saws, etc.

Bridgeport Malleable Iron Co. Gray iron castings, malleable iron castings.

Bridgeport Motor Co. Gasoline marine motors.

Bridgeport Vehicle Co.—Water and South Ave. Bodies, tops, slip covers, tool bags, wind shields, fenders, hoods.

Bullard Machine Co. Special automobile machinery.

Columbia Bolt & Nut Co.—1500 Railroad Ave. Lock nuts.

Eaton, Cole and Burnham Co., The. Brass, iron and steel valves, cocks, fittings, pipe cutting and threading tools and machines.

Fairfield Motor Co.—172 Cannon St. Electric and gasoline marine motors.

Grand Mfg. & Machine Co.—90 Slilman Ave. Spark plugs, carbureters, gasoline engines.

Kilborn & Bishop Co., The.—Lloyd, cor. Chapel Sts. Drop forgings, tools.

Killam, Henry.—Chestnut and Wooster Sts. Wood and metallic bodies.

Liberty Bell Co. Bells.

Liquid Fuel Engineering Co. Gasoline and kerosene burners.

Pacific Iron Works, Inc. Machine work to order.

Parrot Varnish Co. Varnishes.

Royal Equipment Co.—165 Housatonic Ave. Brakes.

Spring Perch Co.—232 John St. Springs, curtain rollers.

Wheel and Wood Bending Co., The.—Top bows, wood wheels, wood bendings.

White Mfg. Co.—Cannon St. Lamps, metal trimmings.

Repairing, Automobile.

Blue Ribbon Garage.—291 Fairfield Ave. (Columbia, Winton, Cadillac, Franklin, Lozier.) Garage and supplies.

Miller Garage Co.—554-8 Fairfield Ave. (Aerocar, Glide, Maxwell.) Garage and supplies.

CONNECTICUT (Continued)

Supply Houses.

Blue Ribbon Garage.—291 Fairfield (Columbia, Winton, Cadillac, Franklin, Lozier.) Garage and supplies.
Miller Garage Co.—554-8 Fairfield Ave. Aerocar, Glide, Maxwell.) Garage and repairs.

BRISTOL—

Automobile Agents and Dealers.

Mason & Co., C. V. (Autocar.)
Sessions, J. B. (Locomobile.)
Automobile Manufacturers, Gasoline.
Desmarais & Co.—Prospect St.

Garages.

Bossett, E. G.—146 Main St.
Parts and Accessories Manufacturers.
Dunbar Bros. Machinery springs.
New Departure Mfg. Co. Bells, ball bearings.
Sessions Foundry Co. Gray iron castings.
Wallace Barnes Co., The. Machinery springs, seat springs.

CANAAN—

Automobile Agents and Dealers.

Canfield Automobile Station. (Knox, Stevens-Duryea, Waltham.) Garage and repairing.

Garages.

Canfield Automobile Station. (Knox, Stevens-Duryea, Waltham.) Repairing.

Repairing, Automobile.

Canfield Automobile Station. (Knox, Stevens-Duryea, Waltham.) Garage.

CENTERBROOK—

Automobile Agents and Dealers.

Wright, Northam. (Rambler.)

CHESTER—

Garages.

Shailer, F. S.
Tyler, F. W.

COS COB—

Motorboat Manufacturers.

Palmer Bros.

Parts and Accessories Manufacturers.

Mianus Motor Works. Marine motors.
Palmer Bros. Marine motors.

DANBURY—

Automobile Agents and Dealers.

Baisley, F. H.—10 Crane St. (Cameron.)
Danbury Hardware Co.—249-51 Main St. (Rambler.) Supplies.
Green, Jr., J. W.—Main St. (Winton.)
Haviland, C. G.—27 Stevens St. (Ford.)
Pyramid Motor Car Co.—29 New St. (White, Pope line, Cadillac.)

Garages.

Dann's Auto Station, J. T.—314 Main St. Supplies and repairs.

CONNECTICUT (Continued)

Repairing, Automobile.

Dann's Auto Station, J. T.—314 Main St. Garage and supplies.
Fellow Garage, A. H.—87 West St.
Supply Houses.
Danbury Hardware Co.—249-51 Main St. (Rambler.)
Dann's Auto Station, J. T.—314 Main St. Garage and repairs.

DANIELSON—

Automobile Agents and Dealers.

Nado, Louis A. (Rambler.)
Garages.
Boswell, Geo. C.—Broad St.

DERBY—

Automobile Agents and Dealers.

Biever, L. N.—56 Elizabeth St. (Maxwell.)
Derby Automobile Co.—Seymour Ave. (Franklin, Haynes, Cadillac.)
Lombardi Motor Co.—71 Minerva St. (Oldsmobile.)
Parts and Accessories Manufacturers.
Lombardi Motor Co.—71 Minerva St. Flexible tubing, speed meters.

EAST HAMPTON—

Parts and Accessories Manufacturers.

Bevin Bros. Mfg. Co. Bells.
East Hampton Bell Co. Bells.
Gong Bell Mfg. Co. Bells.

ESSEX—

Automobile Agents and Dealers.

Beebe, O. N. (Locomobile, Cadillac, Winton.)

Parts and Accessories Manufacturers.

Tiley-Pratt Co. Nipples, power driven tire pumps.

FAIRFIELD—

Parts and Accessories Manufacturers.

Fairfield Rubber Co. Rubber cloth.

GREENWICH—

Automobile Agents and Dealers.

Allen Asten & Co.—Greenwich Ave. (Locomobile, Reo.)
Empire Auto Co. (Maxwell.)
Fowler Bros.—Putnam Ave. (Ford.)
Minchin, C. H.—157 Greenwich Ave. (Waltham.)
Moshier, Frank P., Jr. (Ford.)

Garages.

Greenwich Automobile Station.—Cor. Greenwich and Boston Post Road. Repairing.

Repairing, Automobile.

Greenwich Automobile Station.—Cor. Greenwich and Boston Post Road. Garage.

GUILFORD—

Garages.

Norton, C. E.—Water St.

Parts and Accessories Manufacturers.

Spencer's Sons, I. S. Brass, bronze, aluminum, copper and gray iron castings.

HAMPTON—

Parts and Accessories Manufacturers.

Hill, N. N., Brass Co. Bells.

CONNECTICUT (Continued)

HARTFORD—

Clubs and Associations.

Automobile Club of Hartford. G. K. Dustin, Sec.

Connecticut Automobile Association.
Neighborhood Touring Club, The.

Automobile Agents and Dealers.

Ashwell, Robt.—45 Vine St. (Franklin.)

Britton, R. D. & C. O. Co., The.—
115-121 Allyn St. (Maxwell.) Repairing.

Brown, Thompson & Co.—Main St. (Packard, Cadillac, Stevens-Duryea.)

Capitol City Auto Hack & Livery Co. 176 Allyn St. (Mitchell.)

Connecticut Steel and Wire Co.—308 Pearl St. (Reo.)

Elmer Auto Co.—1100 Main St. (Ford, Rambler.)

Fiske, L. D.—43 Wells St. (Fiat, Panhard, Locomobile.)

Lazaro, Albert E. (Compound.)

Miner Garage Co.—Cor. High and Allyn Sts. (Buick, Pierce Arrow, Knox, Pope-Waverly, Haynes.)

Palace Auto Station Co., Inc.—348 Trumbull St. (Thomas Flyer, Autocar, Oldsmobile.) Garage.

Riggs, T. D., S. & M. (Isotta.)

Automobile Manufacturers, Electric.

Electric Vehicle Co., The.

Automobile Manufacturers, Electric, Commercial.

Electric Vehicle Co., The.

Automobile Manufacturers, Gasolene.

Electric Vehicle Co., The.

Pope Mfg. Co.

Automobile Manufacturers, Gasolene Commercial.

Pope Motor Car Co.

Automobile Manufacturers, Gasolene-Electric.

Electric Vehicle Co., The.

Garages.

Connecticut Motor Car Co.—321 Garden St.

Franklin Garage.

Gates, Geo. W.—35 Aren St.

Palace Auto Station, Inc.—348 Trumbull St. (Thomas Flyer, Autocar, Oldsmobile.)

Insurance, Automobile.

Travelers Insurance Co. Liability and accident.

Motorcycle Agents and Dealers.

Smith, Alex.—35 Mulberry St. (Indian.)

Motorcycle Manufacturers.

Pope Mfg. Co.

***Parts and Accessories Manufacturers.**

Billings & Spencer Co. Tools, machine tools, forgings, drop hammers.

CONNECTICUT (Continued)

Blake, Edwin J.—565 Winslow St. Brass, bronze, aluminum and copper castings, bronze metals.

Capitol Foundry Co.—Gray iron castings.

Carlyle Johnson Machine Co., The.—356 Asylum St. Clutches, marine reverse gears.

Connecticut Steel & Wire Co.—308 Pearl St. Trunk racks, automobile trunks, adjustable automobile seats.

Connecticut Supply Co.—Hartford Life Insurance Bldg. Washing apparatus.

Elastro Mfg. Co., The.—26 State St. Tire fluid.

Gray & Prior Machine Co. Gasoline marine motors, universal joints.

Hart & Hegeman Mfg. Co. Electric switches.

Hartford Auto Body Works.—809 Asylum Ave. Wood and metallic bodies, automobile tops, glass wind shields.

Hartford Auto Parts Co.—Howard Bldg. Steering apparatus, universal joints.

Hartford Machine Screw Co.—476 Capital Ave. Steel balls, bolts and nuts, brake and clutch cork inserts, ball cups, cups and cones, gear blanks, gear wheels, metal gear wheels, hub caps, special automobile machinery, machine work to order, nipples, lock nuts and washers, machine screw products, screws, washers.

Hartford Pattern & Model Co.—14 Hicks St. Patterns.

Hartford Rubber Works Co.—691 Park St. Pneumatic, solid and cushion tires.

Kinsler-Bennett Co.—62 Market St. Universal joints.

Knox, Frank J. Co., The. Water column mirrors.

Mutual Machine Co.—25 Wells St. Universal joints, gear cutting.

Pratt & Whitney Co., The. Special automobile machinery.

Richardson Engineering Co. Charging apparatus, electric motors, spark plugs.

Skat Mfg. Co.—791 Park St. Hand soap.

Standard Foundry Co. Brass, bronze, aluminum and copper castings.

Sweet, Charles F.—61 Market St. Grease, oil, automobile body polishes, automobile body soaps.

Tucker, C. F. Oil cups, oil guns.

Vanderbeek Tool Works. Tools, universal joints.

Veeder Mfg. Co.—Cor. Garden and Sargeant Sts. Cyclometers, odometers, tachometers, tachodometers, counters, small castings.

Vehicle Specialty Co.—32 Union Place. Washing apparatus.

CONNECTICUT (Continued)

Whitlock Coil Pipe Co., The.—Elmwood St. Radiators, coolers, hoods, exhaust, inlet and water pipes.

Whitney Mfg. Co. Chains, vises, milling machines.

Wiley & Son Co., Wm. H. Storm aprons, curtains, automobile and lamp covers, tire cases, leggins.

Repairing, Automobile.

Britton Co., The R. D. & C. O.—115-121 Allyn St. (Maxwell.)

Supply Houses.

Pope Mfg. Co.—436 Capitol Ave. Dealers and jobbers in all supplies.

Post & Lester Co.—Sergeant St. Dealers and jobbers.

IVORYTOWN—

Automobile Agents and Dealers.

Behrens & Bushwell.—Main St. (Cadillac, Winton, Stevens-Duryea.) Garage and repairing.

Garages.

Behrens & Bushwell.—Main St. (Cadillac, Winton, Stevens-Duryea.) Repairing.

Repairing, Automobile.

Behrens & Bushwell.—Main St. (Cadillac, Winton, Stevens-Duryea.) Garage.

JEWETT CITY—

Garages.

Jewett City Auto Station.

MANCHESTER—

Automobile Agents and Dealers.

House, C. E. (Pope-Hartford.)

Manchester Auto Garage.—61 N. Main St. (Lambert.)

Parts and Accessories Manufacturers.

Norton Electrical Instrument Co. Ammeters, voltmeters.

MERIDEN—

Automobile Agents and Dealers.

Bow & Son, A.—231 W. Main St. (Reo, Premier.)

Connecticut Electric Equipment Co.—15 Church St. (Corbin.)

Meeks, Dr. H. A.—88 E. Main St. (Stevens-Duryea, Pope-Hartford.)

Roberage, J. A. (Knox, Winton, Cadillac, Haynes.)

Garages.

Meriden Auto Station.—41 W. Main St.

Parts and Accessories Manufacturers.

Connecticut Telephone & Electric Co., Inc.—70 Britannia St. Spark coils, timers, switches, volt and ampere meters, coil current indicators, gasoline gauges.

MIANUS—

Motorboat Manufacturers.

Mianus Motor Works.

Repairing, Automobile.

Mianus Garage.

CONNECTICUT (Continued)

MIDDLETOWN—

Automobile Agents and Dealers.

Caulkins & Co., F. L.—405-415 Main St. (Cadillac, Knox, Winton, Pope-Hartford.) Supplies, garage and repairs.

Russell, T. M. (Locomobile.)

Automobile Manufacturers, Gasolene.

Eagle Motor Car Co.

Garages.

Caulkins & Co., F. L.—405-455 Main St. (Cadillac, Knox, Winton, Pope-Hartford.) Supplies and repairing.

Parts and Accessories Manufacturers.

Frisbie Motor & Machine Works.—Automobile and marine motors.

Hubbard Motor Co.—Gasoline automobile and marine motors.

Middletown Auto Body Co.—Wood and metallic bodies.

Wilcox, Crittenden & Co. Gray iron castings.

Repairing, Automobile.

Caulkins & Co., F. L.—405-415 Main St. (Cadillac, Knox, Winton, Pope-Hartford.) Supplies and garage.

Supply Houses.

Caulkins & Co., F. L.—405-415 Main St. (Cadillac, Knox, Winton, Pope-Hartford.) Garage and repairing.

MILFORD—

Automobile Agents and Dealers.

Clarke, W. S.—Cor. Broad and River Sts. (Ford, Lambert.)

MILLDALE—

Parts and Accessories Manufacturers.

Clark Bros. Bolt Co. Bolts, nuts, washers, screws.

MOUNT CARMEL—

Parts and Accessories Manufacturers.

Woodruff & Sons Co., Walter W. Hardware mountings and specialties.

MYSTIC—

Parts and Accessories Manufacturers.

Lathrop, J. M. Marine motors.

NAUGATUCK—

Automobile Agents and Dealers.

Page & Co., J. M. (Holsman.)

Parts and Accessories Manufacturers.

Naugatuck Malleable Iron Co. Carburetor ball floats, malleable iron castings.

NEW BRITAIN—

Clubs and Associations.

Automobile Club of New Britain. W. L. Hatch, Sec.

Automobile Agents and Dealers.

Central Automobile Station.—236 Main St. (Stevens-Duryea.) Garage and repairing.

Gladding, Leon A.—123 Main St. (Pope-Hartford.)

Corbin Motor Vehicle Corp.—Elm and Chestnut Sts. (Corbin.)

CONNECTICUT (Continued)

Automobile Manufacturers, Gasolene.
Corbin Motor Vehicle Corporation.
Automobile Manufacturers, Gasolene
Commercial.

Corbin Motor Vehicle Corporation.

Garages.

Central Auto Station.—236 Main St.
(Stevens-Duryea.) Repairing.

Parts and Accessories Manufacturers.
The Corbin Screw Corporation. Motor cycle brakes, hubs, screw machine products.

New Britain Brass Co. Brass pipe fittings.

North & Pfeiffer Mfg. Co.—72 Chestnut St. Spark plugs.

Repairing, Automobile.

Central Automobile Station.—236 Main St. (Stevens-Duryea.) Garage.

NEW CANAAN—

Garages.

Johnson Carriage Co.—Forest St. and East Ave. Repairing and supplies.

Repairing.

Johnson Carriage Co.—Forest St. and East Ave. Garage and supplies.

Supply Houses.

Johnson Carriage Co.—Forest St. and East Ave. Repairing and garage.

NEW HAVEN—

Clubs and Associations.

Yale University Automobile Club.
G. H. Townsend, Sec.

Automobile Agents and Dealers.

Automobile & Supply Corp., The.—67-69 Broadway. (Buick, Locomobile.)

Beck, M. J. (Lambert.)

Buckman & Law.—442 State St. (Rambler.)

Central Auto Co.—839 Chapel St. (Maxwell.)

Central Automobile Co.—11 Crown St. (Stoddard-Dayton, Maxwell.)

Continental Auto Mfg. Co., The.—St. John and Olive Sts. (Columbus.) Supplies and repairing.

Dennison, Julien. (Atlas.)

Fournier, A. (Atlas.)

Hale, E. T. (University Garage.)—St. John and Olive Sts. (Knox.)

Holcomb Co.—105 Goffe St. (Cadillac, Franklin.) Garage and repairing.

Johnson, Alfred.—87-97 Orange St. (Springfield.)

Knight's Central Garage.—261 George St. (Ford.)

Maynard, W. A.—68 Gilbert St. (Thomas Flyer, Autocar.)

New Haven Auto Corp.—53 Broadway. (Pope line.)

Perry, F. R.—851 Whitney Ave. (Jackson.)

Pfizenmayer, C. A. F.—Duncan Hall. (Winton.)

CONNECTICUT (Continued)

Reichert Automobile Co.—34-44 Temple St. (Haynes, Waltham.) Garage, repairing and supplies.

Reo Motor Agency.—100 York Sq. (Reo.)

University Garage Co.—St. John and Olive Sts. (Wayne.) Garage and supplies.

White Garage, The.—666 State St. (White.)

Whitfield, N. B.—143 Park St. (Oldsmobile.)

Automobile Manufacturers, Gasolene.
Continental Automobile Co.

Garages.

Arron Automobile Co.—161 Commerce St.

Buell & Co., D. H.—516 State St.

Harrell, Geo. H.—685 Chapel St.

Holcomb Co.—105 Goffe St. (Cadillac, Franklin.) Repairing.

Reichert Automobile Co.—34-44 Temple St. (Haynes, Waltham.) Repairing, supplies.

Russell, W. C.—666 State St.

University Garage Co.—St. John and Olive Sts. (Wayne.) Supplies.

Motorcycle Agents and Dealers.

Cox, John F.—508 State St. (Indian.)

Parts and Accessories Manufacturers.

Armstrong & Co., M.—433 Chapel St. Wood and metallic bodies.

Beebe, A. M.—441 Elm St. Automobile tops.

Belden Machine Co.—Whalby Ave. and Tryan St. Drop forgings and hardware specialties.

Bowers Co., Inc., The F. E.—307 First National Bank Bldg. Carbureters.

Cowles & Co., C. Annunciators, bow separators, watch holders, lamps and metal trimmings.

Dann Bros. & Co., The.—84 Franklin St. Bent wood, bodies, seats, dashes and fenders, laminated wood roof panels, general wood work to specification.

Demorest, A. I. Wood and metallic bodies.

Driven, B. D.—71 Hamilton St. Top fixtures.

Elm City Brass Co.—Brass, bronze, aluminum and copper castings.

English & Mersick Co. Watch holders, lamps, name plates, top fixtures, metal trimmings.

Geometric Tool Co.—Blake and Valley Sts. Special automobile machinery.

Gilbert Mfg. Co. Fabric supplies, metal specialties.

Graham & Co., James.—293 Wooster St. Composition brass, copper and aluminum castings, babbitt metals.

CONNECTICUT (Continued)

Hendryx & Co., Andrew B. Brass, bronze, aluminum and copper castings.
 Holcomb, H. C.—105 Goffe St. Wood and metallic bodies, automobile covers, lamps, automobile tops.
 Horton, H. A.—127-131 Park St. Wood and metallic bodies.
 Mayo Radiator Co. Hoods, radiators.
 Miner & Peck Mfg. Co. Forge equipment.
 National Pipe Bending Co.—River and Lloyd Sts. Coils and bends of iron, brass and copper pipe.
 New Haven Button Co. Buttons.
 New Haven Carriage Co. Wood and metallic bodies, wood wheels.
 New Haven Copper Co. Sheet and rod brass and copper, brass and copper metals.
 Petrie, John. Brass fittings, pipe.
 Rattan Mfg. Co.—522 State St. Hammers.
 Rosenbluth & Co., A. J.—106 Park St. Enamel.
 Scoville & Peck.—15 Wooster St. Lamps and generators.
 Seabrook & Smith Carriage Co.—126 Park St. Wood and metallic bodies.
 Seward & Son Co., M.—Hardware, spring clips, drop forgings.
 Shepard & Sons.—Seat panels, body stock, frames, bows.
 Smith, Wm. J. Co. Special automobile machinery.
 Snow & Petrelli Mfg. Co. Marine reverse gears.
Repairing, Automobile.
 Archer, Wesley R.—79 West St.
 Continental Auto Mfg. Co., The.—St. John and Olive Sts. (Columbus.) Supplies.
 Holcomb Co.—105 Goffe St. (Cadillac, Franklin.) Garage.
 Reichert Automobile Co.—34-44 Temple St. (Haynes, Waltham.) Garage and supplies.
 Rowland Motor Co.—Chapel and Wallace Sts.
Supply Houses.
 Continental Auto Mfg. Co., The.—St. John and Olive Sts. (Columbus.) Repairing.
 Reichert Automobile Co.—34-44 Temple St. (Haynes, Waltham.) Supplies, repairing, garage.
 University Garage Co.—St. John and Olive Sts. (Wayne.) Supplies and garage.

NEW LONDON—

Automobile Agents and Dealers.

Dickinson, J. B. (Logan.)
 Hasbrouck Motor Works, Inc., The.—155 Water St. (Rambler.)
 Monte Cristo Garage. (Pullman.)

CONNECTICUT (Continued)

Newcomb, F. S.—Post Hill. (Maxwell.)
 New London Automobile Station.—94 Main St. (Thomas Flyer, Thomas Detroit, Haynes.) Garage and repairing.
Garages.
 Crocker House Garage.—Golden St.
 New London Automobile Station.—94 Main St. (Thomas Flyer, Thomas Detroit, Haynes.) Repairing.
 Pequot Garage.—Pequot Ave. Repairing.
 Starr, W. H.—88 Green St.
Parts and Accessories Manufacturers.
 Hasbrouck Motor Works, Inc.—155 Water St. Gasoline marine motors.
 Hopson & Chapin Mfg. Co. Pattern makers, brass and nickel plating, machine work to order, gray iron castings.
 New London Motor Co.—Gasoline motors.
Repairing, Automobile.
 New London Auto Station.—94 Main St. (Thomas Flyer, Thomas Detroit, Haynes.) Garage.
 Paquot Garage.—Pequot Ave. Garage.

NEW MILFORD—

Garages.

Arcade Machine Works.

NIANTIC—

Automobile Agents and Dealers.

Dickinson, J. B. (Dolson, Logan.)

NOANK—

Parts and Accessories Manufacturers.

Noank Motor Works. Gasoline marine motors.

NORFOLK—

Automobile Agents and Dealers.

Lockwood & Co., F. E. (Locomotive.)

NORWALK—

Automobile Agents and Dealers.

De Klyn, W. F. (Rapid.)
 Lockwood & Co., F. E.—39 Wall St. Locomobile, Waltham, Autocar, Elmore, White.) Garage, repairing and supplies.
 Sturges, Percy. (Oldsmobile, Cadillac, Pope-Hartford.)

Garages.

Colby, John W.
 Franklin, Judge.
 Lockwood & Co., F. E.—39 Wall St. (Locomotive, Waltham, Autocar, Elmore, White.) Repairing and supplies.

Parts and Accessories Manufacturers.

Norwalk Brass Co. Brass, bronze, aluminum and copper castings.

Repairing, Automobile.

Lockwood & Co., F. E.—39 Wall St. (Locomotive, Waltham, Autocar, Elmore, White.) Supplies and garage.

CONNECTICUT (Continued)

Supply House.

Lockwood & Co., F. E.—39 Wall St. (Locomobile, Waltham, Autocar, Elmore, White.) Repairing and garage.

NORWICH—

Automobile Agents and Dealers.

Baird & Swan.—276-278 Main St. (Cadillac, Oldsmobile, Pope-Waverley, Pope-Hartford.)

Ford Agency.—127 Franklin St. (Ford.)

Ring, M. B.—19 Chestnut St. (Maxwell.)

Garages.

Coit, S. J.—21 Chestnut St.

Motorboat Manufacturers.

Isham Company.

Norwalk Launch Co.

Parts and Accessories Manufacturers.

Connecticut Gauge Co. Speed indicators.

Uncas Specialty Co.—21 Shipping St. Siren horns, spark plugs.

PLAINVILLE—

Parts and Accessories Manufacturers.

A. N. Clark & Son. Washers.

Norton & Jones Machine & Tool Works.—East Main St. Tools.

PLANTSVILLE.

Blakeslee Forging Co. Drop forging, carriage hardware.

Blakeslee Mfg. Co.. Metal trimmings.

Smith & Co.. H. D. Screw drivers, hammers, drop forgings.

PUTNAM—

Automobile Agents and Dealers.

Bugbee, B. D.—Main and Front Sts. (Pope-Hartford.)

Putnam Garage Co. (Jackson.)

Tatem & Son, J. B. (Knox.)

ROCKVILLE—

Automobile Agents and Dealers.

Roberts, David.—Talcott Ave. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Snow Hardware Co.—36 Union St. (Buick, Cadillac.)

SAYBROOK—

Garages.

Coulter, J. F.—Main St.

SAUGATUCK—

Motorboat Manufacturers.

Toquet Launch & Motor Co., The.

SEYMOUR—

Parts and Accessories Manufacturers.

Matthews Mfg. Co., H. A. Cups and cones, stampings.

Seymour Mfg. Co. Sheet and rod brass and copper.

Tingue Mfg. Co. Cloth and carpet trimmings.

SOUTHBURY—

Automobile Agents and Dealers.

Brown, H. H. (Waltham, Cadillac.)

CONNECTICUT (Continued)

SOUTHINGTON—

Parts and Accessories Manufacturers.

Atwater Mfg. Co., The.—Drop forgings.

SOUTH NORWALK—

Automobile Agents and Dealers.

Bulkley & Co., H. R. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Garages.

Robertson, E. B.—204 Washington St.

Wehrle, R. L.

Wright, L. W.

Parts and Accessories Manufacturers.

Barker Engine Co., S. Marine motors.

McKibben Mfg. Co. Spark coils, electric switches.

Specialty Mfg. Co. Electric switches.

SOUTHPORT—

Automobile Agents and Dealers.

Bulkley Automobile Station.—Sacaeco Bridge. (Lozier, Corbin.) Repairing and repairing.

Garages.

Bulkley Automobile Station.—Sacaeco Bridge. (Lozier, Corbin.) Repairing.

Repairing, Automobile.

Bulkley Automobile Station.—Sacaeco Bridge. (Lozier, Corbin.) Garage.

STAFFORD SPRINGS—

Automobile Agents and Dealers.

Brown & Pinny. (Maxwell.)

STAMFORD—

Clubs and Associations.

Automobile Club of Stamford. Dr. Dean Foster, Sec.

Automobile Agents and Dealers.

Bell, A. W. (Jackson.)

Clark's Garage.—Boston Post Road. (Winton.)

Mechaley Auto Co.—30-40 Summer St. (Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, Cadillac, White.) Supplies, garage and repairing.

Parsons, F. C.—500 Main St. (Waltham.)

West End Auto & Machine Co.—72 W. Main St. (Maxwell.)

Garages.

Mechaley Auto Co.—30-40 Summer St. (Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, Cadillac, White.) Repairing and supplies.

Motorboat Manufacturers.

Stamford Motor Co.

Parts and Accessories Manufacturers.

International Power Vehicle Co.—216 Pacific St. Kerosene motors.

Stamford Motor Co. Automobile motors.

CONNECTICUT (Continued)

Repairing, Automobile.

Mechaley Auto Co.—30-40 Summer St.
(Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, Cadillac, White.)
Supplies and garage.

Supply Houses.

Mechaley Auto Co.—30-40 Summer St.
(Haynes, Pope-Toledo, Pope-Waverley, Oldsmobile, Cadillac, White.)
Garage and repairing.

STEPHNEY—

Automobile Agents and Dealers.

Stephney Auto Supply Station. (Waltham.)

THOMPSONVILLE—

Parts and Accessories Manufacturers.

Standard Metal Work Co. Brass tubing, gas intakes, exhaust headers, metal work to specification.

TORRINGTON—

Automobile Agents and Dealers.

Clark, C. D. (Buick, Jackson.)

Parts and Accessories Manufacturers.

Coe Brass Mfg. Co. Brass and copper (sheet and iron), brass and copper tubing.

Progressive Mfg. Co., The. Spark plugs.

Standard Co. Nipples, spark plugs, wire terminals.

WALLINGFORD—

Automobile Agents and Dealers.

Pierce, A. L. (Waltham.)

WATERBURY—

Automobile Agents and Dealers.

Blanchard, E. H. (Pope-Hartford.)

Bristol Automobile Co. Platts Mills.
(Thomas Flyer, Thomas Detroit.)
Garage and repairing.

Elton Automobile Co.—156 E. Main St. (Reo, Rambler.)

Hughes, John R.—130 Bank St. (Ford.)

Mintie & Benedict.—21 Buckingham St.. (Pope-Waverley, Stevens-Duryea.)

Towle Co., E. H.—25 W. Main St. (Locomobile, Franklin, Cadillac.)
Garage, repairing, supplies.

Turrell & Co., H. M.—17-19 Jefferson St. (Rambler.)

Wilson Co., D. B.—13 E. Main St. (Maxwell.)

Youmans, John.—251 S. Main St. (Mitchell, National.)

Garages.

Bristol Automobile Co.—Platts Mills.
(Thomas Flyer, Thomas Detroit.)
Repairing.

Eckhoff, John.—Anthony St.

Maye & Lindeman.—92 Ward St.

Towle Co., E. H.—25 W. Main St. (Locomobile, Franklin, Cadillac.)
Repairs and supplies.

CONNECTICUT (Continued)

Parts and Accessories Manufacturers.

American Pin Co. Brass, bronze, aluminum and copper castings.

Benedict & Burnham. Brass and copper tubing.

Blake & Johnson. Bolts, nuts, special automobile machinery, machine works to order, screw machine products, screws.

French Mfg. Co.—Grandview Ave. and Robbins St. Brass and copper tubing.

Manufacturers' Foundry Co. Gray iron castings, machine work to order, patterns.

Noera Mfg. Co.—Lubricators, oil cans, oil guns, oil pumps, tire pumps.

Non-Corrosive Metal Co. Brass, bronze, aluminum and copper castings.

Plume & Atwood Mfg. Co. Sheet and rod brass and copper.

Randolph-Clowes Co. Sheet brass and copper, boiler and copper shells, brass and copper tubing, brass and copper metals.

Scoville Mfg. Co. Sheet and rod brass and copper, oil cans, tire valves.

Waterbury Brass Co. Sheet and rod brass and copper, brazing compound, brass and copper tubing.

Waterbury Mfg. Co. Lock nuts and washers, screws.

Waterbury Tool Co.—Tools.

Wells & Co., A. H.—Watertown Rd. Brass, copper, bronze and silver tubing.

Repairing, Automobile.

Bristol Automobile Co. Platts mills.
(Thomas Flyer, Thomas Detroit.)
Garage.

Towle Co., E. H.—25 W. Main St. (Locomobile, Franklin, Cadillac.)
Supplies and garage.

Supply Houses.

Towle Co., E. H.—25 W. Main St. (Locomobile, Franklin, Cadillac.)
Garage and repairing.

WESTBROOK—

Garages.

Wilcox, W. A.

WESTHAVEN—

Garages.

Clinton, Walter R.—34 Elm St.

WEST MYSTIC—

Motorboat Manufacturers.

Auto Boat Co.

Holmes Motor Co.

Parts and Accessories Manufacturers.

Holmes Motor Co. Gasoline marine motors.

WILLIMANTIC—

Automobile Agents and Dealers.

Asher, W. J.—Main St. (Rambler.)

CONNECTICUT (Continued)

Bartlett, Geo. A. (Columbia.)
Chesbro, Ernest P.—Main St. (Buick, Cadillac, Waltham.)
Hills Auto Station.—125 Church St. (Maxwell, Stanley, Ford.)

Garages.

Tiffany, Calvin H.
Whitmore, E. T.—750 Main St.

WILTON—

Automobile Agents and Dealers.
Hubbell, Wm. K. J. (Mora.)

WINDSOR—

Parts and Accessories Manufacturers.
Eddy Electric Mfg. Co. Electric generators, electric motors.

WINDSOR LOCKS—

Automobile Agents and Dealers.
Connecticut Motor Car Co.—Main St. (Columbia.)
Gates, Geo. W. (Pope-Waverley, Franklin.)

WINSTED—

Automobile Agents and Dealers.
Catlin, F. B. (Cadillac, second-hand cars.) Supplies.
Roscoe, Benjamin. (Maxwell.)
Parts and Accessories Manufacturers.
Franklin Moore Co. Brass, bronze, aluminum and copper castings, gray iron castings, bolts and nuts.
Goodwin & Kintz Co. Copper and asbestos gaskets.
Supply Houses.
Catlin, F. B. (Cadillac, second-hand cars.)

WOODMONT—

Garages.
Woodmont Garage & Livery.

DELAWARE

NEWARK—

Automobile Agents and Dealers.
Wright Co., H. B. (Rambler.)

WILMINGTON—

Automobile Agents and Dealers.
Bradford Co.—711 Market St. (Reo.)
Delaware Auto Storage & Repair Co.—11th and West Sts. (Pope-Waverley.)
Foss-Hughes Motor Car Co. (Cadillac.)
Howell, Dr. Harrison. (Waltham.)
Motor Car Repair Co.—408 Orange St. (Maxwell.)
Richardson, J. R.—11th and West Sts. (Rapid.)
Thurlow, J. A.—10th and Delaware Sts. (Queen.)
Vandever & Co., H. W.—887 Market St. (Pope-Hartford.)
Wilmington Auto Co.—Delaware and 10th Sts. (Autocar, Franklin, Winton.)
Garages.
Palmer, W. J.—220 W. 10th St.

DELAWARE (Continued)

Parts and Accessories Manufacturers.

Heindel Co., H. A. Gasoline marine motors.
McCullough Iron Co. Sheet iron and steel.
Diamond State Steel Co. Bar iron and steel.
Speakman Supply and Pipe Co. Brass pipe fittings.
Wilmington Malleable Iron Co. Malleable iron castings, steel castings.
Repairing, Automobile.
Jones & Shumacher.
Supply Houses.
Automobile Specialty Co.

DISTRICT OF COLUMBIA

WASHINGTON—

Clubs and Associations.

National Capitol Automobile Club.—E. M. Sutherland, Sec. 819 14th St.
Washington Automobile Dealers' Association.—B. C. Washington, Jr., Asst. Sec., 817 14th St., N. W.

Automobile Agents and Dealers.

Auburn Auto Co.—1312 Staunton Court. (Auburn.)
Cahill Automobile Co.—1318 L St. N. W. (Waltham.)
Capitol Hill Garage Co.—615 B St. S. E. (Mitchell, Rambler.) Second-hand cars; garage and repairing.
Chapin, A. A.—1st and M St. N. E. (Rapid.)
Commercial Auto & Supply Co.—1313 New York Ave. N. W. (Wayne.)
Cook & Stoddard.—22nd and P Sts. N. W. (Pierce Arrow, Franklin, White, Baker, Cadillac, Darracq.)
Dorsett Co., The L. P.—17th and U Sts. N. W. (Glide.)
Dupont Garage Co.—2020 M St. N. W. (Columbia, Rambler, Waltham, Cleveland.)
Duvall, W. S.—1319 L St., N. W. (Pullman Flyer.) Garage.
Hamilton Auto Co. (Stoddard-Dayton.)
Havens, John. (Cadillac.)
Haynes Automobile Co.—1310 Staunton Pl. (Haynes.)
Hughes & Co., Chas. C.—643 Maryland Ave. (Elmore.)
Jewel Automobile Co. (Jewel.)
Lockwood, Carl J. (Stanley.)
Luttrell Co., The.—1711 14th St. N. W. (Buick.)
Maxwell, J. B.—829 14th St. (Aerocar.)
Mitchell Garage, The.—1028 Connecticut Ave. (Mitchell.)
Miller & Bros., Chas. E.—1105 14th St. N. W. (Ford, Columbus, Reo, Premier.)

DIST. OF COLUMBIA (Continued)

Motor Car Co.—1314 New York Ave.
N. W. (Thomas Flyer, Stevens-
Duryea, Columbus, Peerless.)

National Auto Co.—1711 14th St.
(Oldsmobile, Studebaker.)

Pope Automobile Co. of Washington.
—817-819 14th St. N. W. (Pope-
Toledo, Pope-Hartford, Pope-Wav-
erley, Locomobile, Autocar.) Garage
and repairing.

Thomas, J. R.—1208 Connecticut Ave.
(Maxwell.) Garage.

Thomas & Tolman Auto Co.—1828 L
St., N. W. (Pullman.)

Union Auto Co. (Elmore.)

Wagner, H. G.—17th and U Sts. N.
W. (Winton.)

Wells, Geo. W.—1013 14th St. N. W.
(National.)

Willard Auto Station.—400 14th St.
(Dolson, Jackson.)

Automobile Manufacturers, Gasolene.
Carter Motor Car Corporation.—Mun-
sey Bldg.

Garages.

Auto Livery Co.—234 14th St. N. W.
Capitol Hill Garage Co.—615 B St.
S. E. (Mitchell, Rambler. Second-
hand cars.) Repairing.

Central Garage Co.—1310 New York
Ave. N. W.

Duval, W. S.—1319 L St., N. W.
(Pullman Flyer.)

Ledvina, D.—201 2nd St., S. E.
Pope Automobile Co. of Washington.
—817-819 14th St. N. W. (Pope-
Toledo, Pope-Hartford, Pope-Wav-
erley, Locomobile, Autocar. (Re-
pairing.

Reed Bros.—715 19th St. N. W.

Rock Creek Auto & Wagon Works.—
2613 Pennsylvania Ave. N. W.

Shore, Frank.—1211 New York Ave.
Smith & Giovannetti.—814 14th St.
N. W.

Thomas, J. R.—1208 Connecticut Ave.
(Maxwell.)

Parts and Accessories Manufacturers.

Automatic Headlight Attachment Mfg.
Co.—33rd and K Sts. N. W. Auto-
matic headlight attachment.

Wallace, W. M. Torch heaters.

Repairing, Automobile.

Capitol Hill Garage Co.—615 B. St.
S. E. (Mitchell, Rambler.) Second-
hand cars; garage.

Eschinger, E. A.—715 E. 13th St.
N. W.

Pope Automobile Co. of Washington.
—817-819 14th St. N. W. (Pope-
Toledo, Pope-Hartford, Pope-Wav-
erley, Locomobile, Autocar. (Garage.
Probey Carriage Works.—32nd and M
Sts.

Vulcanizing and Tire Repairing.

Jones & Co., Howard T.—602 E. St.

FLORIDA

DAYTONA—

Clubs and Associations.

Florida East Coast Automobile Asso-
ciations.—T. E. Fitzgerald, Sec.

Automobile Agents and Dealers.

Daytona Auto Transit Co. (Cadil-
lac.)

FT. PIERCE—

Automobile Agents and Dealers.

Fee & Steward Co. (Waltham.)

FRUITLAND—

Automobile Agents and Dealers.

Park, J. W. (Cartercar.)

GAINESVILLE—

Automobile Agents and Dealers.

Runkle, Jerry. (Waltham.)

Garages.

Gainesville Automobile Co.

JACKSONVILLE—

Clubs and Associations.

Florida Automobile Association.—Dr.
F. P. Hoover, Sec. Stockton-Budd
Bldg.

Jacksonville Automobile & Motor
Club.—Herbert P. Rice, Sec.

Automobile Agents and Dealers.

Clark's Auto Transit Co.—20 Ocean
St. (Pope-Hartford.)

Gilbert, Fred E.—37 Forsyth St.
(Maxwell, Stoddard-Dayton.)

Hutto & Co. (Buick, Cadillac, El-
more.)

Nelms, Robert.—42 W. Adams St.
(Queen.)

Oliver, S. C.—29 W. Forsyth St.
(Ford.)

Pritchett, H. E. (Franklin.)

Garages.

McDonald, J. B.

Rainis Automobile Co., The.—W.
Adams St.

Stoddard, A.—18 Main St.

Weston, H. (Duval Garage.)

KEY WEST—

Automobile Agents and Dealers.

Clayton, W. C. (Waltham.)

LEESBURG—

Automobile Agents and Dealers.

Clark, J. Y. (Cartercar.)

LIVINGSTON (Orange County)—

Automobile Agents and Dealers.

Clark, B. B. (Waltham.) Garage and
repairing.

Garages.

Clark, B. B. (Waltham.) Repair-
ing.

Repairing, Automobile.

Clark, B. B. (Waltham.) Garage.

MIAMI—

Automobile Agents and Dealers.

Miami Automobile Co.—13th St., bet.
Aves. D and E. (Locomobile, Reo.)
Garage and repairing.

FLORIDA (Continued)

Garages.

Miami Automobile Co.—13th St., bet. Aves. D and E. (Locomobile, Reo.) Repairing.

Miami Transfer Co.—11th St., bet. Aves. D and E.

Motorcycle Agents and Dealers.

Read Bicycle Co.—Ave. D, bet. 12th and 13th Sts. (Indian.)

Repairing.

Miami Automobile Co.—13th St., bet. Aves. D and E. (Locomobile, Reo.) Garage.

NEW SMYRNA—

Repairing, Automobile.
Clouser, M. E.

ORLANDO—

Automobile Agents and Dealers.

Cook Auto & Carriage Co. (Buick, Cadillac.)

ORMOND—

Automobile Agents and Dealers.

Ormond Beach Garage. (Cadillac.)
Sanborn, E. S. (Waltham.)

PENSACOLA—

Automobile Agents and Dealers.

Brooks, Leslie E. (Pope-Hartford.)

SARASOTA—

Automobile Agents and Dealers.

Matheny, Geo. H. (Waltham.)

SEABREEZE—

Garages.

Egan & Grinnell.—Daytona and Ormond Beach.

TAMPA—

Automobile Agents and Dealers.

Gulf Auto & Machine Works.—101 Franklin St. (Franklin.)

Johnson & Giles. (Buick.)

Tampa Automobile & Garage Co., The.—312 Washington St. (Mitchell.)

Tampa Cycle Co.—508 Franklin St. (Cadillac.)

Tampa Harness & Wagon Co.—1007-1009 Franklin St. (Pope-Toledo, Pope - Hartford, Pope - Waverley.) Garage.

West Coast Auto Co.—1008 Florida Ave. (Maxwell.)

Garages.

Tampa Harness & Wagon Co.—1007-1009 Franklin St. (Pope-Toledo, Pope - Hartford, Pope - Waverley.)

WEST PALM BEACH—

Automobile Agents and Dealers.

Barco, Geo. C.—Olive St. (Rambler.)
Garage and repairing.

Garages.

Barco, Geo. C.—Olive St. (Rambler.)
Repairing.

Repairing, Automobile.

Barco, Geo. C.—Olive St. (Rambler.)
Garage.

GEORGIA

ATHENS—

Motorcycle Agents and Dealers.

Bishop, W. H. (Indian.)

ATLANTA—

Automobile Agents and Dealers.

Atlanta Phonograph Co. (Waltham.)

Capital City Automobile Co.—167 Peachtree Ave. (Buick, Columbia, Cadillac, Franklin.)

Gate City Motor Car Co.—708 Empire Bldg. (Dragon.)

Field Auto Co.—103 Pryor St. (Stoddard-Dayton.)

Johnson, C. H.—55 S. Forsyth St. (Stevens-Duryea.)

McRae, F. W. (Atlas.)

Piedmont Motor Car Co.—88 N. Pryor St. (Pope-Waverley, Marmon.)

Smith Carriage Co., John M. (Reo.)

Smith, Dr. Ephraim.—103 W. Peachtree St. (Mitchell.)

Stienhauer, F. C.—56 Edgewood Ave. (Rambler.)

Todd, James B.—322 Peachtree St. (Stoddard-Dayton.) Repairing.

Wight, Ed. L. (Pope-Hartford.)

Garages.

Aldrich Auto Co.

Atlanta Auto Co.

Augusta Garage Co.—519 Broad St.

Fulton Automobile Co.—103 N. Pryor St.

Southern Auto Equipment Co.

Parts and Accessories Manufacturers.

Fisk Rubber Co.—103 N. Pryor St.
Tires.

Morgan & Wright.—49 Forsyth St.
Tires.

Pennsylvania Rubber Co.—102 N. Pryor St. Tires.

Repairing.

Todd, James B.—322 Peachtree St. (Stoddard-Dayton.)

AUGUSTA—

Automobile Agents and Dealers.

Field & Co. (Rambler, Pope-Waverley.)

Lombard Iron Works & Supply Co. (Waltham.)

Moore Edenfield Electric & Mfg. Co.—1033 Broad St. (Franklin, Cadillac.) Garage and repairing.

Garages.

Moore Edenfield Electric & Mfg. Co.—1033 Broad St. (Franklin, Cadillac.) Repairing.

Repairing.

Moore Edenfield Electric & Mfg. Co.—1033 Broad St. (Franklin, Cadillac.) Garage.

BAINBRIDGE—

Clubs and Associations.

Augusta Automobile Club. Wm. Martin, Sec.

GEORGIA (Continued)

Automobile Agents and Dealers.
Caldwell, Chas. A. (Compound.)

BRUNSWICK—

Automobile Agents and Dealers.
Olewine, B. J.—New Castle. (Pope-Hartford.)

COLUMBUS—

Automobile Agents and Dealers.
Pon & Whatley Co. (Buick, Cadillac.)
Jordan, R. C. (Mitchell.)
Garages.
Ross, R. L.—12th St. and 3d Ave.
Weathers, J. F.

FITZGERALD—

Automobile Agents and Dealers.
Polhill, John H. (Pope-Hartford.)
Garages.
Johns & Armatrout.

GRIFFIN—

Automobile Agents and Dealers.
Mangham, John W.—Care of Spalding Cotton Mills. (Maxwell.)

MACON—

Clubs and Associations.
Macon Automobile Club.—H. J. Lamar, Jr., Sec.
Automobile Agents and Dealers.
Automobile & Machinery Co.—221 2d St. (Buick, Pope-Waverley, Autocar, Oldsmobile, Pope-Toledo.)
Napier, Geo. R. (Maxwell.)
Putzel, Morris. (Ford.)
Shinholser & Co., J. W.—217 3rd St. (Franklin, Cadillac.)

MARIETTA—

Automobile Agents and Dealers.
Freyer, Chas. H. (Reo.)

SAVANNAH—

Automobile Agents and Dealers.
Bryson, T. A.—14 Perry St. E. (Franklin, Cadillac, Columbia.) Garage and repairing.
Connerat, R. V.—18 E. State St. (Stevens-Duryea, Baker, Autocar.)
Electric Automobile Co., The.—14 Bryan St., W. (Columbus.)
Electric Supply Co.—309 Bull St. (Ford, Queen, Pope-Waverley.)
Kramer & Wroten.—St. Julian St. W. (Studebaker.)
Thompson & Co.—State and Whitaker Sts. (Maxwell, Reo, Rambler.)
Wilson's Garage. (Pope-Hartford, Pope-Toledo.)
Garages.
Beresford, H. A.—444 Drayton St.
Bryson, T. A.—14 Perry St. E. (Franklin, Cadillac, Columbia.) Repairing.
McIntyre & Bros., E. L.—114 Jefferson St.
Savannah Auto Brokers.—12 Bull St.
Wilson's Garage. (Pope-Hartford, Pope-Toledo.)
Repairing.

GEORGIA (Continued)

Automobile Hack Co.—115 State St. W.
Bryson, T. A.—14 Perry St. E. (Franklin, Cadillac, Columbia.) Garage.
Cook & Spring.—440 Drayton St.
Leiding, H. T.—115 State St., W.

THOMASVILLE—

Automobile Agents and Dealers.
Miller, William. (Holsman.)
Thomasville Iron Works.—331 Jackson St. (Reo, Ford.)

HAWAIIAN ISLANDS

HONOLULU—

Automobile Agents and Dealers.
Hall & Son, E. O. (Cadillac, Pope-Hartford, Franklin.)
Hayes & Dam. (Frayser-Miller.)
Hobron, T. W. (Wayne.) Garage.
Patten, W. N. (Waltham.)
Schuman Carriage Co. (Ford.)
Von Hamm Young Co.—King and Bishop Sts. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, White, Autocar, Maxwell, Buick, Stoddard-Dayton.) Garage and repairing.
Garages.
Hobron, T. W. (Wayne.)
Von Hamm Young Co.—King and Bishop Sts. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, White, Autocar, Maxwell, Buick, Stoddard-Dayton.) Garage.
Repairing, Automobile.
Von Hamm Young Co.—King and Bishop Sts. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, White, Autocar, Maxwell, Buick, Stoddard-Dayton.) Repairing.

IDAHO

BOISE—

Automobile Agents and Dealers.
Randall, A. G.—109 N. 11th St. (Buick, Waltham.) Garage and repairing.
Garages.
Randall, A. G.—109 N. 11th St. (Buick, Waltham.) Repairing.
Repairing.
Randall, A. G.—109 N. 11th St. (Buick, Waltham.) Garage.

LOUISTON—

Automobile Agents and Dealers.
Mourse, F. R. (Holsman.)

ILLINOIS

ALGONQUIN—

Repairing.
Peters Bros.—Main St.

ALTON—

Automobile Agents and Dealers.
Winter-Darnell Auto Co.—3rd and Market Sts. (Jackson.)

ILLINOIS (Continued)

Parts and Accessories Manufacturers.
Sparks Machine Co. Marine motors.

AURORA—

Clubs and Associations.

Aurora Auto Club.—W. I. Ferris, Pres.

Automobile Agents and Dealers.

Anderson Automobile Co.—41-43

Downer Pl. (Rambler, White).

Garage, repairing and supplies.

Brunmeyer, L. H.—12 S. La Salle St.
(Premier, Reo.)

Britz, J. N.—148 La Salle St. (Model.)

Welch, Andrew. (Cadillac.)

Garages.

Anderson Automobile Co.—41-43

Downer Pl. (Rambler, White.)

Repairs and supplies.

Reid, W. J.—52 S. La Salle St.

Motorcycle Manufacturers.

Aurora Automatic Machinery Co.—421
Claim St.

Parts and Accessories Manufacturers.

Aurora Automatic Machinery Co.—
421 Claim St. Carbureters, oil cups,
motorcycle motors.

Repairing.

Anderson Automobile Co.—41-43

Downer Pl. (Rambler, White.)

Supplies and garage.

Supply Houses.

Anderson Automobile Co.—41-43

Downer Pl. (Rambler, White.)

Garage and repairs.

BELLEVILLE—

Clubs and Associations.

Southern Automobile and Cycle Club.

Automobile Agents and Dealers.

Procasky, Chas.—411 Main St. (Dor-
ris, Rambler.)

BELVIDERE—

Garages.

Wyldo & McInnis.

Parts and Accessories Manufacturers.

National Sewing Machine Co. Bolts
and nuts, lubricators, screws,
washers.

Repairing, Automobile.

Bug Thunder Mfg. Co.

BLOOMINGTON—

Clubs and Associations.

Bloomington Automobile Club.—
Henry Throbo, Sec.

Automobile Agents and Dealers.

Iseminger, Floyd G.—311 E. Front St.
(Ford, Mitchell.)

Keiser-Van Leer Co., The.—505-507 N.
East St. (Rambler. Garage, repair-
ing and supplies.

Murray, J. L.—215 S. Main St. (Cad-
illac.)

Pingrey, C. H.—Eddy Bldg. (Reo.)

Garages.

Bloomington Automobile Garage.—
315 E. Front St.

Carlton, Guy.—528 N. Main St.

ILLINOIS (Continued)

Carnahan, A. G.—Monroe and Madison
Sts.

Keiser-Van Leer Co., The.—505-507 N.
East St. (Rambler.) Repairing and
supplies.

Automobile Manufacturers, Gasolene.

Fish Automobile Co.

Repairing, Automobile.

East St. (Rambler.) Supplies and

East. (Rambler.) Supplies and
garage.

Supply Houses.

Keiser-Van Leer Co., The.—505-507 N.
East St. (Rambler. (Garage and re-
pairing.

Vulcanizing and Tire Repairing.

Samuels, A. L.

BLUE ISLAND—

Parts and Accessories Manufacturers.

Bronson & Davis.—463 Fairmount
Ave. Charging Apparatus.

CAIRO—

Automobile Agents and Dealers.

McDaniel, Leo. (Premier.)

Garages.

Denison, L. E.

CAMBRIDGE—

Automobile Agents and Dealers.

Johnson, P. A. (Rapid, Glide.)

CANTON—

Automobile Agents and Dealers.

Champ Duval Co. (Buick.)

McClatchey, Meade.—71 E. Side Sq.
(Rapid.)

CHAMPAIGN—

Automobile Agents and Dealers.

Brown, J. Addison. (Peerless.)

Champaign Automobile Co. (Reo,
Premier.) Garage and repairing.

Garages.

Champaign Automobile Co. (Reo,
Premier.) Repairs.

Repairing.

Champaign Automobile Co. (Reo,
Premier.) Garage.

Miller, W. H.—Walnut St.

CHICAGO—

Clubs and Associations.

Automobile Club of Illinois.—M. S.
Scott, Sec. 407 Monadnock Block.

Chicago Automobile Club.—Sidney S.
Gorham, Sec. Plymouth Place.

Chicago Motor Club.—C. G. Green-
burg, Sec. 200 S. Clinton St.

Chicago Tire Club.—Geo. E. Shugart,
Sec. 81 Michigan Ave.

Chicago Trade Association.

Illinois State Automobile Association.

Women's Motor Club of Chicago.

Automobile Agents and Dealers.

Adams & Engs.—1712 Michigan Ave.
(Frayer-Miller, Earl.)

Adland Motor Co.—900-902 Madison
St. (Lambert.)

ILLINOIS—Chicago (Continued).
 Albaugh Bros., Dover & Co.—Marshall Boulevard and 21st St. (Sterling Star.)
 Ashland Auto Garage.—87 Ashland Boulevard. (Auburn, Meiselbach.)
 Banker Co., A. C.—35th St. and Grand Blvd. (Logan, Compound.)
 Banta, A. J.—1354 Michigan Ave. (Locomobile.)
 Bayliss, Jos. E.—1218 Michigan Ave. (Elmore.)
 Bird-Sykes Co.—1470 Michigan Ave. (Corbin, Middle West Distributors.) Garage and repairing.
 Branstetter Motor Co., The.—1337 Michigan Ave. (Dragon, Moon.)
 Buick Motor Co.—1412 Michigan Ave. (Buick.)
 Cadillac Automobile Co. of Illinois.—1312 Michigan Ave. (Cadillac.)
 Central Auto Co.—Cor. Jackson Blvd. and Franklin St. (2nd hand cars.) Garage and repairing.
 Chicago Auto Garage Co.—3210 N. Clark St. (Reo, Premier, Columbus.)
 Chicago Motor Car Co.—1615 Michigan Ave. (Packard.)
 Chicago Vulcanizing Co. (Northern.)
 Cleveland Motor Car Co.—1470 Michigan Ave. (Cleveland.) Repairing.
 Coey & Co., C. A.—1424-26 Michigan Ave. (Thomas Flyer, Thomas Detroit.) Garage.
 Cook & Co., R. W.—1253 Michigan Ave. (Royal.)
 Cornish-Friedberg Motor Car Co.—1233 Michigan Ave. (Aerocar, Gale, C. F.)
 Darracq Motor Car Co.—1502 Michigan Ave. (Darracq.)
 De Haven Bros.—87 S. Center Ave. (De Haven.)
 Dragon Auto Co.—1337 Michigan Ave. (Dragon.)
 Duffield, Maus & Co.—347-349 Wabash Ave. (Logan.)
 Edgewater Garage.—Evanston Ave. and Winona St. (Buick.)
 Electric Vehicle Co.—1332 Michigan Ave. (Columbia.)
 Fay, Owen H.—243 Michigan Boulevard. (Elmore.)
 Ford Motor Co.—1444 Michigan Ave. (Ford.)
 Franco-American Auto Supply Co.—(Clement-Bayard.)
 Franklin Automobile Co.—1450 Michigan Ave. (Franklin.)
 Garfield Park Automobile Garage.—1891 W. Harrison St. (Lambert.)
 Githens Bros. Co.—1328 Michigan Ave. Oldsmobile, Stearns.) Repairing.
 Greer Motor Car Co.—60-68 W. Van Buren St. (Pungs-Finch.) Garage and repairing.
 Griffin & Kilmer. (Smith.)

ILLINOIS—Chicago (Continued).
 Gunther Co., Jos. F.—1240 Michigan Ave. (Apperson.)
 Hagmann & Hammerly.—1305 Michigan Ave. (Jewel, Deere, Cartercar.)
 Hamilton Automobile Co.—1251 Michigan Ave. (Chadwick.)
 Holmes & Co., G. E.—1502 Michigan Ave. (Welch, Queen.)
 Illsley, Inc., Frank P.—1329 Michigan Ave. (Stevens-Duryea.)
 Jaeger, Chas. P.—1305 Michigan Ave. (York Pullman.)
 Jeffery & Co., Thos. B.—302-304 Wabash Ave. (Rambler.)
 Jones, H. M.—1329 Michigan Ave. (American Mercedes.)
 Kline Co., The.—1610 Michigan Ave. (English and American Napier.)
 Knox Auto Co. of Illinois.—1208 Michigan Ave. (Knox.) Repairing.
 Levy & Fanning.—390 Wabash Ave. (Autocar, Lozier.)
 Lindineier, P. F.—1164 W. Lake St. (Glide.)
 Locomobile Co. of America, The.—1354 Michigan Ave. (Locomobile.)
 Manhattan Motor Car Co.—1329 Michigan Ave. (Acme.)
 Maxwell-Briscoe-Chase Co.—1407-1409 Michigan Ave. (Maxwell, Columbus.) Garage and repairing.
 McDuffee Automobile Co., The.—1501 Michigan Ave. (De Luxe, Stoddard-Dayton, Kissel Kar.)
 Mercedes Import Co.—1449 Michigan Ave. (Mercedes.)
 Mitchell Auto Co.—1466 Michigan Ave. (Mitchell.)
 Moore & Babcock.—429 Wabash Ave. (Reliance.)
 Mora Motor Car Co.—1218 Michigan Ave. (Mora.)
 Northern Auto Co.—1447 Michigan Ave. (Peerless.)
 Oldsmobile Co.—1328 Michigan Ave. (Oldsmobile.)
 Owen & Co., R. M.—1344 Michigan Ave. (Reo, Premier.)
 Pardee & Canary, Inc.—1218 Michigan Ave. (American Mors, Renault, Mora, American.)
 Paulman & Co., H.—1428 Michigan Ave. (Pierce-Arrow.)
 Pierce Engine Co.—1421 Michigan Ave. (Pierce-Racine.)
 Pierce & Isbell.—1413 Michigan Ave. Baker.)
 Pullman Motor & Vehicle Co.—Fisher Bldg. (Model.)
 Pullman Motor Car Co.—(Pullman Flyer.)
 Rainier Motor Car Co., The.—1725 Michigan Ave. (Rainier.)

ILLINOIS—Chicago (Continued).
 Richter, Robt. H.—1421 Michigan Ave. (Hotchkiss.)
 Schmidt, A. G.—1404 Michigan Ave. (Clement-Bayard.)
 Sears & Burgess.—1229 Michigan Ave. (Pullman Flyer.)
 Shaw Co., The Walden W.—1532 Michigan Ave. (Wayne, Berliet.)
 Studebaker Bros. Mfg. Co.—378 Wabash Ave. (Studebaker.)
 Temple Auto Co., Ralph.—1219-21 Michigan Ave. (National, Jackson, Pullman, Temple, Marvel.)
 Tennant Motor, Ltd.—1449 Michigan Ave. (Peerless, Mercedes.)
 Waltham Motor Car Co.—443 Wabash Ave. (Waltham.)
 Warner & Co., C. P.—1502 Michigan Ave. (Moline.)
 Weber Co., Orlando F.—1322 Michigan Ave. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
 Wentworth Garage.—6346 Wentworth Ave. (Cartercar.)
 Western Motor Car Co.—1412-1414 Michigan Ave. (Stearns.)
 White Co., The.—240 Michigan Ave. (White.)
 White Mfg. Co. (Brazier.)
 Winton Motor Carriage Co.—1259 Michigan Ave. (Winton.)
 Woods Motor Vehicle Co.—1408 Michigan Ave. (Woods.)
Automobile Manufacturers, Electric.
 Woods Motor Vehicle Co.—1408 Michigan Ave. Factories, 2515-2521 Calumet Ave. and 2510-2520 Cottage Grove Ave.
Automobile Manufacturers, Gasolene.
 Automobile Parts and Equipments Co.
 Ben Hur Motor Co., The.—120 Randolph St.
 Chicago Coach & Carriage Co.
 Commercial Automobile Co.—1353 Garfield Bldg.
 Continental Motor Car Co.—20th St. and West End Ave.
 Cornish-Friedberg Motor Car Co.
 Diamond T. Motor Car Co.
 Duplex Automobile Works.—4212 State St.
 Knight & Kilbourn.—1240 Michigan Ave.
 Kupel Co., H. L.—912 Tacoma Bldg.
 Lorraine Automobile Mfg. Co.—1812 22nd St.
 Pullman Motor Car Co.
 Reliable Dayton Motor Car Co.—375 W. Lake St.
 Staver Carriage Co., The.—76th and Wallace Sts.
 Western Auto Parts Co.—107 Dearborn St.

ILLINOIS—Chicago (Continued).
 Western Engine Works, The.—Austin.
 Woods Motor Vehicle Co.—1408 Michigan Ave.; factories, 2515-21 Calumet Ave. and 2510-2520 Cottage Grove Ave.
Automobile Manufacturers, Gasolene, Commercial.
 Monarch Motor Car Co.—Monadnock Bldg.
 Chicago Commercial Auto Mfg. Co.
 Gifford-Pettit Mfg. Co.—1217 Devon Ave.
Garages.
 Adland Motor Co.—900 W. Madison St.
 Armac Motor Co.—472 Carrol Ave.
 Ashland Auto Garage.—87-89 Ashland Blvd.
 Auto Maintenance Co.—205 W. Jackson Blvd.
 Automobile Exchange, The.—1545 Michigan Ave.
 Automobile Palace.—152 W. Jackson Blvd.
 Automobile Parts and Equipment Co.—2224-34 Michigan Ave.
 Baker Electric Vehicle Co. of Chicago.
 Becker, Louis.—1717 Deming Pl.
 Binford's Auto Station.—1287-1289 W. Lake St. Repairing.
 Bird-Sykes Co.—1470 Michigan Ave. (Corbin Middle-West distributors.) Repairing.
 Blue Auto Co.—209 S. Paulina St.
 Boulevard Auto Garage.—204 Lincoln Park Blvd.
 Brignall, Geo.—5110 Calumet Ave.
 Calumet Auto Co.—116 E. 29th St.
 Calumet Auto Garage.—4927 Prairie Ave.
 Campbell, James.—455 Jackson Blvd.
 Carpenter & Volkhardt.—2559 Indiana Ave.
 Catelein, Andre G.—1446 Indiana Ave.
 Central Auto Co.—Cor. Jackson Blvd. and Franklin St. (2nd hand cars.) Repairing.
 Chicago Automobile Garage Co.—3210 N. Clark St.
 Christopher Bros.—1049 Sheffield Ave.
 Clarendon Auto Station.—2091 Clarendon Ave.
 Clark, John.—1005 Park Ave.
 Coey, & Co., C. A.—1424-1426 Michigan Ave. (Thomas Flyer, Thomas Detroit.)
 Colonial Auto Garage.—50-52 E. 39th St.
 Commission Auto Co.—1602 Michigan Ave.
 Cranston & Co., T. H.—58 Wabash Ave.
 Dart Mfg. Co.—524 Sheffield Ave.
 De Haven Bros.—87 S. Center Ave.
 Devlin & Co.—1407 Michigan Ave.

ILLINOIS—Chicago (Continued).

Dominick, Wm.—542-544 Wabash Ave.
 Edgewater Garage.—2288-2290 Evans-
 ton Ave.
 Edstrom, A.—1474 W. Madison St.
 Englewood Auto Livery.—639 W. 63rd
 St.
 Excelsior Auto Repair Station.—3925
 Michigan Ave.
 Fashion Auto Station.—4612 Cottage
 Grove St.
 53rd St. Auto Co.—87 E. 53rd St.
 Garfield Automobile Co.—1199 Gar-
 field Blvd.
 Graham Automobile Co.—601-605 W.
 Madison St.
 Grand Auto Station.—204 E. 35th St.
 Graves, J. H.—836 W. Division St.
 Greenwood Auto Garage.—197 E. 47th
 St.
 Greer, Erwin.—1446 Indiana Ave.
 Greer Motor Car Co.—60-68 W. Van
 Buren St. (Pungs-Finch.) Repair-
 ing.
 Gross Terrace Garage.—Rear 1396
 Madison St. Repairing, supplies.
 Hagmann & Hammerly.—Harrison
 and Oakley Sts.
 Harding, Geo. S.—1401 Michigan Ave.
 Hartigan, F. L.—5206 Lake Ave.
 Hazel Garage, The.—954 Garfield
 Blvd.
 Hemwell, John.—2279 Washington
 Blvd.
 Hoff, Albert.—15 Germania St.
 Humboldt, Geo. E.—1246 Argyle Ave.
 Hyde Park Garage.—5208 Lake Ave.
 Hyde Park Hotel Garage.—5120 Lake
 Ave.
 Isbell, Wm. G. & Co.—1413 Michigan
 Ave.
 Jackson Park Auto Garage.—6430
 Jackson Park.
 Kenwood Auto Station.—5035 Cottage
 Grove Ave.
 Kupel & Co., H. L.—4515 Ellis Ave.
 Lake Shore Auto Station.—520 Dear-
 born Ave.
 Lake View Auto Station.—55 Evans-
 ton Ave.
 Langstaff Machine Works.—65 Maple
 St.
 Lederer, Simeon.—4711 Forestville St.
 Lincoln Park Auto Co.—1071 (rear) N.
 Clark St.
 Lipsey & Co., H. H.—3843 Grand
 Blvd.
 McGaughy, H. G.—1345 Wabash Ave.
 Maxwell-Briscoe-Chase Co.—1407-1409
 Michigan Ave. (Maxwell, Colum-
 bus.) Repairing.
 Miller, B.—4036 Prairie Ave.
 Model Garage Co., The.—645 E. 47th
 St.
 Monson Auto Co.—57 Maple St.
 Motley Auto Livery, C. W.—349 Mich-
 igan Ave.

ILLINOIS—Chicago (Continued).

North Division Auto Co.—385 E. Su-
 perior St.
 North Side Auto Station.—446 North
 Clark St.
 Nyberg Automobile Works.—30th St.
 and Michigan Ave. Repairing.
 Oakenwald Garage.—35 E. 46th St.
 Park Auto Co.—893 E. 51st St.
 Pearson Garage.—4-10 Pearson St.
 Pioneer Auto Livery.—1446 Indiana
 Ave.
 Rambler Garage.—1218 Sheridan Rd.
 Reliable Repair Co.—1607 Michigan
 Ave.
 Reynolds Motor Works.—3149 Wa-
 bash Ave.
 St. Louis Auto Station.—465 Colorado
 Ave.
 Savell, J. E.—204 35th St.
 Shaw Co., Waldon W.—1532 Michigan
 Ave.
 Shendoah Auto Garage.—1610 Briar
 Pl.
 Sheridan Auto Station.—3210 N. Clark
 St.
 Sheridan Garage, The.—3096 N. Clark
 St.
 Sieber, H.—949 W. Van Buren St.
 South Park Auto Co.—312-316 E. 57th
 St.
 South Side Auto Repository.—769 44th
 St.
 South Side Auto Station.—323 E. 35th
 St.
 Star Auto Garage.—2253 Cottage
 Grove Ave.
 Steward & Kennedy.—5208-5212 Lake
 Ave.
 Stoddard-Dayton Garage.—3959 Grand
 Blvd.
 31st St. Garage.—316 31st St.
 Towle, A. N.—540 Wabash Ave.
 Walton Auto Garage.—285 N. Clark St.
 Washington Automobile Co.—1068
 Washington Blvd.
 Washington Auto Station.—5031 Cot-
 tage Grove Ave.
 Weed, U. S.—Ontario St.
 Wentworth Garage.—6346 Wentworth
 Ave.
 White Garage, The.—240 Michigan
 Ave.
 Wolf Pederson Automobile & Machine
 Co.—1219 Devon Ave.
 Woodland Auto Garage.—6430 Jackson
 Park Ave.
 Woodlawn Auto Station.—6310 Wood-
 lawn Ave.
Insurance, Automobile.
 James & Co., Fred S.—171 La Salle St.
 Automobile fire, theft, transportation
 and collision insurance.
 Moore, Case, Lyman & Herrick.—159
 La Salle St., Chicago branch of
 Boston Insurance Co., Boston, Mass.
 Insure against fire and theft.

ILLINOIS—Chicago (Continued).

Strauss, Sig. L.—159 La Salle St. General insurance agency, fire, theft, collision, personal injury and liability.

Motorboat Manufacturers.

Fairbanks, Morse & Co.

Outing Boat Co.—Marquette Bldg.

Motorcycle Agents and Dealers.

Brandenburg & Co.—Selling Agents, 85 Lake St. (Thor.)

Whipple, "The Motorcycle Man."—260 W. Jackson Blvd. (Indian, Merkel.)

Motorcycle Manufacturers.

Armec Motor Co.—472-478 Carroll Ave.

Excelsior Motor & Mfg. Co.—233-35-37 Randolph St.

Fowler-Manson-Sherman Cycle Mfg. Co.—45-47 Fulton St.

Hoffman Launch & Motor Works, W.—1233 N. Halsted St.

Illinois Motor Works.—719-723 Sheffield Ave.

Pope Mfg. Co.—907 Rector Bldg.

***Parts and Accessories Manufacturers.**

A. & J. Mfg. Co.—26 W. Randolph St. Crank hangers, brackets for motorcycles, brazing compounds.

Abel Mfg. Co.—1112 Great Northern Bldg. Lamps.

Acme Oil & Supply Co.—345 S. Canal St. Grease, oils, auto body soaps.

Acorn Brass Mfg. Co.—56 S. Peoria St. Timers, priming cups, carbureters.

Adams & Elting Co.—155 W. Washington St. Enamel, paints, auto body polishes, metal polishes, varnishes.

Adapt Machinery Co., The.—17th St. and Wabash Ave. Glass wind shields, bumpers, gears, lubricators, springs, trunk racks, chain tools, repairing.

Ajax-Grieb Rubber Co.—1303 Michigan Ave. Tires.

Alexander & Co.—72 W. Monroe St. Marine and automobile motors, reverse gears, fittings.

Allen Mfg. Co., W. D.—151 Lake St. Brass, bronze, aluminum and copper castings, tire cases.

American Battery Co.—170-172 S. Clinton St. Storage batteries.

American Glove Co., The.—18 Churchill St. Gloves and gauntlets.

American Motor Parts Co.—21-25 Plymouth Court. Carbureters, exhaust horns, lamp brackets, oil cups, oil guns, glass wind shields, tire holders, mufflers, cut-out valves, gasoline strainers.

American Steel & Wire Co.—The Rookery. Sheet iron and steel, machinery springs, steel shafting, insulated wire.

ILLINOIS—Chicago (Continued).

Appliance Mfg. Co.—72-86 W. Jackson Blvd. Bumpers, horns, foot rests, robe rails, tire holders.

Armec Motor Co.—472-78 Carroll Ave. Gasoline automobile motors.

Armour & Co. Curled hair.

Armstrong Bros. Tool Co.—104-124 N. Francisco Ave. Tools.

Artizan Brass Co.—204 Lincoln Park Blvd. Tire pumps, safety valves.

Atchison Perforating Co.—303 Dearborn St. Perforated metals.

Auto Equipment Co., The.—1424-1446 Michigan Ave. Wood and metallic bodies, auto tops, glass wind shields.

Auto Lock Co.—6546 Minerva Ave. Electric lock switches.

Auto Specialty Co.—63 E. Madison St. Timers, ammeters, voltmeters, volt-ammeters, storage and primary batteries, spark coils.

Automobile Specialty Co.—509 Wiloughby Bldg. Valve lifters.

Automobile Supply Co., The.—1339 Michigan Ave. Horns, hydrometers, jacks, auto body and hand soaps.

B. & J. Mfg. Co.—3985 Cottage Grove Ave. Spark plugs, electric switches.

Bastian Mfg. Co., Chas. L.—76 Illinois St. Brass, bronze, aluminum and copper castings.

Bell, D. M.—Franklin and Michigan Sts. Tire pumps.

Bendix Co., The.—2107 N. 9th St. Chassis, transmission gears, gasoline automobile motors.

Ben Hur Motor Co.—120 Randolph St. Lubricators, automobile motors.

Benjamin Electric Mfg. Co.—42 W. Jackson Blvd. Charging plugs.

Besly & Co., C. H.—15-21 S. Clinton St. Disc grinders, spiral circles, tops, machine tools, oil, brass and copper.

Bicycle Step Ladder Co., The.—63 Randolph St. Jacks, turntables and pits.

Brock, A. A.—140 Dearborn St., Carbureters.

Buda Fdry & Mfg. Co. Jacks.

Carroll, J. B.—90-92 Illinois St. Gas lamp burners.

Cassady Fairbank Mfg. Co.—6106-6130 La Salle St. Gears, covers, cups, hardening, stamping, plating, contract work.

Champion Oil Co.—39th St. and Lowe Ave. Oils.

Channon & Co., H.—Market and Randolph Sts. Auto covers, tire repair kits.

Charter & Co.—303 Dearborn St. Spark plugs, storage batteries, mechanical oilers.

Chicago Art Metal Works.—67 Lake St. Name plates.

ILLINOIS—Chicago (Continued).

Chicago Auto Heater Co.—285 State St. Auto heaters.
 Chicago Auto Lamp Works.—71 W. Jackson Blvd. Acetylene generators and lamps.
 Chicago Auto Robe Supply Co.—159 Market St. Miscellaneous wearing apparel, auto robes, coats, gloves gauntlets, rugs.
 Chicago Battery Co.—Michigan Ave. and 14th St. Annunciators and storage batteries.
 Chicago Caloric Engine Co. Marine motors.
 Chicago Carriage & Trimming Co.—1908 Indiana Ave. Auto tops.
 Chicago Coach & Carriage Co.—1223 Michigan Ave. Wood and metallic bodies, auto tops and glass wind shields.
 Chicago Eye Shield Co.—143-147 South Clinton St. Eye protectors, eye shields and goggles.
 Chicago Flexible Shaft Co.—La Salle Ave. and Ontario St. Auto heaters.
 Chicago Insulated Wire & Mfg Co., The.—152-154 Lake St. Insulated electric wire.
 Chicago Pneumatic Tool Co.—1010 Fisher Bldg. Air compressors, special automobile machinery, buffing machines, flexible drilling machines, and tools.
 Chicago Portable House Co.—4726 Shields Ave. Portable houses.
 Chicago Rawhide Mfg. Co.—75-77 Ohio St. Belting, rawhide gear wheels, packing, tire sleeves.
 Chicago Screw Co.—2 N. Canal St. Bolts, nuts, cups, cones, screw machine products.
 Chicago Varnish Co.—Dearborn Ave. and Henzie St. Varnishes.
 Childs & Co., S. D.—200 S. Clark St. License numbers, monograms, name plates.
 Christopher Bros.—1049 Sheffield Ave. Carbureters.
 Churchill Cabinet Co.—72 Churchill St. Spark coils, dash coils and battery boxes.
 Collinson, M.—1253 Michigan Ave. Auto tops.
 Commercial Battery Co.—204-206 Michigan St. Igniters, storage batteries.
 Commercial Storage Battery Co.—147 W. Jackson Blvd. Storage batteries.
 Consolidated Rubber Tire Co.—435 Wabash Ave. Tires.
 Crane & Co.—519 S. Canal St. Brass pipe fittings, wrought iron and steel pipe.
 Crouch & Co., Chas. P.—484 Carroll Ave. Automobile and marine motors.

ILLINOIS—Chicago (Continued).

Crowe Metal Mfg. Co.—71 W. Jackson Blvd. Name plates.
 Cullman Wheel Co.—1030 Dunning St. Chains, differential gears, sprockets.
 Curtain Supply Co.—85-93 Ohio St. Auto tops and curtains.
 Dallas, A. C.—36 La Salle St. Brass and copper tubing.
 Davis Robe Co., Inc.—1307 Champlain Bldg. Auto robes, miscellaneous wearing apparel.
 Dearborn Drug & Chemical Works. Oils.
 Diamond Rubber Co.—1523-31 Michigan Ave. Tires.
 Double-Friction Coil Clutch Co.—45 Canal St. Clutches.
 Eaton & Prince.—76 Michigan St. Elevators for garages.
 Economy Oil & Compound Co.—442 Clark St. Grease, oils.
 Eisendrath Glove Co.—Armitage and Elston Ave. Gloves and gauntlets.
 Elevator Supply & Repair Co.—76 W. Monroe St. Lubricators.
 Empire Automobile Tire Co.—20 La Salle St. and 1615 Wabash Ave. Tires.
 Fairbanks, Morse & Co.—Franklin and Monroe Sts. Marine motors.
 Fairchild & Bros., M. H.—119 Michigan St. Metal polishes and automobile body soaps.
 Firestone Tire & Rubber Co.—1442 Michigan Ave. Tires.
 Fisk Rubber Co.—1440 Michigan Ave. Tires.
 Fluke, F. S.—6036 Woodlawn Ave. Lock nuts and washers.
 Flurkey Carriage & Trimming Co.—566 Wabash Ave. Automobile tops.
 Foot Bros. Gear & Machine Co.—24 S. Clinton St. Transmission gears.
 Garden City Spring Works.—2000 Purple St. Leaf springs.
 Gardiner Metal Co.—454-456 Lake St. Babbitt metal, solder.
 Geen Electrical Mfg. Co., Inc.—180 Lake St. Dry batteries, spark coils, spark plugs, timers, volt and ammeters, wire battery connector, carbureters.
 Gibson Co., Wm. D.—Huron and Kingsbury Sts. Springs, gas engines, automobile machinery.
 Goldberg Motor Car Devices Mfg Co.—1253 Michigan Ave. Carbureters.
 Goldsmith Bros. Smelting & Refining Works.—63-65 Washington St. Platinum.
 Goodrich Co., B. F.—24 E. Lake St. Tires.
 Goodyear Tire & Rubber Co.—80-82 Michigan Ave. Tires.
 Granger's Drop Forge Works. Drop forgings, gear blanks, wrenches.

ILLINOIS—Chicago (Continued).

Guillott Metal Gasket Co.—97 S. Clinton St. Gaskets.
 Hammar Mfg. Co., H.—170 E. Madison St. Mufflers.
 Hanson, C. H.—44 Clarke St. Auto license plates.
 Harrington & King Perforating Co.—N. Union St. Perforated metals.
 Haschke Compound Storage Battery Co.—89 Ashland Blvd. Storage batteries.
 Haskell Bros.—Washington and Wabash Aves. Auto trunks.
 Hassler Co., Owen C.—1543 Milwaukee Ave. Metal polishes.
 Henion & Hubbell.—69 N. Jefferson St. Fuel and air pumps.
 Hensel Battery & Mfg. Co.—Michigan Ave. and Eldredge Court. Storage batteries.
 Herbert, W. H.—3312 Wabash Ave. Spark plugs, timers.
 Hercules Auto Specialty Mfg. Co.—115 Dearborn St. Shock absorbers, auto specialties.
 Hine Watt Mfg. Co.—60 Wabash Ave. Acetylene generators, lamps.
 Hoffman Launch & Motor Works.—1253 N. Halstead St. Gasolene marine motors.
 Holliday Mfg. & Engineering Co.—160 Bunker St. Marine motors, marine reverse gears.
 Illinois Malleable Iron Co.—Malleable iron castings, pipe and brass fittings.
 Imperial Brass Mfg. Co.—251 S. Jefferson St. Spark plugs and ignition devices.
 Independent Steel & Wire Co.—House St. Machinery springs, seat springs.
 Indestructible Steel Wheel Co.—1303 Michigan Ave. Sheet steel, stampings, steel wheels.
 India Rubber Tire Co.—477 Wabash Ave. Bow separators.
 "It" Locknut Concern.—515 E. 63rd St. Lock nuts and washers.
 Jackson Tire Filling & Refilling Co.—190 W. Jackson Blvd. Tire fluid.
 Johnson, A. D.—1446 Wabash Ave. Automobile tops.
 Jones, Wm. S.—1303 Michigan Ave. Gasolene strainers.
 Kaltenbach, Fred.—12 N. Jefferson St. Storage tanks.
 Karr Portable House Co.—605 Bell-plaine Ave. Portable houses.
 Kelley, Maus & Co.—1-5 West Lake St. Metal trimmings.
 Kimball & Co., C. P.—315-318 Michigan Ave. Bodies.
 King Optical Co., Julius.—State and Madison Sts. Goggles.
 Kirk & Co.—360 Water St. Soap.
 Knight & Co., H. C.—1725 Michigan Ave. Folding glass fronts.

ILLINOIS—Chicago (Continued).

Krembs & Co.—55 Waldo Pl. Brazing compound, drill compound.
 Lauth & Co., J.—528 Elston Ave. Transmission gears.
 Liberty Association.—12-14 State St. Fire extinguishers, linseed oil soap, metal polish.
 Limousine & Carriage Mfg. Co.—35th St. and Michigan Ave. Wood and metallic bodies, bow sockets, automobile tops, glass wind shields.
 Link Belt Co.—Chains, turn tables.
 London Auto Supply Co.—1229-1231 Michigan Ave. Tops, glass fronts.
 Long Mfg. Co.—1430-34 Michigan Ave. Dashes and fenders, hoods, radiators, brass and copper tubing.
 Lustre Chemical Co.—1303 Michigan Ave. Carbureters.
 Magie Bros.—9-11 N. Canal St. Grease, oils, automobile body polishes.
 Manlove Gate Co.—272 E. Huron St. Driveway gates.
 Martin & Anson Co.—2226 Indiana Ave. Air pumps and compressed air outfits.
 Mason Wrench & Tool Co.—First National Bank Bldg. Wrenches.
 Matchless Metal Polish Co.—94 Market St. Metal polish.
 Maxfield & Co., Glen C.—170 E. Madison St. Caps.
 McCanna Mfg. Co.—56 N. Jefferson St. Lubricators, spark plugs.
 McCord & Co.—1400 Old Colony Bldg. Aluminum, carbureters, brass, bronze, aluminum and copper castings, gaskets, lubricators, oil pumps, patterns, circulating pumps, radiators, machine screw products, spark plugs, tire pumps.
 McFarlane Wagon Works.—100 W. Harrison St. Wood and metallic bodies.
 Meckel, F. L.—77 E. 13th St. Automobile tops.
 Metal Specialty Mfg. Co.—14-24 W. Randolph St. Pressed steel products, screw machine products, spark plugs, stampings.
 Meyercord Co.—Chamber of Commerce. Name plates.
 Mica Insulator Co.—Mica.
 Millwood Mfg. Co.—55th St. and South Park Ave. Wind shields.
 Monahan Antiseptic Co.—92 Market St. Automobile body soaps.
 Morgan & Wright.—81 Michigan Ave. Tires.
 Motor Car Heater Co.—21 Quincy St. Automobile heaters.
 Motor Specialty Mfg. Co.—105 Washington St. Electric lock switches.
 Munson Bell Co., Chas.—88 Franklin St. Rawhide gear wheels.

ILLINOIS—Chicago (Continued).

Murry, W. B.—1253 Milwaukee Ave. Gasoline automobile motors.
 National Casket Co.—Lap robes, rain coats, auto heaters.
 Neely, Edward.—244 Wells St. Lubricators.
 Newcomb, A. H.—815 W. 21st St. Timers.
 Newman Clock Co.—Masonic Temple. Auto clocks.
 Neumastic Tire Co.—302 Michigan Ave. Tire fluid.
 North Chicago Machine Co.—Carbureters, clutches, automobile motors, marine motors.
 Novelty Tufting Machine Co.—1200 Michigan Ave. Tufting and upholstering machines.
 O'Brien & Co., W. H.—115 Dearborn St. Carbureters.
 Offset Handle Wrench Co.—123 La Salle St. Wrenches.
 Oliver Mfg. Co.—213 Desplaines St. Jacks, screw jacks.
 Otis Elevator Co.—Railway Exchange. Elevators for garages.
 Palmetto Metal Co.—586 West Lake St. Babbitt metals.
 Parsons Buggy Top Co. Auto robes, auto tops, glass wind shields.
 Paul & Co., J. C.—59 Dearborn St. Metal polishes.
 Peerless Equipment Co.—170 S. Clinton St. Carbureters, spark plugs, timers.
 Pelinka, Frank.—409 Blue Island Ave. Cushions.
 Penn Oil & Supply Co. Oils.
 Pennsylvania Rubber Co.—1241 Michigan Ave. Tires.
 Peterson Mfg. Co., O. W.—1254 Michigan Ave. Generators.
 Pfanstiehl Electrical Laboratory. Spark coils.
 Pierser & Wood.—3838 Vernon Ave. Glass wind shields.
 Precision Appliance Co.—832 Austin Ave. Carbureters, lubricators, oil cups, oil pumps, circulating pumps, timers, universal joints.
 Prosser & Son, Thomas.—Old Colony Bldg. Steel, chrome-nickel steel.
 Quincy, Manchester, Sargent Co.—84 Van Buren St. Treads and wrenches.
 Redington & Co., F. B.—107-109 S. Sangamon St. Transmission gears, lubricators.
 Rutember Co. Gasolene tank gauges.
 Republic Iron & Steel Co.—Bolts and nuts, angle, channel and tee iron and steel, bar iron and steel, steel.
 Republic Rubber Co.—116 Lake St. Tires.
 Ross Engineering Co.—19 S. Jefferson St. Indicators, horns, speedometers.

ILLINOIS—Chicago (Continued).

Ross, H. S.—5607 S. Halsted St. Circulating pumps, marine motors, mufflers, tire irons, glass wind shields.
 Rotary Triplex Pump Co.—126-128 S. Jefferson St. Power driven tire pumps.
 Roth Bros. & Co.—27-29 S. Clinton St. Charging apparatus, electric generators, electric motors.
 Royal Polish Co.—301-303 W. 63rd St. Auto body polishes.
 Rubber Paint Co.—154-156 W. Van Buren St. Enamel, varnishes.
 Ryan & Co., J. J.—68-74 W. Monroe St. Brass, bronze, aluminum and copper castings.
 Schaal, W. R.—27 N. Jefferson St. Timers.
 Sidney Mfg. Co.—5300 Amour Ave. Stampings.
 Skinner & Skinner.—1337 Michigan Ave. Tire pumps, power driven tire pumps.
 Spare Motor Wheel of America, Ltd., The.—Sales Dept., 234-36 Michigan Ave. Spare Wheel.
 Standard Lamp Mfg. Co.—43 S. Canal St. Brazing compound, acetylene generators, lamps.
 Stewart & Clark Mfg. Co.—514 Diversey Blvd. Horns, speedometers.
 Stewart-Mowhy Co.—3214 Shields Ave. Varnishes.
 Stone & Sons, C.—167 Ogden St. Wood and metallic bodies, auto tops.
 Studebaker Bros. Mfg. Co.—378 Wabash Ave. Wood and metallic bodies, auto tops.
 Sullivan Oil Co.—Grease, oil, oil cans.
 Sundberg Co., J. A.—271 W. Kenzie St. Drop forgings.
 Swain Engine Co.—2239 State St. Automobile motors.
 Swinehart Clincher Tire & Rubber Co.—1231 Michigan Ave. Tires.
 Tarrant Foundry Co. Gray iron castings.
 Taylor Trunk Co., C. A.—39 Randolph St. Auto trunks.
 Temple Pump Co., The.—15th St. and 15th Pl. Gasoline Motors.
 Terminal Holder Specialty Co., The.—1251 Michigan Ave. Wire terminals.
 Texas Co., The. Eye shields.
 Thordasen Electric Co.—153 S. Jefferson St. Spark coils.
 Thurston Mfg. Co., The.—356 E. 57th St. Spark plugs.
 Triple Action Spring Co.—1254 Michigan Ave. Shock absorbers.
 Turner Brass Works, The.—72 Michigan St. Aluminum castings, auto bumpers, reserve valves, carbureters, mufflers, oilers, tire pumps, name plates, foot treadles, gasolene torches and appliances.

ILLINOIS—Chicago (Continued).

Tullith Spring Co.—215 N. Polk St. Auto springs.
 Union Carbide Co.—Michigan Ave. and Adams St. Carbide.
 Union Drop Forge Co.—64-71 E. Ohio St. Drop forgings.
 U. S. Jack Co.—128-130 W. Lake St. Jacks and tire tools.
 Universal Electric Storage Battery Co.—Office, 108 La Salle St.; Factory, 36-38 Union Park Pl. Ignition batteries.
 Vesta Accumulator Co.—1336 Michigan Ave. Storage batteries.
 Victor Electric Co. Portable electric buffers, air compressors.
 Viscosity Oil Co. Oils.
 Vivax Storage Battery Co. Storage and primary batteries.
 Volta Storage Battery Co. Storage batteries.
 Warner Clutch Co.—1461 Michigan Ave. Clutches, brakes.
 Watts De Golyer Co.—377 Illinois St. Enamels, varnishes.
 Waugh, T. Milton.—1525 Monadnock Bldg. Leaf springs.
 Wayman & Murphy.—Randolph & Sangamon St. Automobile tops.
 Webster Mfg. Co.—1075 W. 15th St. Axles.
 Weiss & Son, Chas.—4725 Cottage Grove Ave. Curtain fasteners, automobile tops.
 Western Brass Mfg. Co.—21st and Rockwell Sts. Brass, bronze, aluminum and copper castings.
 Western Continental Caoutchouc Co.—1438 Michigan Blvd. Tires.
 Western Electric Co.—259 S. Clinton St. Ammeters and voltmeters, primary batteries, spark coil, electric switches.
 Western Instrument Co.—18-20 W. Randolph St. Screw machine products, stampings.
 White Mfg. Co. Braziers.
 Wilson & Co., F. Cortez.—239-241 Lake St. Underground storage outfits, oil tanks, tunnels, trunk racks, acetylene generators, pumps.
 Wishart Machine Co., John.—63-65 S. Canal St. Vulcanizers.
 Wright Cooler & Hood Mfg. Co.—1545 Michigan Ave. Coolers, radiators, hoods, mud guards, tanks, dashes, garage pans, engine boots.
Publications, Automobile.
 Acetylene Journal.—324 Dearborn St. Engineer, The.—355 Dearborn St. Fore 'N' Aft.
 McClurg & Co., A. C.—215-221 Wabash Ave. Road maps and touring routes.
 Motor Age Publishing Co.—1200 Michigan Ave.
 Motor Way.—Monadnock Block.

ILLINOIS—Chicago (Continued).

Technical World Magazine.
Repairing, Automobile.
 Auto Maintenance Co.—205 N. Jackson Boulevard.
 Binfords Auto Station.—1287 W. Lake St. Garage.
 Bird-Sykes Co.—1470 Michigan Ave. (Corbin, middle west distributors.) Garage.
 Central Auto Co.—Cor. Jackson Blvd. and Franklin St. (2nd hand cars.) Garage.
 Chicago Caloric Engine Co., The.—536 Wabash Ave.
 Chicago Tire Repair Co.—35th St. and Michigan Ave.
 Chicago Vulcanizing Co.—1461-63 Michigan Ave.
 Cleveland Motor Car Co.—1470 Michigan Ave. (Cleveland.)
 Dominick, Wm.—542 Wabash Ave.
 Githens Bros. Co.—1328 Michigan Ave. (Oldsmobile, Stearns.)
 Greer Motor Car Co.—60-68 W. Van Buren St. (Pungs Finch.) Garage.
 Gross Terrace Garage.—Rear 1396 Madison St. Garage, supplies.
 Hansen & Co., A.—44 Hubbard St.
 Haynes Automobile Co.—1420 Michigan Ave. (Haynes.)
 Kimball & Co., C. P.—315 Michigan Ave. (Rauch & Lang.)
 Knox Auto Co. of Illinois.—1208 Michigan Ave. (Knox.)
 Koener Accumulator Co.—420 Wabash Ave. Charging and supplies.
 Makarof, John A.—2436 Michigan Ave. Rear.
 Maxwell-Briscoe-Chase Co.—1407-1409 Michigan Ave. (Maxwell, Marmon, Columbia.) Garage.
 Motor Transportation Co.—565 Carroll Ave.
 McFarland & Gumpfer.—1329 Michigan Ave.
 Nyberg Automobile Works.—30th St. and Michigan Ave. Garage.
 Official Auto Repair Co.—11 Eldridge Court.
 Rayfield & Rayfield.—6523 Wentworth Ave.
 Ross & Kramer.—5607 S. Halsted St.
 Turner & Milnor.—1532-34 Michigan Ave.
 Twenty-ninth St. Auto Station.—95-97 29th St.
 Winton Garage.—466 N. Clark St.
Supply Houses.
 Arnstein, Eugene.—45th and Shields Ave.
 Beckley-Ralston Co., The.—80-84 Michigan Ave.
 Excelsior Supply Co.—233-237 Randolph St.
 Franco-American Auto & Supply Co.—1404-06 Michigan Ave.

ILLINOIS—Chicago (Continued).

Gross Terrace Garage.—Rear 1396 Madison St. Garage, repairing.
Hercules Auto Specialty Mfg. Co.—115 Dearborn St. Jobbers and dealers.
Koener Accumulator Co.—420 Wabash Ave. Charging and repairing.
Seneca Auto Supply Co.—13 Plymouth St.
Vulcanizing and Tire Repairs.
Chicago Vulcanizing Co.—1461-63 Michigan Ave.
Dryden Rubber Tire Co.—449 Wabash Ave. Tire repairs.
Fanning Tire Co.—1470 Michigan Ave.
Model Vulcanizing Co.—1547 Michigan Ave.
Monarch Vulcanizing Works.—26 Rush Street.

DANVILLE—

Automobile Agents and Dealers.
Campbell Bros. (Pope-Toledo.)
Holmes & Bros., Robert. (Holsman, Cadillac, Winton, Franklin.)
Layton, C. G. (Northern.)
Parts and Accessories Manufacturers.
Holmes & Bros., Robert. Tire valves.

DECATUR—

Clubs and Associations.
Decatur Automobile Club. Tom W. Pitner, Sec.
Automobile Agents and Dealers.
Ruhl & Johnston. (Pope-Waverley.)
Starr & Son, J. G. (Northern.)
Garages.
Manecke, H. R.

DE KALB—

Automobile Agents and Dealers.
De Kalb Automobile & Garage Co. (Rambler, Ford.) Garage and repairing.
Sheets & Knoble. (Pope-Waverley.)
Garages.
De Kalb Automobile & Garage Co. (Rambler, Ford.) Repairing.
Repairing, Automobile.
De Kalb Automobile & Garage Co. (Rambler, Ford.) Garage.

DES PLAINES—

Automobile Agents and Dealers.
Evans, C. W. (Northern.)
Garages.
Downey, W. E.

DIXON—

Garages.
Brookner & Co.

DOWNERS GROVE—

Garages.
Fink Livery, F.
Hawkins, H. J. Repairing.
Repairing, Automobile.
Hawkins, H. J. Garage.

EARLVILLE—

Automobile Agents and Dealers.
Smith's Agency & Auto Garage. (Cadillac.)

ILLINOIS (Continued)

Taylor, L. J., & Barnard, J. (Reo, Premier.)

EAST MOLINE—

Automobile Manufacturers, Gasolene.
Moline Automobile Co.

EAST ST. LOUIS—

Parts and Accessories Manufacturers.
Sendelbach Wheel Co. Wood wheels.

EFFINGHAM—

Automobile Agents and Dealers.
Gay, R. A. (Waltham.)

ELBURN—

Automobile Agents and Dealers.
Meredith, J. L. (Maxwell.)

ELGIN—

Automobile Agents and Dealers.
Elgin Hardware Co. (Cartercar.)
Killip, Oscar.—150 S. State St. (Jackson.)

McBride Bros.—River St. (Reo.)

Wood Automobile Co., Frank B.—60-62 River St. (Ford, Rambler, Kisselkar.) Garage; repairing.

Garages.

Adams, Geo. S.—74 Grove Ave.
Wood Automobile Co., Frank B.—60-62 River St. (Ford, Rambler, Kisselkar.) Repairing.

Repairing, Automobile.

Wood Automobile Co., Frank B.—60-62 River St. (Ford, Rambler, Kisselkar.) Garage.

ELLISVILLE—

Automobile Agents and Dealers.
Ellisville Auto Co. (Waltham.)

EVANSTON—

Garages.
Evanston Automobile Garage.—83 Maple Ave.
Schlig & Moore Auto Works.
Parts and Accessories Manufacturers.
Mark Mfg. Co. Wrought iron and steel pipe.

FAIRBURY—

Garages.
Clandon, C. J.

FARMINGTON—

Automobile Agents and Dealers.
Bass, Theo. (Reo, Premier.)
Negley, Chas. (Buick.)
Plummer, Dr. Jas. (Jackson.)

FREEPORT—

Automobile Agents and Dealers.
Held, A. S. (Winton.)

Garages.

Burton, Reeves.
Parts and Accessories Manufacturers.
Stover Mfg. Co. Brass, bronze, aluminum and copper castings, gray iron castings.

Stover Motor Car Co. Marine motors.

GALESBURG—

Automobile Agents and Dealers.
Gale Auto Co.—Prairie St. (Gale.)
Automobile Manufacturers, Gasolene.
Western Tool Works.

ILLINOIS (Continued)

Automobile Manufacturers, Gasolene Commercial.

Western Tool Works.

Garages.

Churchill Hardware Co.—238-240 Main St.

Hobbie & Martin.—244 S. Chambers St.

Walton-Van Huffel Mfg. Co.—244 S. Chambers St.

GALVA—

Automobile Agents and Dealers.

Dack, Fred E. (Compound.)

GENESEO—

Automobile Agents and Dealers.

Wood, John D. (Cameron.)

GLEN ELLYN—

Garages.

Blackburn, H. J.

GREEN VALLEY—

Automobile Agents and Dealers.

Auld, W. C. (Holsman.)

HAMPSHIRE—

Automobile Agents and Dealers.

Kirchhoff & Cook. (Rambler.)

HARVARD—

Automobile Agents and Dealers.

Manley Bros. (Queen, National.)

HARVEY—

Garages.

Perrin, W. T.

HENRY—

Automobile Agents and Dealers.

Henry Auto Co.—Edwards St. (Holsman, Rambler.)

HIGHLAND PARK—

Garages.

Highland Park Auto Station.—Cor.

Park and St. Johns Ave.

McPhearson, A. G.

Whitney, G.

HOMER—

Garages.

Smith, Chas.—Main St.

JACKSONVILLE—

Automobile Agents and Dealers.

Cassell Bros. (Pope-Toledo.)

JERSEYVILLE—

Automobile Agents and Dealers.

Enos & Titterington, Drs. (Holsman.)

Grappel & Schneider. (Lambert.)

Garages.

Wedding, C. H.

JOLIET—

Automobile Agents and Dealers.

Bruce Motor Co., Inc.—100 Cass Ave. (Buick, Knox, Haynes.)

Joliet Auto & Garage Co.—100 Cass Ave. (Winton.)

Steinhart-Jensen Auto Co., 631 Jefferson St. (Holsman.)

Van Fleet Mfg. Co. (Atlas.)

Garages.

Steinhart-Jensen Auto Co.—631 Jefferson St.

ILLINOIS (Continued)

KANKAKEE—

Clubs and Associations.

Kankakee Automobile Club.—C. H. Cobb, Sec.

Automobile Agents and Dealers.

Fleming & Brown.—Station St. (Rambler.)

Fortin, Geo.—237 Court St. (Maxwell.)

Garages.

Gauger, Grant.—229 Court St.

KEITHSBURG—

Parts and Accessories Manufacturers.

Bloomer, R. E. Oil cans.

KEWANEE—

Parts and Accessories Manufacturers.

Western Tube Co. Pipe and brass fittings, wrought iron and steel pipe, safety valves.

LACON—

Automobile Agents and Dealers.

Lacon Auto Co. (National.)

Thompson & Lipcomb.—Washington St. (Jackson.)

LA GRANGE—

Parts and Accessories Manufacturers.

Brophy Belting & Supply Co. Belting.

LAKE FOREST—

Garages.

Lake Forest Automobile & Machine Co.

LELAND—

Automobile Agents and Dealers.

Danielson, O. M. (Auburn.)

LINCOLN—

Automobile Agents and Dealers.

Wasson Co., The. (Pope-Waverley.)

LITCHFIELD—

Automobile Agents and Dealers.

Corzine, W. T. (Waltham.)

MANTENO—

Automobile Agents and Dealers.

Smith's Sons, H. (Cadillac.)

MATOON—

Repairing, Automobile.

Thatcher & Sons.

MELROSE PARK—

Garages.

Davidson, Adam.—13th Ave. and Lake St. Repairing.

Repairing, Automobile.

Davidson, Adam.—13th Ave. and Lake St. Garage.

MENDOTA—

Automobile Agents and Dealers.

Tower & Son Co., J. D. (National.)

Yost & Oester.—Illinois St. (Jackson.)

MOLINE—

Automobile Agents and Dealers.

Ostlund's Garage & Machine Shop.—1320 4th Ave. (Maxwell.)

Parts and Accessories Manufacturers.

Moline Pump Co. Gasoline automobile motors, marine motors.

ILLINOIS (Continued)

MONMOUTH—

Automobile Agents and Dealers.
Kampen & Range. (Holsman.)
Garages.
Weir Cycle & Gun Co.—106 West 1st Ave.

Parts and Accessories Manufacturers.
Maple City Mfg. Co. Oil cans.

MORRIS—

Automobile Agents and Dealers.
McKeen, I. D. (National.)
Walley, Wm. C. (Rambler.)
Garages.
Morris Motor Car Co.—Liberty St.

MOUND CITY—

Automobile Agents and Dealers.
Bartlett, O. L. (Northern.)

MURPHYSBORO—

Automobile Agents and Dealers.
Kronmeyer, Wm. (Pope-Hartford.)

NORMAL—

Automobile Agents and Dealers.
Iseminger, F. G. (Ford.)

NORTH AURORA—

Automobile Manufacturers, Gasoline.
Aurora Motor Works.
Parts and Accessories Manufacturers.
Aurora Motor Works. Brass, bronze, aluminum and copper castings, marine motors.

NORTH EVANSTON—

Automobile Agents and Dealers.
North Shore Auto Garage.—2520 Harrison St. (Buick.)

OAKLAND—

Automobile Agents and Dealers.
Palmer & Peck. (Auburn.)

OAK PARK—

Garages.
Press, John E.—131-133 N. Boulevard.
Wallas & Crandall.—Oak Park Ave. and Madison St.
Wright, Elsom, Jr.—141 N. Boulevard.

ODELL—

Automobile Agents and Dealers.
Trecker & Son, C. (Rambler, Reo, Premier, Buick.)
Garages.
Odell Electric Co.

ORION—

Automobile Agents and Dealers.
Ferguson, B. (Waltham.)

OTTAWA—

Automobile Agents and Dealers.
Knowles, W. H.—Fulton and Jackson Sts. (Locomobile.)
Garages.
Ottawa Garage & Cycle Co.

PANA—

Garages.
Broehl & Galvin.
Parts and Accessories Manufacturers.
Progress Mfg. Co.—12 S. Poplar St. Heaters.

ILLINOIS (Continued)

PARIS—

Automobile Agents and Dealers.
Paris Foundry and Machine Works. (Buick, Waltham.)
Simmons, Burt R.—310 Connolly St. (Waltham, Buick, Pope-Toledo.)

PAW PAW—

Automobile Agents and Dealers.
Beale, S. T. (Maxwell.)

PAXTON—

Garages.
Nordgren & Holderman.

PEORIA—

Clubs and Associations.
Peoria Automobile Club.—R. A. Whitney, Sec.

Automobile Agents and Dealers.

Baker & Co., M. M. (Glide.)
Peoria Auto Co.—711 Main St. (Pope-Toledo, Pope-Waverley, Cadillac, Franklin.)

Automobile Manufacturers, Gasoline.
Bartholomew Co., The.—110 Bradley Ave.

Garages.

Bourdreaux's Automobile Garage.—629 Main St.

Turnbull, Wm.—221 S. Madison St.

Parts and Accessories Manufacturers.

Atlas Foundry Co.—801 S. Washington St. Gray iron castings.

Illinois Auto & Parts Co.—Globe and Main Sts. Gasoline auto motors, timers.

Kinsey & Mahler Co.—400 S. Adams St. Pipe fittings.

PONTIAC—

Automobile Agents and Dealers.

Copeland & Taylor.—221 W. Washington St. (Jackson, Northern.)

Garages.

Copeland & Taylor.—221 W. Washington St. (Jackson, Northern.)

Repairing, Automobile.

Illinois Garage & Mfg. Co. 110 S. Mill St.

POTOMAC—

Automobile Agents and Dealers.

Layton, C. G. (Rambler, Lambert.)

POWELLTON—

Automobile Agents and Dealers.

Monroe, John B. (Waltham.)

PRINCETON—

Automobile Agents and Dealers.

Bradley, S. L.—809-811 N. Main St. (Reo, Ford.) Garage, repairing.

Turnbull, G. A.—440 S. Main St. (Moline.) Garage, repairing.

Garages.

Bradley, S. L.—809-811 N. Main St. (Reo, Ford.) Repairing.

Ennes, J. M.

Miller, F. E.—440 Main St.

Turnbull, G. A.—440 S. Main St. (Moline.) Repairing.

ILLINOIS (Continued)

Repairing, Automobile.

Bradley, S. L.—809-811 N. Main St.
(Reo, Ford.) Garage.

Turnbull, G. A.—440 S. Main St.
(Moline.) Garage.

Parts and Accessories Manufacturers.
Star Ball Bearing Axle Co. Ball bearings.

PROPHETSTOWN—

Automobile Agents and Dealers.
Wilhelm, A. J. (Waltham.)

QUINCY—

Automobile Agents and Dealers.
Plank, A. E. (Dolson.)

Quincy Auto Co. (White.)

Garages.

Gem City Automobile Co.—114 N. 7th St.

Parts and Accessories Manufacturers.
Richardson Lubricating Co. Oils.

RANSOM—

Garages.

Flick, W. C.

RICHMOND—

Garages.

Haythorn, J. W.

ROCKFORD—

Clubs and Associations.

Rockford Automobile Club.—H. W. Dickerson, Sec.

Automobile Agents and Dealers.
Barnes, E. K. (Pope-Waverley.)

Blaisdell Bros. (Cadillac.)

Burr, E. L. & A. M. (Waltham.)

Cole & Son. (Ford, Mitchell.)

Cutler, D. P. (Knox.)

Harrison, Gorham. (Oldsmobile.)

Joslyn Automobile Co. (Rambler.)

Ward, Frank.—404 S. Water St. (Winton.)

Automobile Manufacturers, Gasolene.
Rockford Automobile & Engine Co.

Garages.

Central Garage Co.

Parts and Accessories Manufacturers.
Barnes Co., W. F. & John. Special automobile machinery.

Cole & Son. Bells.

Cotta, Chas. Differential gears, selective type auto transmission gears.

Neumeister, Fred. P. Auto tops.

Rockford Automobile & Engine Co.

Axles, automobile motors, mufflers, wood wheels.

Smith Improved Lock Nut Co. Lock nuts and washers.

ROCK ISLAND—

Automobile Agents and Dealers.

Asay, J. E. (Jewel.)

Smythe, Robert. (Maxwell.)

Parts and Accessories Manufacturers.
Central Electric Mfg. Co.—1525 Second Ave. Primary batteries.

ROODHOUSE—

Repairing, Automobile.

Cain, A. H.

ILLINOIS (Continued)

ST. CHARLES.

Garages.

Hahn, H. J.

Parts and Accessories Manufacturers.
Moline Malleable Iron Co. Malleable iron castings.

SANDWICH—

Automobile Agents and Dealers.

Drieshmire, Jacob. (National.)

Turner, E. A. (Holsman.)

SAVANNA—

Automobile Agents and Dealers.

Zinnel, Frank. (Moline, Oldsmobile.)

SCALES MOUND—

Automobile Agents and Dealers.

Watson, J. C. (Waltham.)

SHELBYVILLE—

Parts and Accessories Manufacturers.

Anderson Engine Co. Automobile motors and marine motors.

SOUTH CHICAGO—

Garages.

Penlecke, Fred.—9120-9122 Erie Ave.
Whiting Foundry & Engine Co.

SPRINGFIELD—

Clubs and Associations.

Springfield Automobile Club.—R. N. Baker, Sec.

Automobile Agents and Dealers.

Gourley, R. J.—409 E. Washington St. (Monarch.) Repairing, supplies.

Hatcher & Caldwell. (Glide.)

Sangamo Auto Garage Co. (Queen.)

Garages.

Illinois Auto Mfg. & Garage Co.

Springfield Auto Mfg. & Garage Co.

Repairing, Automobile.

Gourley, R. J.—409 E. Washington St. (Monarch.) Repairing.

Supplies, Automobile.

Gourley, R. J.—409 E. Washington St. (Monarch.) Repairing.

STERLING—

Automobile Agents and Dealers.

Baer, Roy R.—310 1st Ave. (Carter-car.)

Flock, H. J. (Rambler, Premier.)

Garages.

Bressler, H. J. Repairing.

Repairing, Automobile.

Bressler, H. J. Garage.

STREATOR—

Automobile Agents and Dealers.

Auger, Frank N.—Bloomington St. (Ford.)

Wagner, John.—339 Main St. (Buick.)

Automobile Manufacturers, Gasolene.

Streator Motor Car Co.

Garages.

Halliday Co., The.

Taylor, Ted.—South Park St.

STRONGHURST—

Automobile Agents and Dealers.

Fox, Fred. (Waltham.)

ILLINOIS (Continued)

SYCAMORE—

Automobile Agents and Dealers.

Rykert & Gould—122 California St.
(Cartercar.)

TREMONT—

Automobile Agents and Dealers.

Cooney & Ames. (Glide.)

TROY—

Automobile Agents and Dealers.

Seligman, A. F. (Jewel.)

WAUKEGAN—

Automobile Agents and Dealers.

Waukegan Motor Car Co.—119 S.
Sheridan Rd. (Elmore.)

Automobile Manufacturers, Gasolene.

Chicago Recording Scale Co.

Garages.

Browne, W. D.—132 S. Genesee St.

North Chicago Machine Co.

Parts and Accessories Manufacturers.

Thomas Brass & Iron Co. Pipe and
brass fittings.

WAUPONSEE—

Automobile Agents and Dealers.

Gorham & Newport. (Cartercar.)

WESTERN SPRINGS—

Garages.

Johnson, J. Peter.—Ashland and Chi-
cago Sts.

WEST PULLMAN—

Parts and Accessories Manufacturers.

Chicago Drop Forge & Foundry Co.
Drop forgings.

WINNETKA—

Garages.

Fencher Bros. and Felt.

WOODSTOCK—

Clubs and Associations.

Mt. Henry County Automobile Club.

—E. C. Jewett, Sec.

Automobile Agents and Dealers.

Schuetz & Shaaf. (International.)

Walters & Burger. (Rambler.)

Garages.

Beardsley & Son.

Harrison, O.—Washington St.

O'Connor, W. F.—Clap and Church
Sts.

Repairing, Automobile.

Kanies & O'Connors.—Troop St.

INDIANA.

ALBANY—

Automobile Manufacturers, Gasolene.

Albany Automobile Co.

ANDERSON—

Automobile Agents and Dealers.

Clark Auto.—1201 Main St. (Mitch-
ell, Maxwell.)

Automobile Manufacturers, Gasolene.

Buckeye Mfg. Co.

Automobile Manufacturers, Gasolene

Commercial.

Buckeye Mfg. Co.

Garages.

INDIANA (Continued)

Lambert, W. S.—724 W. 8th St.

Miller Bros. Automobile Co.—1404
Meridian St.

Parts and Accessories Manufacturers.

Barber Mfg. Co. Seat springs.

Hardware Specialty Mfg. Co.—724 W.
8th St. Auto tops.

Osborne Pole & Shaft Co. Jacks.

Perfection Magneto Co. Charging
apparatus, magnetos and ignition
dynamios.

Remy Electric Co. Magnetos, spark
coils and ignition cable.

Robberts, R. M.—140 Indiana Ave.
Auto motors.

Westerfield Motor Co., The.—1525 S.
Main St. Transmission gears, auto
motors, mufflers.

Vulcanizing.

Miller, Chas. E.—1235 S. Meridian St.

ANGOLA—

Automobile Agents and Dealers.

Bachelor, C. A. (Buick.)

Hawk, Frank. (Cadillac.)

ATTICA—

Automobile Agents and Dealers.

Coffing Bros. (Pope-Hartford.)

Kramer-Allen Motor Co.—227 S. Per-
ry St. (Winton.)

Snyder & Kerr. (Jackson, Reo,
Wayne, Overland.)

Garages.

Hickman Automobile Co.

Motorcycle Agents and Dealers.

Kramer-Allen Motor Co.—227 S. Per-
ry St. (Thoroughbred, Marsh.)

AUBURN—

Automobile Agents and Dealers.

Shugers, Geo. (Maxwell.)

Automobile Manufacturers, Gasolene.

Auburn Auto Co.

Kiblinger Co., W. H.

BEDFORD—

Automobile Manufacturers, Gasolene.

Postal Auto & Engine Co.

BERNE—

Automobile Agents and Dealers.

Schug Bros. (Mitchell.)

BLACKHAWK—

Automobile Agents and Dealers.

Smith, G. C. (Waltham.)

BLOOMFIELD—

Automobile Agents and Dealers.

Mansfield & Son, W. H. (Maxwell.)

BRAZIL—

Garages.

Brazil Automobile Garage.—Main St.
Honeter, Roy.—117 W. Main St.

BROOK—

Automobile Agents and Dealers.

Cline, J. W. (Ford.)

BROOKSTON—

Automobile Agents and Dealers.

Kneale & Kneale. (Waltham.)

INDIANA (Continued)

BUTLER—

Parts and Accessories Manufacturers.
Brown Mfg. & Garage Co., J. C.
Anti-skid devices, chain tools.

CAYUGA—

Automobile Agents and Dealers.
Whittington, N. T. (Holsman.)

CEDAR LAKE—

Garages.
Lassen, C. T.

COLUMBUS—

Automobile Agents and Dealers.
Benefield Bros. (Queen.)
Ogden, D.—332 Fifth Ave. (Reo,
Jackson, Wayne, Haynes.) Garage
and repairing.

Garages.
Columbus Machine Works.
Ogden, D.—332 Fifth Ave. (Reo,
Jackson, Haynes, Wayne.) Repair-
ing.

Parts and Accessories Manufacturers.
Reeves Pulley Co.—1225 Seventh St.
Automobile motors and clutches.

Repairing, Automobile.
Ogden, D.—332 Fifth Ave. (Reo,
Jackson, Wayne, Haynes.) Garage.

CONNERSVILLE—

Automobile Manufacturers, Gasolene.
Connerville Motor Vehicle Co.
Parts and Accessories Manufacturers.
Ansted Spring & Axle Co. Leaf
springs.

Central Mfg. Co. Auto bodies.

CONVERSE—

Automobile Agents and Dealers.
Jones, Mark C. (Waltham.) Gar-
age.

Garages.
Jones, Mark C. (Waltham.)

CRAWFORDSVILLE—

Automobile Agents and Dealers.
Albright Auto Co. (National.)
Garages.

City Automobile Co. Supplies.
Supplies, Automobile.
City Automobile Co. Garage.

CROWN POINT—

Automobile Agents and Dealers.
Schwartz, Harry D. (Waltham.)

CULVER—

Parts and Accessories Manufacturers.
Culver Novelty Co. Carbureters.

DECATUR—

Automobile Manufacturers, Gasolene
Commercial.
Coppock Motor Co.

ELKHART—

Automobile Agents and Dealers.
Atkins & Ellwood. (American Sim-
plex.)
Elkhart Garage Co. (White, Max-
well, Mitchell.)
Miller, E. H.—8th St. (Pope-Hart-
ford.)

INDIANA (Continued)

Pratt, Geo. B. (Locomobile.)
Automobile Manufacturers, Gasolene.
Shoemaker Automobile Co.—88-90
Exchange St.

Garages.
Fieldhouse, J. W.
Kidder, H. F.
Shoemaker Auto Co.

Parts and Accessories Manufacturers.
Elkhart Brass Mfg. Co.—Prospect St.
Primary batteries, brass, bronze, al-
uminum and copper castings, oil
guns.

General Manufacturing Co. Clutches,
transmissions, drills.

Manning Transmission Co., E. H.—
307-308 Monger Building. Friction
transmission.

EVANSVILLE—

Automobile Agents and Dealers.
Evansville Auto Co.—5th and Locust
Sts. (Simplicity.)

Fellwock Automobile & Mfg. Co.—
320-322 Upper 4th St. (Maxwell,
Mitchell, Stoddard-Dayton, Na-
tional, Baker, Ford.) Garage, re-
pairing.

Travis Auto Co., C. W.—23 Main St.
(Buick, Pope-Waverley, Cadillac.)

Automobile Manufacturers, Gasolene.
Evansville Auto Co.

Automobile Manufacturers, Gasolene
Commercial.

Single Center Buggy Co.
Worth Motor Car Mfg. Co.—219 Up-
per First St.

Garages.
Brummitt, T. J.
Fellwock Automobile & Mfg. Co.—
320-322 Upper Fourth St. (Max-
well, Mitchell, Stoddard-Dayton,
National, Baker, Ford.) Repairing.

Parts and Accessories Manufacturers.
Evansville Battery & Electrical Co.
Storage batteries.

Fellwock Automobile & Mfg. Co.
Wood and metallic bodies, auto
seats, auto tops, turn tables, glass
wind shields.

Repairing, Automobile.
Fellwock Automobile & Mfg. Co.
320-322 Upper Fourth St. (Max-
well, Mitchell, Stoddard-Dayton,
National, Baker, Ford.) Garage.

FLATROCK—

Garages.
Flatrock Automobile Co. Repairing.
Repairing, Automobile.
Flatrock Automobile Co. Garage.

FLORA—

Automobile Agents and Dealers.
Kitzmiller & Voorhees. (Jewel.)

FORT WAYNE—

Automobile Manufacturers, Gasolene.
Black Mfg. Co.

INDIANA (Continued)

Automobile Agents and Dealers.

Ft. Wayne Motor Car Co. (Cadillac.)
 Griffin Motor Car Co.—118 W. Wayne St. (National, Maxwell, White.)
 Miller, E. H. (Pope-Hartford.)
 New Columbia Machine Works.—239 Pearl St. (Kiblinger.)
 Ohnhaus Automobile Co.—219 Pearl St. (Buick, Oldsmobile, Holsman.)
 Olds, H. B.—315 Columbia St. (Stearns.)
 Peltier, W. (Pope-Toledo.)
 Randall Motor Car Co.—West Berry St. (Mitchell, Ford, Rambler, Model, Stoddard-Dayton.)

Garages.

Roussey Tire Co., A. J.—621 Harrison St.
 Wilkinson, E. J.—617 Clinton St.
Parts and Accessories Manufacturers.
 Auto Top Co.—209 E. Columbia St.
 Storm aprons and curtains, body irons, cushions, auto tops.
 Bowser & Co., S. F. Tanks, storage tanks.
 Fort Wayne Electric Works. Electric motors.
 Fort Wayne Gear Co.—North American Building. Transmission gearing and friction clutches.
 Rastetter & Son, Louis. Wood rims, steering wheels, wire wheels.

FRANKFORD—

Automobile Agents and Dealers.

Model Machine Works.—East Clinton St. (Holsman.)

FRANKLIN—

Automobile Agents and Dealers.

La Grange, J. W. (National.)

GARRETT—

Repairing, Automobile.

Colegroove & Rollins.—South Side.
 Garrett Engine Works.—Quincy St.

GOSHEN—

Automobile Agents and Dealers.

Goshen Auto & Supply Co.—214 N. Main St. (Lambert, Maxwell, Cadillac.)
 Haines, Egbert. (White.)
 Shookman & Son, M. (Waltham.)
 Teegarden & Putt. (Rauch & Lang.)
Parts and Accessories Manufacturers.
 Goshen Motor Works, The.—Lincoln Ave. and 9th St. Marine motors.
 Goshen Rubber Works. Rubber mats, pneumatic tires.
 Oswald Motor Co. Auto and marine motors.
 Western Rubber Co. Rubber cloth.

GREENSBURG—

Automobile Agents and Dealers.

Foley and De Weese.—East St. and Michigan Ave. (Jackson, Logan, Rambler.)
 Foley and Smith. (Jackson.)

INDIANA (Continued)

Hamilton, Henry. (Rambler.)
 Lanhan, Geo. W. (Ford, Maxwell.)
 Peck & Anderson. (Cadillac.)

Garages.

Privett & Arbuckle.

GREENTOWN—

Garages.

Hill, F. R.

HAGERSTOWN—

Parts and Accessories Manufacturers.

Hagerstown Spoke & Bending Co.
 Wood rims, wood wheels.

HARTFORD CITY—

Automobile Agents and Dealers.

Murphy & Cooley. (National.)

HEMLOCK—

Automobile Agents and Dealers.

Wallace, E. N.—Main and Carlisle Sts. (Haynes.)

HUNTINGTON—

Automobile Agents and Dealers.

Bartlett & Frasier.—106 N. Jefferson St. (Buick.)

INDIANAPOLIS—

Clubs and Associations.

Indiana Automobile Club.—R. A. Brown, Sec.

Indianapolis Automobile Racing Assn.
 —F. M. Hoblitt, Sec.; 220 E. New York St.

Indiana State Automobile Ass'n.

Automobile Agents and Dealers.

Beck Livery & Auto Garage.—719 N. Illinois St. (Pope-Toledo.)

Boyd Automobile Co.—415-418 Mass. Ave. (Stevens-Duryea.)

Cadillac Automobile Co.—364 E. Market St. (Cadillac.)

Capitol Auto Co.—New York and Mass. Ave. (Wayne, Reo, Overland.)

Fisher Automobile Co.—330 Illinois Ave. (National, Stoddard-Dayton, Mitchell, Maxwell.) Garage, repairing.

Gibson Auto Co.—238 Mass. Ave. (Ford, Premier.) Repairing.

Hearsey Vehicle Co.—116 W. Market St. (Rambler, White, Marmon.)

Indiana Auto Co.—220 E. New York St. (Peerless, Winton, Franklin Autocar, Baker, Pope-Hartford.)

Indianapolis Motor Car Co.—111 Kentucky Ave. (Dragon, Rapid.)

Sullivan Auto Co., The D. B.—27 N. Capitol Ave. (Lambert.)

Summer, S. J. (Holsman.)

Sutherland, R. L.—115 W. Maryland St. (Glide.)

Victor Automobile Co.—809 Mass. Ave. (Marvel, Dragon.)

Automobile Manufacturers, Electric.

National Motor Vehicle Co.—2100 E. 22d St.

Pope Motor Car Co.

INDIANA (Continued)

Automobile Manufacturers, Electric Commercial.

Pope Motor Car Co.

Automobile Manufacturers, Gasolene.

American Motor Car Co.

Howe Fire Engine Co.

Marion Motor Car Co.—W. 15th St. and Big Four Ry.

National Motor Vehicle Co.

Nordyke & Marmon Co.

Overland Automobile Co.—Standard Ave. and Division St.

Premier Motor Mfg. Co.

Automobile Manufacturers, Gasolene Commercial.

Marion Motor Car Co.

Premier Motor Mfg. Co.

Garages.

Fisher Automobile Co.—330 Illinois St. (National, Stoddard-Dayton, Mitchell, Maxwell.) Repairing.

Himes-Edin Auto Co.—115 W. Maryland St.

Sears Bros. Co.—750-752 Mass. Ave.

Motorcycle Agents and Dealers.

Westing Co., G. H.—219 Mass. Ave. (Indian.)

Parts and Accessories Manufacturers.

The G. & J. Tire Co.—549-625 E. Georgia St. Automobile and motor cycle tires.

Bates Forge Co.—227 W. Merrill St. Crank shaft, drop forgings, axles.

Capital Auto Co. Jacks, auto tops, glass wind shields.

Christian Off & Co. Dashes and fenders, hoods, tanks.

Diamond Chain & Mfg. Co.—231 W. Georgia St. Chains, auto parts.

Heitger Carbureter Co.—205-207 W. South St. Carburetters.

Henricks Novelty Co.—130 S. Capital Ave. Magnetos and ignition dynamos.

Hercules Electric & Mfg. Co.—709 Langsdale Ave. Ignition magnetos.

The Hobson Wrench Co. Wrenches.

Hoffman, Geo. W.—55 E. Washington St. Metal polishes.

Indianapolis Bolster Spring Co.—326 W. Georgia St. Shock absorbers.

Indianapolis Buggy Top Co. Auto tops.

Indianapolis Dash Co. Dashes and fenders, Dos-a-Dos, seats.

Indianapolis Drop Forging Co.—Madison Ave. and Downey St. Drop forgings, drop forged wrenches.

Indianapolis Foundry Co. Gray iron castings.

Langsenkanp-Wheeler Co. Brass, bronze, aluminum and copper castings.

Lilly Varnish Co.—670 Rose St. Varnishes.

INDIANA (Continued)

Marvel Mfg. Co.—15½ Virginia Ave. Carburetters.

McCutcheon Gear & Mfg. Co.—205 W. South St. Steering gears, steering wheels, axles, forgings and machine works to order.

National Casket Co. Lap robes, rain coats, auto heaters.

Pioneer Brass Works—418-424 S. Penna. St. Brass, bronze, aluminum and copper castings, timers, spark plugs.

Prest-O-Lite Co.—20 South East St. Tanks, gas tanks, tire tanks.

Pyle Mfg. Co.—2211 Park Ave. Acetylene generator, adjustable lamp brackets, lamps.

Robbins & Co., Irwin—32 E. Georgia St. Wood and metallic bodies, auto tops.

Shaffer Carriage Co.—938 N. Illinois St. Auto tops, glass wind shields.

Spacke Mach. Co., The F. W. Air compressors, connecting rods, transmission gears, piston rings, sprockets, power driven tire inflators.

Speed Changing Pulley Co. Carburetters, clutches, auto motors.

Trinity Chime Co., The.—29 N. Capital Ave. Exhaust horns.

Western Storage Battery Co. Storage batteries.

Wheeler & Schebler. Carbureters.

Whiteside Wheel Co.—Canal and W. 10th St. Wheels.

Repairing, Automobile.

Auto Rebuilding Co.—802 Beecher St.

Fisher Automobile Co.—330 Illinois St. (National, Stoddard-Dayton, Mitchell, Maxwell.) Garage.

Gibson Auto Co.—238 Mass. Ave. (Ford, Premier.)

JONESBORO—

Parts and Accessories Manufacturers.

Indian Rubber & Insulated Wire Co. Insulator wires.

KENDALLVILLE—

Automobile Agents and Dealers.

Isbell, J. J.—113 N. Mitchell St. (Auburn.)

KENTLAND—

Automobile Agents and Dealers.

Schuh & Co. (Waltham.)

KNIGHTSTOWN—

Automobile Manufacturers, Gasolene.

Columbia Electric Co.

KOKOMO—

Automobile Manufacturers, Gasolene.

Apperson Bros. Auto Co.

Haynes Automobile Co., The.

Automobile Agents and Dealers.

Mutual Electric Co. (Haynes, Pope-Waverley.)

Sweigert, Frank—44 W. Mulberry St. (Ford.)

INDIANA (Continued)

Garages.

Kokomo Auto & Mach. Co.—44 Mulberry St.

Rost, J. P.

Parts and Accessories Manufacturers.

Byrne, Kingston & Co.—339-351 Smith St. Carburetters, mufflers and pumps.

Havens Co. Wood and metallic bodies.

Kokomo Brass Works—351 N. Smith St. Brass, bronze, aluminum and copper castings.

Kokomo Electric Co.—339 Smith St. Coils, plugs, timers and switches.

Kokomo Rubber Co. Pneumatic tires, solid tires.

KOLEEN—

Automobile Agents and Dealers.

Mansfield & Son, W. H. (National.)

KRAMER—

Automobile Agents and Dealers.

Rice, J. J. (Rambler.)

LAFAYETTE—

Automobile Agents and Dealers.

Shambaugh, Charles, "Auto Inn." (Cadillac, Pope-Toledo, White.)

Tippecanoe Auto Co.—112-114 N. 5th St. (Reo, Jackson, Overland.)

Garages.

Mulhaupt, F. J.—227 N. 5th St. Repairing.

Parts and Accessories Manufacturers.

Harvey Chemical Co. Polishes.

Ross Gear & Tool Co.—149 Main St. Transmission gears, universal joints.

LA GRANGE—

Garages.

La Grange Machine Works.

LA FORTE—

Automobile Agents and Dealers.

Cutler, Austin. (Haynes.)

Garages.

Wolf, J., Lindgren, A. & Weber, M.

Motorcycle Manufacturers.

Great Western Mfg. Co.

LIGONIER—

Automobile Agents and Dealers.

Inks, W. B. (Ford.)

Straus Bros. & Co. (Matheson.)

Garages.

Automobile Garage & Machine Shop—Caven St.

Graves, T. A.—Caven St.

Parts and Accessories Manufacturers.

Haney Gas Engine Co. Auto and Marine Motors.

LINTON—

Automobile Agents and Dealers.

Humphreys, Schloot & Co. (North-ern.)

LOGANSPORT—

Clubs and Associations.

Cass County Automobile Club of Logansport—Fred M. Taft. Sec.

INDIANA (Continued)

Automobile Agents and Dealers.

Case, Henry. (Haynes.)

Logansport Auto Co.—Broadway, nr. 6th St. (Haynes.)

Watts, Harry. (Lambert.)

Garages.

Farry, A. J. G.—216 W. Main St.

Myers & Co., C. F.—126 6th St.

Western Motor Co.

Parts and Accessories Manufacturers.

Western Motor Co. Gasoline motors and gray iron castings.

MARION—

Automobile Agents and Dealers.

Campbell Auto Co.—1st and Adams Sts. (Cadillac, Winton, Autocar.)

Thomas, A. J. (Holsman.)

Garages.

Murillo Mfg. Co.

Parts and Accessories Manufacturers.

Halderman, A. O. Adjustable lamp brackets.

Indiana Brass & Bronze Co. Brass, bronze, aluminum and copper castings.

Western Drop Forge Co. Drop forgings, shells (boiler-steel), tanks, storage tanks.

Repairing, Automobile.

Gillespie & Co., L. W.

Vulcanizing.

Campbell Auto Co.—1st and Adams Sts.

MCCORDSVILLE—

Parts and Accessories Manufacturers.

Hanna Storage Battery Co. Storage batteries.

MICHIGAN CITY—

Automobile Agents and Dealers.

Auto-Cycle Equipment Co. (Jackson.)

Wolf, John. (Winton.)

Pinn, W. T. (Waltham.)

Garages.

Brinckmann Bros.—716 Franklin St.

Parts and Accessories Manufacturers.

Western Launch & Engine Works. Motors (marine.)

MISHAWAKA—

Automobile Manufacturers, Gasolene.

Simplex Motor Car Co.

MONTICELLO—

Automobile Agents and Dealers.

Smith, B. K. (Waltham.)

MORELAND—

Automobile Manufacturers, Gasolene.

Stanley Auto & Mfg. Co.

MUNCIE—

Automobile Agents and Dealers.

Carpenter, Albert—723 S. Liberty St. (Pope-Waverley.)

Fudge, C. B.—401-403 S. Walnut St. (Columbus.)

Machine Electric Supply Co.—117 N. Mulberry St. (Mitchell, Maxwell, National.)

INDIANA (Continued)

Sarver, Herman. (Waltham.)
Wachtell & Son, C. S. (Cadillac.)
Zeigler, Roy. (Haynes.)

Garages.

Muncie Auto Parts Co.—210 N. Walnut St.

Muncie Garage & Repair Co.—209 E. Adams St.

Parts and Accessories Manufacturers.

Muncie Auto Parts Co.—Elliott St., L. E. N. Yards. Transmission and steering gears, universal joints, steering wheels, clutches, levers and machine works.

Muncie Gear Works—801 E. Charles St. Differential gears.

Stratton Carriage Body Co. Auto bodies.

Warner Gear Co. Differential and transmission gears, metal gear wheels, steering apparatus.

Whitely Steel Co. Steel castings.

Repairing, Automobile.

Crozier, Cary—Westside.

Vulcanizing.

Jones, Geo. L.—910 S. Walnut St.

NAPANEE—

Garages.

Keller, J. M.
Volkman, C. F.

NEW ALBANY—

Garages.

Walker, E. C.—1913 Logan St.

NEW CASTLE—

Automobile Agents and Dealers.

Newly's Auto Inn—1122 W. Broad St. (Maxwell, Premier, National, Rambler.)

Strong, G. (Holsman.)

Repairing, Automobile.

Carman, J. R.—1546 E. Broad St.

OTTERBEIN—

Automobile Agents and Dealers.

Opp Hardware Co. (Lambert.)

OXFORD—

Automobile Agents and Dealers.

Heath, Ed. (Haynes.)

PENDLETON—

Parts and Accessories Manufacturers.

Motsinger Device Mfg. Co.—36 Main St. Magneto and ignition dynamos, mufflers.

PERRYSVILLE—

Automobile Agents and Dealers.

Volkel, Wm. (Holsman.)

PERU—

Automobile Agents and Dealers.

Moseley, O. (Holsman.)

Automobile Manufacturers, Gasoline.

Model Automobile Co.

Automobile Manufacturers, Gasoline, Commercial.

Model Automobile Co.

INDIANA (Continued)

Parts and Accessories Manufacturers.

Model Automobile Co. Automobile motors.

Parkhurst Mfg. Co. Gray iron castings, elevators.

PINE VILLAGE—

Automobile Agents and Dealers.

Rhode Clarke. (Haynes.)

PORTLAND—

Automobile Agents and Dealers.

Forry, Ed. S.—120 S. Meridian St. (Jewell.)

White, Frank. (Pope-Hartford.)

Garages.

Jones Cycle & Automobile Co.—132 E. Main St.

REMINGTON—

Automobile Agents and Dealers.

Dye, C. T. (Glide.)

Parker, Robt. (Waltham.)

RICHMOND—

Clubs and Associations.

Automobile Club of Wayne Co.—Walker Land, Sec.

Automobile Agents and Dealers.

Gaines & Whitesell—1207 Main St. (Stoddard-Dayton, Maxwell, White, Pope-Waverley.)

Henley, M. C. (Haynes.)

Garages.

Rodefeld Mfg. Co.—96 W. Main St.

ROMNEY—

Automobile Agents and Dealers.

Haywood & Summers. (Ford.)

RUSHVILLE—

Automobile Agents and Dealers.

Case-Long Mach. Co. (Cadillac, Waltham.)

Dean & Cook. (Reo.)

Parsons, J. T.—410 N. Main St. (Cameron.)

Worth & Bowen. (National.)

Garages.

Cook Machine Co.

ST. PAUL—

Automobile Agents and Dealers.

Pagel, C. W., Dr. (Holsman.)

SHELBYVILLE—

Automobile Agents and Dealers.

Montgomery, H. G. (Haynes.)

Peck, O. S. (Cadillac.)

Seifert, E. W., & Co. (Maxwell, National.)

Garages.

Vanderguft Mfg. Co.

SOUTH BEND—

Clubs and Associations.

South Bend Automobile Club—Horace E. Kizer, Sec.

Automobile Agents and Dealers.

Barger, W. H.—226 S. Lafayette St. (Cadillac and Waltham.)

Briggs, E. C.—127 E. Jefferson St. (Franklin.)

Frazier & Frazier. (Rambler.)

INDIANA (Continued)

Shuey, M. A.—110 W. Wayne St.
(Monarch, Ford, Atlas.)
Twentieth Century Motor Car Co.—
121-125 S. Lafayette St. (Buick.)
Garage, repairing.

Automobile Manufacturers, Gasolene.
Perfection Automobile Co.
Studebaker Automobile Co.
Tincher Motor Car Co.
Automobile Manufacturers, Electric.
Studebaker Automobile Co.
Automobile Manufacturers, Electric Commercial.

Studebaker Automobile Co.

Garages.

Pine, Dr. Milton B.—127 S. Lafayette St.

Twentieth Century Motor Car Co.—
121-125 S. Lafayette St. (Buick.)
Repairing.

Parts and Accessories Manufacturers.
Collmer Bros.—105 Vistula Ave.
Sprockets.

Folsom Mfg. Co., C. G. Fenders,
tanks, hoods.

H. & H. Dry Battery Co.—754 Michi-
gan St. Primary batteries.

Knoblock-Heidman Mfg. Co. Igni-
tion dynamos and magnetos, spark
coils, battery switches, spark plugs,
ammeters, mufflers, carbureters, bat-
tery connectors.

Repairing, Automobile.

Twentieth Century Motor Car Co.—
121-125 S. Lafayette St. (Buick.)
Garage.

SOUTH RAUB—

Automobile Agents and Dealers.
Shambaugh, Chas. (Pope-Toledo,
Buick, White.)

Waters, Elner R. (Haynes.)

SYRACUSE—

Automobile Agents and Dealers.
Reilly, C. J. (Waltham.)

TERRE HAUTE—

Clubs.

Terre Haute Automobile Club—John
S. Cox, Sec.

Automobile Agents and Dealers.

Wabash Auto and Elec. Co. (Jack-
son.)

Parts and Accessories Manufacturers.
Terre Haute Carriage & Body Co.—
101 Wabash Ave. Wood and metal-
lic bodies.

Wabash Gear Works. Differential
gears, metal gear wheels.

UNION CITY—

Automobile Agents and Dealers.

Newburn, J. R. (Northern.)

Parts and Accessories Manufacturers.
Tritt Electric Co.—301 Division St.
Magnetos, spark coils, storage bat-
teries, storage battery chargers, bat-
tery switches, spark plugs.

INDIANA (Continued)

Union City Body Co.—West Pearl St.
Automobile seats and bodies.

Wogaman, J. Webster. Wood and
metallic bodies.

VALPARAISO—

Automobile Agents and Dealers.

Dodge, M. M. (Maxwell.)

Garages.

Summer, S. J.—Main St.

Parts and Accessories Manufacturers.

Chicago Mica Co. Mica.

Upthegrove Sporting Goods Co. Mis-
cellaneous wearing apparel.

WABASH—

Automobile Agents and Dealers.

Grover & Danbar—11 W. Canal St.
(Rambler, White, Jewell, Pope-
Waverley.)

Rettig, F. J.—Canal St. (Lambert,
Ford.)

Parts and Accessories Manufacturers.

Barcus & Co., Geo. Gray iron cast-
ings.

WARREN—

Automobile Agents and Dealers.

Foust & Foust. (Holsman.)

WARSAW—

Automobile Agents and Dealers.

Warsaw Garage Co.—208 S. Indiana
St. (Ford, Premier, Marmon.) Gar-
age and repairing.

Garages.

Warsaw Garage Co.—208 S. Indiana
St. (Ford, Premier, Marmon.) Re-
pairing.

Repairing, Automobile.

Warsaw Garage Co.—208 S. Indiana
St. (Ford, Premier & Marmon.)
Garage.

WASHINGTON—

Automobile Manufacturers, Gasolene.

Hambrick Motor Car Co.

Washington Motor Car Co.

Automobile Manufacturers, Gasolene Commercial.

Hambrick Motor Car Co.

WEST LEBANON—

Automobile Agents and Dealers.

Pomeroy, S. G. (Waltham.)

WHITING—

Repairing, Automobile.

Eustace, G. J., Jr.—46 119th St.

Motorcycle Manufacturers.

Homecker Motor Mfg. Co.

WINCHESTER—

Automobile Agents and Dealers.

Davis, O. E.—Front Ave. (Marmon,
Premier, Ford, Reo.)

Grant, W. C. (Holsman.)

Kenworthy, T. (Auburn.)

Rohr, Frank, E. (Logan.)

INDIAN TERRITORY

TULSA—

Garages.

Tulsa Automobile Co.

IOWA

ADELE—

Automobile Agents and Dealers.
Scott Mfg. Co. (Holsman.)

ATHON—

Automobile Agents and Dealers.
Wetmore, H. A. (Waltham.)

ATLANTIC—

Automobile Agents and Dealers.
Treat, S. W. (Mason.)

BELLEVUE—

Parts and Accessories Manufacturers.
Iowa Marine Engine & Launch
Works. Motor boats.

BETTENDORF—

Automobile Manufacturers, Gasolene.
Meteor Automobile Works, The.

BROOKLYN—

Automobile Agents and Dealers.
Brooklyn Auto & Garage Co. (Reo,
Moline.)

BURLINGTON—

Automobile Agents and Dealers.
Rogers & Co., Ralph—316 N. Main St.
(Rambler, Reo.)
Slutter & Gamble. (Maxwell.)
Parts and Accessories Manufacturers.
Burlington Basket Co. Hampers.

CARROLL—

Automobile Agents and Dealers.
Condon, Dr. C. M. (Waltham.)

CEDAR RAPIDS—

Clubs and Associations.
Cedar Rapids Automobile Club—Geo.
Henderson, Sec.
Automobile Agents and Dealers.
American Automobile Co. (Ameri-
can.)
Cedar Rapids Auto & Supply Co.—
307 Third Ave. (Ford, Maxwell,
Jackson, White.)
Durin, A. E. (American.)
Fawcett, C. E.—119-121 3d Ave. (Na-
tional.) Supplies, garage, repairing.
Henderson Auto Co.—4th Ave.
(Buick, Rapid, Cadillac, Franklin,
Pope-Waverley.)
Western Auto Supply Co.—414-416 3d
Ave. (Mitchell, Reo, Glide.)

Garages.

Fawcett, C. E.—119-121 3d Ave. (Na-
tional.) Repairing, supplies.
Rice, Louis E.
Stepanik, W. H.—116 Tenth St.
Parts and Accessories Manufacturers.
Auto Garment Co.—208 B. Ave. Mis-
cellaneous wearing apparel.
Maxwell, L. R., & Co. Jacks, tire
tools.
Pneumatic Tire Shield Co. Tire
cases.
Repairing, Automobile.
Fawcett, C. E.—119-121 3d Ave. (Na-
tional.) Supplies, garage.
Supplies, Automobile.
Fawcett, C. E.—119-121 3d Ave. (Na-
tional.) Garage, repairing.

IOWA (Continued)

CHARLES CITY—

Automobile Agents and Dealers.
Olds, Arthur L. (Jackson.)
Stevens, B. A. (Locomobile, Cadil-
lac.)
Walsh, Robert. (Rambler.)
Garages.
Johnson Garage—Wisconsin and Blunt
Sts.

CLARION—

Automobile Agents and Dealers.
Bennett, C. S. (Holsman.)

CLEGHORN—

Automobile Agents and Dealers.
Ducommon, H. Emile. (Waltham.)

CLINTON—

Automobile Agents and Dealers.
Fay, C. A.—210 6th Ave. (Reo.)
Hall, John W.—10th Ave. (Maxwell.)
Lamb Auto Co.—207 6th Ave. (Cad-
illac, Mercedes, Peerless, Pope-
Waverley, Baker.)
Standard Automobile Co.—110 5th
Ave. (Moline.) Garage, repairing.
Garages.
Standard Automobile Co.—110 5th
Ave. (Moline.) Repairing.
Parts and Accessories Manufacturers.
Lamb Boat & Engine Co. Auto-
mobile motors.
Lamb Boat & Engine Co. Boat
motors.
Repairing, Automobile.
Standard Automobile Works—110 5th
Ave. (Moline.) Garage.

COUNCIL BLUFFS—

Clubs and Associations.
Council Bluffs Automobile Club—F. S.
Farnsworth, Sec. and Treas.
Automobile Agents and Dealers.
Lonk, Chas. F. (Maxwell.)
Tubbs, Dr. R. B. (Holsman.)
Woolman, Maurice. (Haynes.)
Garages.
Stewart, C. T.
Parts and Accessories Manufacturers.
Kimball Tire Case Co.—629 3d St.
Tire cases, tire shoes, tire treads.

CRESCO—

Automobile Agents and Dealers.
Henley, J. L. (Holsman.)
Ohmacht, L. W. Holsman.)

CRESTON—

Automobile Agents and Dealers.
Edaburn, H. W.—110 N. Elm St.
(Buick, Cadillac.)

CUMBERLAND—

Automobile Manufacturers, Gasolene.
Harper Buggy Co.
Garages.
Bootjer, B. M.

DAVENPORT—

Clubs and Associations.
Automobile Club of Davenport—A. H.
Ruebsam, Sec.

IOWA (Continued)

Automobile Agents and Dealers.

Buck Auto Carriage & Implement Co.—Walsh Bldg. (Buick, Locomobile, Peerless, White, Franklin, Royal, Logan, Haynes.)

Davenport Cycle Co. (Maxwell.)

Iowa Vulcanizing & Tire Co.—408 Main St. (Pope-Hartford, Pope-Toledo, Babcock Electric.)

Janssen Automobile Co., Orey.—310 Main St.

Masons Carriage Co. (Thomas Flyer.)

Mason's Carriage Works—124 E. 4th St. (Winton, Cadillac, Northern, Pope-Waverley.) Garage, repairing.

Peterson, A. W.—320 W. 3d St. (Monarch.)

Zeaman Auto Co., J. A. (Maxwell.)

Garages.

Davenport Auto Co.

Mason's Carriage Works—124 E. 4th St. (Winton, Cadillac, Northern, Pope-Waverley.) Repairing.

Peterson, P. C.

Repairing, Automobile.

Mason's Carriage Works—124 E. 4th St. (Winton, Cadillac, Northern, Pope-Waverley.) Garage.

DES MOINES—

Clubs and Associations.

Iowa Automobile Club—W. B. McNutt, Sec.

Automobile Agents and Dealers.

Brown, Paul A. (Waltham.)

Campbell Auto Co.—612 Mulberry St. (Reo, Rambler, Mason.) Garage, repairing.

Denman, Chas. S.—c/o Des Moines Water Works. (Woods.)

Goodwin Motor Car Co.—6th and Mulberry Sts. (Mason, Rambler.)

Hall, C. A. (Maxwell.)

Howard Automobile Co. (Glide.)

Iowa Auto & Supply Co.—407 4th St. (White, Thomas Flyer.)

Jackson Agency. (Jackson.)

Pixley, O. C.—Des Moines Clay Mfg. Co. (Jewell.)

Riddell Auto Co.—8th and Locust Sts. (Buick, Cadillac, Franklin, Winton.)

Sears-Nattinger Auto Co.—812 Walnut St. (Ford, Reo, Columbus, Stoddard-Dayton.)

Williams, T. J. (Holsman.)

Automobile Manufacturers, Gasolene.

Criterion Motor Co.

Mason Motor Car Co.—E. 5th and Vine Sts.

Garages.

Campbell Auto Co.—612 Mulberry St. (Reo, Rambler, Mason.) Repairing.

Criterion-Motor Co.

Iowa Brass & Novelty Works—117 Grand Ave.

IOWA (Continued)

Repairing, Automobile.

Campbell Auto Co.—612 Mulberry St. (Reo, Rambler, Mason.) Garage.

DUBUQUE—

Automobile Manufacturers, Gasolene.

Adams Co., The.

Automobile Agents and Dealers.

Idaho Auto & Electric Trans. Co.—Rm. 306 Bank & Ins. Bldg. (Rapid.)

Garages.

Boldt & Son, G. H.—Locust and 4th Sts.

Gordon, C. C.—866 Clay St.

Parts and Accessories Manufacturers.

Adams Co., The. Special automobile machinery.

Thomas Connolly Carriage Works—7th and Iowa Sts. Wood and metallic bodies.

McDonald & Morrison Mfg. Co., A. Pipe and brass fittings.

EAGLE GROVE—

Automobile Agents and Dealers.

Wasem & Beals. (Waltham.)

EMMETSBURG—

Automobile Agents and Dealers.

Emmetsburg Auto & Gas Engine Co. (Dolson, Jackson.)

Hoyer, J. M. (Cadillac.)

Palo Alto Hardware & Improvement Co. (Waltham.)

FORT DODGE—

Automobile Agents and Dealers.

Campbell Auto Co.—508 Central Ave. (Reo, Rambler, Mason.) Garage, repairing.

Fort Dodge Auto Co. (Cadillac.)

Ronell, A. L. (Deere.)

Garages.

Campbell Auto Co.—508 Central Ave. (Reo, Rambler, Mason.) Repairing.

Heath, C. H.

Peterson, O. P.—Box 207.

Repairing, Automobile.

Campbell Auto Co.—508 Central Ave. (Reo, Rambler, Mason.) Garage.

FORT MADISON—

Automobile Agents and Dealers.

Sallander, A. W.—627 Front St. (Buick, Cadillac.)

GARNER—

Garages.

Grovers, H. B.

Motorcycle Manufacturers.

Dusenber, A. S.

GARWIN—

Automobile Agents and Dealers.

Knight, Jacob. (Waltham.)

GODELL—

Automobile Agents and Dealers.

Butts, C. W. (Holsman.)

GRINNELL—

Automobile Agents and Dealers.

Grinnell Garage Co. (Ford, Reo.)

IOWA (Continued)

Parts and Accessories Manufacturers.
Morrison, McIntosh & Co.—63 Broad
St. Wearing apparel, gloves and
gauntlets.

HAMPTON—

Automobile Agents and Dealers.
Hobbie, L. W. (Holsman.)

HARTLEY—

Parts and Accessories Manufacturers.
Invincible Tire Armor Co. Tire
treads.

HARVARD—

Automobile Agents and Dealers.
Hinkle, G. W. (Holsman.)

INDEPENDENCE—

Automobile Agents and Dealers.
Heald & Co., J. C. (Winton.)
Lynch Auto Co., A. S. (Waltham.)
Stites, C. W. (Haynes.)

IOWA CITY—

Automobile Agents and Dealers.
Carson, Frank C. (Knox.)
Knease, Henry. (Rambler.)
Schmidt Automobile Co. (Mitchell.)
Repairing.

Garages.

Rabeneau, Edwin.
Schmidt Automobile Co.—327 S. Gil-
bert St. (Mitchell.) Repairing.

Repairing, Automobile.

Schmidt Automobile Co.—327 S. Gil-
bert St. Garage.

JEFFERSON—

Automobile Agents and Dealers.
Lonk, C. F. (Maxwell.)

KALONA—

Automobile Agents and Dealers.
Lonek & Boehme. (Moline.)

KELLOGG—

Garages.

Craven Garage.
Kellogg Garage Co.

KEOKUK—

Automobile Agents and Dealers.

Ecker, J. D. (Holsman.)
Gate City Motor Car Co.—815 Main
St. (National, Rambler.) Repair-
ing.

Repairing, Automobile.

Ayer Mfg. Co.—815 Main St.
Gate City Motor Car Co.—815 Main
St. (National, Rambler.)

LEMARS—

Automobile Agents and Dealers.

Trenery & Co., C. L.—Block No. 4,
700-702 Court St. (Gale, Queen,
Olds.) Garage and repairing.

Garages.

Trenery & Co., C. L.—700-702 Court
St. (Gale, Queen, Olds.) Repair-
ing.

Repairing, Automobile.

Trenery & Co., C. L.—700-702 Court
St. (Gale, Queen, Olds.) Garage.

IOWA (Continued)

LUCAS—

Automobile Agents and Dealers.
Pedigo, R. E. (Waltham.)

LYONS—

Automobile Agents and Dealers.
Spalin, J. C. (Waltham.)
Parts and Accessories Manufacturers.
Pelton Gaso. Engine Works. Motor
boats.

MANCHESTER—

Automobile Agents and Dealers.
Manchester Auto Co. (Pope-Waver-
ley Elec., Reo, Columbia, Franklin.)
Garage, repairing.

Garages.

Manchester Auto Co. (Jackson, Buick,
Northern, Cadillac, Pope-Waverley,
Electric, Reo, Columbia, Franklin.)
Repairing.

Repairing, Automobile.

Manchester Auto Co. (Jackson, Buick,
Northern, Cadillac, Pope-Waverley,
Electric, Reo, Columbia, Franklin.)
Garage.

MARCUS—

Garages.

Collins, Dan.—Main St.

MARSHALLTOWN—

Automobile Agents and Dealers.
Eldridge Beebe Auto Garage Co.—1st,
Main and State Sts. (Rambler.)
Parts and Accessories Manufacturers.
Hawkeye Wrench Co. Wrenches.

MASON CITY—

Clubs and Associations.

Mason City Auto Club—W. H. Hath-
orn, Sec.

Automobile Agents and Dealers.

Hathorn Auto Co.—Cor. 5th and
Washington Sts. (Winton, Cadil-
lac, Northern, Buick, White Steam-
er.) Garage, repairing.

Garages.

Hathorn Automobile Co.—Cor. 5th
and Washington Sts. (Winton, Cadil-
lac, Northern, Buick, White Steam-
er.) Repairing.

Repairing, Automobile.

Hathorn Auto Co.—Cor. 5th and
Washington Sts. (Winton, Cadil-
lac, Northern, Buick, White Steam-
er.) Garage.

MINEOLA—

Automobile Agents and Dealers.

Nipp, Chas. F. (Waltham.)

MUSCATINE—

Automobile Agents and Dealers.
Jackson Electric Supply Co.—225 W.
2d St. (Maxwell, Rambler.)

NEW LONDON—

Automobile Agents and Dealers.
Cook, C. E. (Holsman.)

NEWTON—

Automobile Agents and Dealers.
Miles, E. J. (Holsman.)

IOWA (Continued)

NORA SPRINGS—

Automobile Agents and Dealers.
Eggers, W. W. (Glide.)

OSAGE—

Automobile Agents and Dealers.
Grow Automobile Co. (Mora.)

OSKALOOSA—

Automobile Agents and Dealers.
McClure, Don P. (Buick, Columbia,
Winton, Maxwell.)

OTTUMWA—

Automobile Agents and Dealers.
Iowa Auto Co. (Ford.)
McClure, Don P. (Winton, Pope-
Hartford, Pope-Waverley, Colum-
bia.)

PELLA—

Automobile Agents and Dealers.
Rietveld, H. (Waltham.)

PIERSON—

Automobile Agents and Dealers.
McGraw, G. P. (Cadillac, Northern.)

RIVERTON—

Garages.
Hayes, C. F.

ROCK RAPIDS—

Parts and Accessories Manufacturers.
Perfect Tire Co. Tire treads.

ST. ANSGAR—

Automobile Agents and Dealers.
Stewerwald Machinery Co. (Mitch-
ell.)

SANBORN—

Garages.
Kerberg & Protepter.

SAUDE—

Automobile Agents and Dealers.
Vaala & Natwig. (Holsman.)

SHREVEPORT—

Automobile Agents and Dealers.
Carter, Foster—520 Spring St. (Max-
well.)
Shreveport Auto & Gas Engine Co.—
319 Spring St. (Pope-Toledo.)

SIOUX CITY—

Automobile Agents and Dealers.
Groves Co., H. B.—609 Pierce St.
(Northern, Buick, Cadillac, Pope-
Waverley, Thomas Flyer.)
Inter-State Auto & Supply Co.
(Premier.)
Warnock Co., Wm.—324 Fourth St.
(Ford, Rambler, Maxwell.)

STACEYVILLE—

Automobile Agents and Dealers.
Covey, York. (Holsman.)

STORM LAKE—

Garages.
Witter & Hoch.

VAN HORNE—

Automobile Agents and Dealers.
Wicke, J. A.—2nd St. (Moline.)
Garage, repairing.

IOWA (Continued)

Garages.

Wicke, J. A.—2nd St. (Moline.)
Repairing.

Repairing Automobile.

Wicke, J. A.—2nd St. (Moline.)
Garage.

WALCOTT—

Automobile Agents and Dealers.
Stohbeen, J. W. (Waltham.)

WAPELLO—

Automobile Agents and Dealers.
McCray, Jas. E. (Holsman.)

WATERLOO—

Automobile Agents and Dealers.
Brown Buggy Co. (Jackson.)
Corn Belt Auto Co. (Reo.)
Galloway Co., Wm.—Equitable Bldg.
(Cadillac.)

WAVERLY—

Garages.
Page, Sewell, Jr.

WEBSTER CITY—

Garages.
Groves, H. B.

WELLMAN—

Automobile Agents and Dealers.
Brown, W. J. (Glide.)

WEST CEDAR RAPIDS—

Parts and Accessories Manufacturers.
Tokheim Mfg. Co.—N. 1st St. Oil
pumps and tanks, gasoline tanks, oil
outfits.

WEST POINT—

Automobile Agents and Dealers.
Smith, L. (Cartercar.)

KANSAS

ABILENE—

Automobile Agents and Dealers.
Dunnett, M. L. (Waltham.)

ARKANSAS CITY—

Automobile Agents and Dealers.
Kimball, L. B. (Waltham.)

ATWOOD—

Automobile Agents and Dealers.
McIrwin & Walker. (Jewell.)

CHANUTE—

Garages.
Montague Auto Co.

CONCORIA—

Automobile Agents and Dealers.
Wetzig & Vermette. (Waltham.)

DETROIT—

Automobile Agents and Dealers.
Swanget, H. E. (Waltham.)

ELLSWORTH—

Automobile Agents and Dealers.
Trimble, G. T. (Northern.)

ESBON—

Automobile Agents and Dealers.
Klim, H. B. (Autocar.)

FREDONIA—

Automobile Agents and Dealers.
Patterson, F. H. (Waltham.)

KANSAS (Continued)

GALENA—

Automobile Agents and Dealers.

Galena Auto & Garage Co.—Cor. 9th and Main Sts. (Pope-Toledo, Pope-Hartford, Northern, Reo.) Garage, repairing.

Storm, W. A. (Model.)

Garages.

Campbell, T. V.

Galena Auto & Garage Co.—Cor. 9th and Main Sts. (Pope-Toledo, Pope-Hartford, Northern, Reo.) Repairing.

Repairing, Automobile.

Galena Auto & Garage Co.—Cor. 9th and Main Sts. (Pope-Toledo, Pope-Hartford, Northern, Reo.) Garage.

GARDEN CITY—

Automobile Agents and Dealers.

Griswold, A. H. (Jackson.)

GIRARD—

Automobile Agents and Dealers.

Barkers & Hitch. (Northern.)

GOODLAND—

Garages.

Seyler, Wm.

HUTCHINSON—

Automobile Agents and Dealers.

Horner, P. B. (Cadillac.)

Martin Auto Co. (Northern.)

INDEPENDENCE—

Automobile Agents and Dealers.

Johnson Warren Co. (Jewell.)

JUNCTION CITY—

Automobile Agents and Dealers.

Tyler & Swezey. (Rambler, Premier.)

KANSAS CITY—

Automobile Agents and Dealers.

Ford Motor Co. (Ford.)

KINSLEY—

Automobile Agents and Dealers.

Colver & Beale. (Cadillac.)

Garages.

Kinsley Auto Co.

LARNED—

Garages.

Woelk, W. N., Jr.

LAWRENCE—

Automobile Agents and Dealers.

Lawrence St. Motor Car Co.—13-15-17 W. Warren St. (Ford.) Garage, repairing.

Rutter, C. L.—Henry and Hampshire Sts. (Pope-Waverley, Maxwell.)

Garages.

Lawrence St. Motor Car Co.—13-17 W. Warren St. (Ford.) Repairing.

Repairing Automobile.

Lawrence St. Motor Car Co.—13-17 W. Warren St. (Ford.) Garage.

LEAVENWORTH—

Automobile Agents and Dealers.

Auto Machine Works & Garage—413 S. 5th St. (Ford.)

KANSAS (Continued)

Tholen Bros.—304 Shawnee St. (Cadillac.)

LEOTI—

Automobile Agents and Dealers.

Chamberlain, R. R. (Waltham.)

LINN—

Automobile Agents and Dealers.

Kappelman, J. A. (Holsman.)

McPHERSON—

Garages.

Salthouse, John T.

Temple, T. W.—118 S. Main St.

MARION—

Automobile Agents and Dealers.

Shanklin, W. J. (Waltham.)

NEWTON—

Automobile Agents and Dealers.

Gavitt Auto & Supply Co. (White.)

PITTSBURG—

Automobile Agents and Dealers.

Pittsburg Automobile Co. (Pungs-Finch.)

RICHFIELD—

Automobile Agents and Dealers.

Wilson, E. C. (Holsman.)

ST. JOHNS—

Garages.

Tanner, W. A.

SALINA—

Automobile Agents and Dealers.

Methven, D. C. (Cameron.)

SALEM—

Automobile Agents and Dealers.

Cool, B. (Maxwell.)

SMITH CENTER—

Automobile Agents and Dealers.

Nelson, W. H. (Waltham.)

STOCKTON—

Garages.

Gudger & Ewing.

TOPEKA—

Clubs and Associations.

Topeka Automobile Club.

Automobile Agents and Dealers.

Mathews Auto Co., C. S. 514-516

Jackson St. (Ford.)

Morrison, C. H.—603 Kansas Ave. (Studebaker.)

Noble & Co., Geo. M. (Holsman.)

Padgett, J. M. (Pope-Waverley.)

Wichita Automobile Co. (Pope-Hartford.)

Automobile Manufacturers, Gasolene.

Smith Auto Co.

Parts and Accessories Manufacturers.

Stitch in Time Vulcanizer Co. Vulcanizers.

Supplies, Automobile.

Topeka Automobile & Cycle Co.—7th and Quincy Sts. Supplies, vulcanizing.

Vulcanizing and Tire Repairing.

Topeka Automobile & Cycle Co.—7th and Quincy Sts. Vulcanizing, supplies.

KANSAS (Continued)

TRESCOTT—

Automobile Agents and Dealers.
Pierce & Hobson. (Waltham.)

VESPER—

Automobile Agents and Dealers.
Garrity & Co., T. C.

WICHITA—

Clubs and Associations.
Wichita Automobile Club.
Automobile Agents and Dealers.
Amarillo Auto Co. (Maxwell.)
Parks, A. S. (Locomobile.)
Wichita Auto Co.—123-125 S. Lawrence Ave. (Reo, Rambler, Maxwell, Pope-Waverley, Stoddard-Dayton.)
Wilson Automobile Co.—118 St. Lawrence Ave. (Stearns, Northern.)
Parts and Accessories Manufacturers.
Mexican Mfg. Co.—239 S. Main St. Metal polishes.
Repairing, Automobile.
Western Automobile & Supply Co.

KENTUCKY

AUGUSTA—

Parts and Accessories Manufacturers.
Neider Co., F. A., The., Inc. Curtain fasteners, knobs and clinch buttons, metal top trimmings.

COVINGTON—

Parts and Accessories Manufacturers.
Fox Reversible Gasoline Engine Co. Marine motors.
Ohio Scroll & Lumber Co. Wood and metallic bodies, wood panels.

CYNTHIANA—

Automobile Agents and Dealers.
Brown, J. F. (Waltham.)

GREENUP—

Automobile Agents and Dealers.
Ohio Valley Auto Co.—3 Main St. (Rambler.) Repairing.
Repairing Automobile.
Ohio Valley Auto Co.—3 Main St. (Rambler.) Repairing.

LEXINGTON—

Automobile Agents and Dealers.
Blue Grass Auto Co. (Stoddard-Dayton.)
Dewhurst Motor Car Co.—136 W. Main St. (Queen.)
Hifnes Motor Co.—134 E. Shore St. (Pope.)
Intercerben Motor Traction Co.—W. Main St. (Manhattan.)
Updike, C. Ora—145 E. Main St. (Rambler.) Garage, repairing, supplies.
Garages.
Updike, C. Ora—145 E. Main St. (Rambler.) Repairing, supplies.
Repairing, Automobile.
Updike, C. Ora—145 E. Main St. (Rambler.) Supplies, garage.

KENTUCKY (Continued)

Supplies, Automobile.

Updike, C. Ora—145 E. Main St. (Rambler.) Garage, repairing.

LOUISVILLE—

Clubs and Associations.
Louisville Automobile Club.—Chas. Chreste, Sec.
Automobile Agents and Dealers.
Barnett & Levy—1049 Third St. (Haynes.)
Kentucky Auto Co.—1051 Third Ave. (Cadillac, Peerless, Knox, Buick, Pope-Waverley.) Garage, repairing.
Kirchdofer Automobile Co.—1702 Baxter Ave. (Reo, Premier.)
Longest Bros.—821 3d Ave. (Ford, Stoddard-Dayton, White, Maxwell.)
McBurnie Auto Co.—Broadway and Jackson St. (Kissel-Kar.)
McFuran, J. C.—1043 3d Ave. (Pope-Toledo, Pope-Hartford.)
Straus & Son, Herman. (Waltham.)
Straus, John, Mason.—3d and Chestnut Sts. (Pierce-Arrow.)
Wells, Prince—814 Fourth Ave. (Rambler.)
Zorn Strauss Co.—522 3d St. (Stevens-Duryea, Franklin.)
Garages.
Davis, R. L.—1003 W. Chestnut St.
Kentucky Auto Co.—1051 Third Ave. (Cadillac, Peerless, Knox, Buick, Pope-Waverley.) Repairing.
Parts and Accessories Manufacturers.
Moran Flexible Joint Co.—149 3d St. Universal joints.
National Casket Co.—Lap robes, rain coats, auto heaters.
Walker & Co., E. C.—1915 Logan St. Flash boilers, burners, steam condensers, fuel regulators, water regulators, thermostats, throttle valves, steam engines, steam fittings and valves.
Repairing, Automobile.
Kentucky Auto Co.—1051 Third Ave. (Cadillac, Peerless, Knox, Buick, Pope-Waverley.) Garage.
Supplies, Automobile.
Walker & Co., E. C.—1913-23 Logan St.
NEWPORT—
Automobile Agents and Dealers.
Wright, B. A. (Haynes.)
OWENSBORO—
Automobile Agents and Dealers.
Dawson, J. T. (Cadillac.)
Owensboro Automobile Co., Inc.—Frederia and 4th Sts. (Columbia, Ford.)
Parts and Accessories Manufacturers.
Carriage Woodstock Co. Wood and metallic bodies.
PADUCAH—
Automobile Agents and Dealers.
Automobile and Garage Co. (Queen, Reo.)

LOUISIANA

LYONS—

Parts and Accessories Manufacturers.
Pelton Gasoline Engine Works. Circulating pumps, vaporizers.

MORGAN CITY—

Automobile Agents and Dealers.
Squires, H. L. (Waltham.)

NEW ORLEANS—

Clubs and Associations.

Automobile Club of New Orleans—
Sam Stone, Jr., Sec., 818 Common St.

Automobile Agents and Dealers.

Automobile Co.—1126 Tulane Ave. (Winton, Locomobile.)

Crescent City Auto Co.—217 S. Rampart Ave. (Cleveland, Thomas Flyer, Northern, Dragon.)

Independent Auto Co.—1016 Common St. (Stoddard-Dayton.)

Glide Motor Car Co.—327 Baronne St. (Glide.)

Janney, P. R.—6040 Herrst St. (Lambert.)

Mehlig, J.—113 St. Charles St. (Knox.)

National Auto Co. (Monarch.)

Perkins, B. C.—504 Tchoupitoulas St. (Apperson.)

Schultz, Chas. C. (Waltham.)

Southern Auto Co., Ltd.—930 Common Ct. (Rambler, Ford, Premier, Leader.)

Testard, H. A.—341 St. Charles St. (Buick, Pope-Toledo, Cadillac.)

Tulane Automobile Co.—933 Perdido St. (Royal Tourist.)

Watters, John S.—233 Baronne St. (Wayne.)

Garages.

Aschaffenburg Co., Ltd.—821 Baronne St.

SHREVEPORT—

Automobile Agents and Dealers.

Carter, Foster—520 Spring St. (Maxwell.)

Henderson Iron Works & Supply Co.—Spring, Cadds and Commerce Sts. (Ford.)

Mogenity, B. F. (Cadillac.)

Palis, F. W.—Spring St. (Buick, Jewel, Stoddard-Dayton.)

Garages.

Gordon Jewelry Co.

MAINE

AUBURN—

Automobile Agents and Dealers.

Darling Automobile Co.—Main and Franklin Sts. (Maxwell, Reo.)

Wills, Geo. E.—84 Court St. (Holsman.)

AUGUSTA—

Automobile Agents and Dealers.

Fifield Bros. (Maxwell.)

Packard, J. E. (Cadillac.)

MAINE (Continued)

Skehan & Co., W. J.—325 Water St. (Franklin, Elmore.)

Garages.

Capital Garage—337 Water St. Repairs, supplies.

White, J. W.—543 Broad St.

Repairing, Automobile.

Capital Garage—337 Water St. Supplies, garage.

Supplies, Automobile.

Capital Garage—337 Water St. Garage, repairs.

BANGOR—

Automobile Agents and Dealers.

Crosby & Co., S. L.—186 Exchange St. (Reo, Knox.) Repairing.

Purinton, A. B.—126 Exchange St. (Columbia.) Supplies, garage, repairs.

Treat & Clark—25 Palm St. (Mitchell, Jackson, Logan, Maxwell.)

Willard Co., H. J. (Cadillac, Winton, Franklin.)

Garages.

Purinton, A. B.—126 Exchange St. (Columbia.) Supplies, repairs.

Repairing, Automobile.

Crosby & Co., S. L.—186 Exchange St. (Reo, Knox.)

Purinton, A. B.—126 Exchange St. (Columbia.) Supplies, garage.

Supplies, Automobile.

Purinton, A. B.—126 Exchange St. (Columbia.) Garage, repairs.

BATH—

Automobile Agents and Dealers.

Bath Automobile & Gas Engine Co.—Broad and Commercial Sts. (Winton, Franklin, Cadillac.) Garage, repairs, supplies.

Garages.

Bath Automobile & Gas Engine Co.—Broad and Commercial Sts. (Winton, Franklin, Cadillac.) Supplies, repairs.

Repairing, Automobile.

Bath Automobile & Gas Engine Co.—Broad and Commercial Sts. (Winton, Franklin, Cadillac.) Garage, supplies.

Supplies, Automobile.

Bath Automobile & Gas Engine Co.—Broad and Commercial Sts. (Winton, Franklin, Cadillac.) Garage, repairs.

Motor Boat Manufacturers.

Bath Marine Construction Co.

Parts and Accessories Manufacturers.

Torrey Roller Bushing Co. Marine motors, hub caps, name plates.

BELFAST—

Motor Boat Manufacturers.

Duplex Roller Bushing Co.

MAINE (Continued)

Parts and Accessories Manufacturers.
Duplex Roller Bushing Co. Brass,
bronze, castings, malleable iron cast-
ings, gasoline motors.
Repairing, Automobile.
Duplex Roller Bushing Co.

BETHEL—

Automobile Agents and Dealers.
Herrick Bros. (Maxwell, Reo.) Re-
pairing.
Repairing, Automobile.
Herrick Bros. (Maxwell, Reo.)

BRIDGTON—

Automobile Agents and Dealers.
Stevens, Dr. F. E. (Cadillac.)

BRUNSWICK—

Automobile Agents and Dealers.
Whitney, R. S.—7 Dunlap St. (Jack-
son, Logan.)

CAMDEN—

Motor Boat Manufacturers.
Barret's Son, A.
Camden Anchor-Rockland Machine
Co.
Parts and Accessories Manufacturers.
Camden Anchor-Rockland Machine
Co. Marine motors, bronze propel-
lers, carburetters, anchor hoists.

CARIBOU—

Automobile Agents and Dealers.
Cushman, A. T. (Jewel.)
Glenn, Jas. H. (Cadillac.)

DEXTER—

Automobile Agents and Dealers.
Fay & Scott. (Reo, Maxwell.) Gar-
age, repairing.
Garages.
Fay & Scott. (Reo, Maxwell.) Re-
pairing.
Repairing, Automobile.
Fay & Scott. (Reo, Maxwell.) Gar-
age.

FAIRFIELD—

Garages.
Sawyer, J. W.

FARMINGTON—

Automobile Agents and Dealers.
McLeary Co., F. E.—51-53 Main St.
(Rambler, Ford.) Garage, repairing.
Spinney, H. I. (Stanley.)
Garages.
McLeary Co., F. E. 51-53 Main St.
(Rambler, Ford.) Repairing.
Repairing, Automobile.
McLeary Co., F. E.—51-53 Main St.
(Rambler, Ford.) Garage.

FORT FAIRFIELD—

Automobile Agents and Dealers.
Holt, E. E.—Main St. (Dolson, Reo,
Waltham.)

HOULTON—

Automobile Agents and Dealers.
Getchell, C. D. (Cadillac.)

KENNEBUNKPORT—

Repairing, Automobile.
Emery Bros.

MAINE (Continued)

KINGFIELD—

Automobile Agents and Dealers.
Stanley, O. N. (Stanley.)

KITTERY—

Garages.
Dragon Automobile Co.

LEWISTON—

Automobile Agents and Dealers.
Rand & Harvey—Elizabeth St. (Stan-
ley.)
Skene, J. W.—88-90 Bates St. (Ramb-
ler, Ford.) Garage, repairing.
Willard Co., H. J.—48 Ash St. (Cad-
illac, Winton.)

Garages.

Lewiston Auto Exchange.
Skene, J. W.—88-90 Bates St. (Ramb-
ler, Ford.) Repairing.
Repairing, Automobile.
Skene, J. W.—88-90 Bates St. (Ramb-
ler, Ford.) Garage.

MACHIAS—

Automobile Agents and Dealers.
Nash, W. B. (Waltham.)

NORTH ANSON—

Automobile Agents and Dealers.
Bunker, F. W. (Reo.)
Hovey, Geo. L. (Cadillac, Winton.)

NORWAY—

Automobile Agents and Dealers.
Leavitt, Wm. C. (Cadillac.)

OLDTOWN—

Motor Boat Manufacturers.
Carleton Canoe Co.
Parts and Accessories Manufacturers.
Kilgore Mfg. Co.—101 Main St. Pneu-
matic shock eliminators.

ORONO—

Automobile Agents and Dealers.
Nash, J. H. (Ford.)

PARIS—

Automobile Agents and Dealers.
Maxim, M. W.—Market Sq. (Wal-
tham.)

PORTLAND—

Clubs and Associations.
Automobile Club of Maine—Howard
Winslow, Sec.
Automobile Agents and Dealers.
Allen Motor Co.—42 Preble St.
(Cameron, Monarch.)
Casco Automobile Co. (Cadillac,
Buick, Elmore; Packard, Peerless,
Winton.)
Chase, Charles S. (Buick.)
Dowling's Garage—26-30 Forest Ave.
(Thomas Flyer, Royal.) Supplies,
garage, repairs.
Eastern Motor Car Co.—Elm St. and
Cumberland Ave. (Rambler.)
Gilson Auto Co., L. C.—881 Congress
St. (Ford, Premier, Reo, Stanley.)
Harmon, Herbert A.—85-87 Cross St.
(American, Mors, Aerocar, White.)

MAINE (Continued)

Maine Motor Carriage Co.—Cor. Free and South Sts. (Haynes, Pope-Hartford, Stevens-Duryea.) Supplies, garage, repairs.

Nickerson Co., F. A.—642 Congress St. (Great Arrow.)

Portland Co., The. (Knox.)

Stoughton Folkins Co.—224 Commercial St. (Maxwell.)

Willard Co., A. J.—18 Forest Ave. (Packard, Elmore, Cadillac, Franklin, Winton.)

Garages.

Brower, C. E.

Clark, L. A. & A. T.—Cottage St.

Congress Square Auto Sta.—18 Forest Ave.

Dowling's Garage—26-30 Forest Ave. (Thomas Flyer, Royal.) Repairs, supplies.

Maine Motor Carriage Co.—Cor. Free and South Sts. (Haynes, Pope-Hartford, Stevens-Duryea.) Repairs, supplies.

Parts and Accessories Manufacturers.

Burrows Co., E. T. Drip pans, foot rests.

Portland Garage Co. Body irons, brakes.

Thompson, F. H.—36-38 Elm St. Machinery springs.

Repairing, Automobile.

Dowling's Garage—26-30 Forest Ave. (Thomas Flyer, Royal.) Supplies, garage.

Maine Motor Carriage Co.—Cor. Free and South Sts. (Haynes, Pope-Hartford, Stevens-Duryea.) Supplies, garage.

Portland Garage Co.—51 Cross St. Repairing.

Rising & Co., C. E.—Park St.

Supplies, Automobile.

Dowling's Garage—26-30 Forest Ave. (Thomas Flyer, Royal.) Garage, repairs.

Maine Motor Carriage Co.—Cor. Free and South Sts. (Haynes, Pope-Hartford, Stevens-Duryea.) Garage, repairs.

Vulcanizing.

Standard, I. D.—9A Casco St.

ROCKLAND—

Garages.

Davis, E. R.—18 Park St.

Rockland Garage & Auto Co.—12-20 Winter St.

RUMFORD FALLS—

Automobile Agents and Dealers.

Stephens, John E.—102 Congress St. (Reo, Maxwell.)

Garages.

Furbish, Fred. A.—28-34 River St.

SANFORD—

Automobile Agents and Dealers.

Sanford Automobile Co. (Cadillac.)

MAINE (Continued)

York County Garage. (Stevens-Duryea, Stanley, Cadillac, Buick.) Repairing, garage.

Garages.

York County Garage. (Stevens-Duryea, Stanley, Cadillac, Buick.) Repairing.

Repairing, Automobile.

York County Garage. (Stevens-Duryea, Stanley, Cadillac, Buick.) Garage.

SKOWHEGAN—

Automobile Agents and Dealers.

Smith, Clyde H. (Cadillac.)

WATERVILLE—

Automobile Agents and Dealers.

Waterville Motor Co.—245-249 Main St. (Reo, Lambert.) Garage, repairing.

Garages.

Central Maine Automobile Garage—8 Charles St.

Waterville Motor Co.—245-249 Main St. (Reo, Lambert.) Repairing.

Repairing, Automobile.

Waterville Motor Co.—245-249 Main St. (Reo, Lambert.) Garage.

WESTBROOK—

Automobile Agents and Dealers.

Woodman Sons, C. B. (Jewel.)

Parts and Accessories Manufacturers.

Foster & Brown. Torch heaters.

Repairing, Automobile.

Foster & Brown.

WILTON—

Automobile Agents and Dealers.

King, W. H. (Holsman.)

WISCASSET—

Automobile Agents and Dealers.

Tucker, J. P. (Haynes.)

WOODFORD—

Automobile Agents and Dealers.

Brower, C. E. (Haynes.)

Garages.

Young, Geo. A.—51 Coyle St.

YORK—

Automobile Agents and Dealers.

Marshall House. (Reo, Premier.)

YORK VILLAGE—

Automobile Agents and Dealers.

York Auto Garage Co.—S. S. S. Block. (Reo, Premier.)

MARYLAND

BALTIMORE—

Clubs and Associations.

Automobile Club of Baltimore—Jas. W. Reese, Sec.

Automobile Club of Maryland—G. S. Dickey, Sec., Hotel Altamont.

Baltimore County Motor Club—Allen Schwartz, Sec.

Maryland State Automobile Association.

MARYLAND (Continued)

Motor Car Racing Association—Jas. G. B. Davy, Sec., 20 St. Paul St. Riding and Driving Club.

Automobile Agents and Dealers.
Automobile Outing & Transportation Co.—Maryland and Mt. Royal Aves. (Buick.)

Auto & Motor Co.—Park Ave. and Biddle St. (Mitchell, Rambler, Queen.)

Auto Motor Company. (Maxwell.)

Auto Supply & Storage Co.—1416 Madison Ave. (National, Lambert, Holzman, Logan, Jewel, Studebaker electric.)

Baltimore Motor Carriage Co.—315 N. Howard St. (Winton.)

Bolton Automobile Co.—Mt. Royal Ave. and Dolphin St. (Ford, Reo, Premier.)

Callahan Atkinson & Co.—1020 Morton St. (Locomobile, Pope-Toledo, Pope-Hartford.)

Chesapeake Motor Carriage Co.—North Ave., near Charles St. (Pullman.)

Decker, W. M. (Monarch.)

Dragon Agency—North Ave. and Charles St. (Dragon.)

Hamilton Auto Co.—2312 Madison Ave. (Stoddard-Dayton.)

Mar-Del Mobile Co.—Charles St. and Mt. Royal Ave. (Packard, Franklin, Elmore, Cadillac, Pope-Waverley, Gallea, Northern.)

Maryland Auto Co.—Lafayette and Carrollton Ave. (Knox, Calvert.)

Matheson Co. of Md.—Continental Bldg. (Matheson.)

Monumental Garage, The—1002 Morton St. (Maxwell.)

Motor Car Co.—Mt. Royal and Maryland Aves. (Peerless, Thomas Flyer, Stanley, Baker, Waltham, Knox, Stevens-Duryea.)

Mt. Vernon Motor Co.—1118 Cathedral St. (Autocar, Haynes, Panhard, Mercedes, Isotta.)

Park Automobile Co.—2359 Madison Ave. (Frayer-Miller.)

Power Vehicle Service Co.—North and Madison Aves. (Welch.)

Rice, M. A. (Rauch & Lang.)

Riggs, J. Dudley—1118 Cathedral St. (Simplex.)

Schaffer Mfg. Co.—308 N. Calvert St. (Jackson, York Pullman, Rapid.)

Shuler, W. P.—1002 Morton St. (Pungs-Finch, Maxwell.)

Snodel Auto Co., Geo. R.—2552 Madison Ave. (Marmon.)

Southern Auto Co.—1200 Mt. Royal Ave. (Pierce Arrow.)

White Garage—1010 Morton St. (White.)

MARYLAND (Continued)

Willhide, J. L. B.—2329 Madison Ave. (Atlas Runabout, Atlas Trucks, Frayer-Miller.)

Winton Motor Carriage Co. (Winton.)

Automobile Manufacturers; Gasoline.
Sinclair-Scott Company, The.

Garages.
Commercial Auto & Supply Co.—826 N. Howard St.

Owens & Co., A. M.—1307 Morton St.

Sandruck, F. W.—913 N. Howard St.

Instruction, Automobile.
Auto & Motor Co., The.

Parts and Accessories Manufacturers.
Ajax-Grieb Rubber Co.—20 St. Paul St. Tires.

Auto Supply & Storage Co. Turntables.

Baltimore Buggy Top Co. Auto tops.

Baltimore Enamel & Novelty Co.—Ft. of Allen St. License numbers, name plates.

Goodyear Tire & Rubber Co.—400 S. Fremont Ave. Tires.

Hector Macrae—316 St. Paul St. Storage batteries.

Keidel & Co., Henry. Gasoline marine motors.

Larrimore Buggy Top Co. Cushions, auto tops.

National Casket Co. Lap robes, rain coats, auto heaters.

Page Engineering Co. Marine motors.

Regesters, J. Sons & Co.—Holiday and Saratoga Sts. Special brass work.

Robinson, Son & Co. Grease, oils, semi-solid oils.

Schaffer Machine Mfg Co., The—211 N. Calvert St. Body irons, fuel and air pumps.

Vulcanizing.
Spoerer's Sons—400 S. Tremont Ave.

BELAIR—

Automobile Agents and Dealers.
Hanway, H. D. (Cadillac.)
Rush, J. K. (Waltham.)

CAMBRIDGE—

Garages.
Cambridge Auto Co.—Poplar and Gay Sts.

CARDIFF—

Automobile Agents and Dealers.
Gaeley Bros. (Waltham.)

CUMBERLAND—

Automobile Agents and Dealers.
Biayas, B. H. (Maxwell.) Garage.
Glisan, A. E. (Cadillac.)

Garages.
Biayas, B. H. (Maxwell.)

Parts and Accessories Manufacturers.
Cumberland Steel Co.—Williams St. and B. O. R. R. Steel shaftings, flange couplings, safety set collars.

Maryland Sheet & Steel Co. Sheet iron and steel.

MARYLAND (Continued)

EASTON—

Automobile Agents and Dealers.
Shannonhan & Wrighson Hardware
Co.—N. Washington St. (Ramb-
ler.)

HAGERSTOWN—

Clubs and Associations.
Hagerstown Automobile Club—Chas.
M. Danzer, Sec.
Automobile Manufacturers, Gasolene.
Crawford Auto Co.

JESSUPS—

Automobile Agents and Dealers.
Bond, R. B. (Cadillac.)

MARTINSBURG—

Garages.
Miller, S. W.

NEW WINDSOR—

Automobile Agents and Dealers.
Smelser, Leslie A. (Cadillac.)

PIKESVILLE—

Clubs and Associations.
Automobile Club of Maryland—F. W.
Darling, Sec.

SALISBURY—

Automobile Agents and Dealers.
Gunly Co., L. W. (Atlas trucks.)

SPARROW POINT—

Parts and Accessories Manufacturers.
Johnston, Geo. H. Steel castings.

TRAPPE—

Automobile Agents and Dealers.
Mulken, J. T. (Cadillac.)

WELLS—

Automobile Agents and Dealers.
Wilson's Garage. (White.)

WESTMINSTER—

Garages.
Keefer, Wm. N.—88 E. Main St.

WILLISTON—

Garages.
Williston Cycle Agency.

MASSACHUSETTS

ABINGTON—

Automobile Agents and Dealers.
Jewett, Alfred R. (Cadillac.)
Motor Boat Manufacturers.
Buffum Co., H. H.

AMESBURY—

Automobile Manufacturers, Electric.
Bailey & Co., Inc., S. R.
Garages.
Atwood Mfg. Co.
Motor Boat Manufacturers.
Atlantic Co., The.
Parts and Accessories Manufacturers.
Amesbury Brass & Foundry Co.—Bow
separators, brass, bronze, aluminum
and copper castings, automobile
seats, top fixtures, metal trimmings.
Amesbury Metal Body Co.—Cor.
Clark and Elm Sts. Aluminum, iron
and steel bodies.
Atlantic Co., The. Marine motors.

MASSACHUSETTS (Continued)

Atwood Mfg. Co. Acetylene genera-
tors, lamps, plates, metal trimmings,
water column mirrors.

Auto Body & Finishing Co. Wood
and metallic bodies.

Biddle & Smart Co. Wood and me-
tallic bodies.

Briggs Carriage Co. Wood and metal-
lic bodies, auto tops.

Carr, Prescott & Co. Wood wheels.

Climax Igniter Co. Magnetos and ig-
nition dynamos, spark plugs.

Currier-Cameron Co.—85 Elm St.
Wood and metallic bodies.

Graves & Congdon Co.—Oak St.
Bodies, tops, seats.

Gray & Davis. Gas and electric and
oil auto lamps, acetylene genera-
tors.

Hume Carriage Co. Wood and metal-
lic bodies, auto covers, foot rests,

robe rails, auto seats, auto tops.

Howarth & Rogers. Wood and metal-
lic bodies.

Lane, T. W. Wood and metallic bod-
ies.

Leitch Mfg. Co. Wood and metallic
bodies.

Miller Bros. Wood and metallic
bodies.

Parry & Co., A. N. Curtain fasteners,
top fixtures.

Powow Foundry. Brass, bronze, al-
uminum and copper castings.

Shields Carriage Co., The. Wood and
metallic bodies, body irons.

Wing Co., Charles. Cushion springs,
auto strappings, hardware, uphol-
stering.

AMHERST—

Automobile Agents and Dealers.
Forbes, Allen H. (Waltham.)

Parts and Accessories Manufacturers.
Esty and Page, Dist. for Common-
wealth Rubber Co., for New Eng-
land, Penn., Indiana and Michigan.

ARLINGTON HEIGHTS—

Parts and Accessories Manufacturers.
Jones & Co., E. J. Steel, brass,
bronze and bell metal balls, small
forgings.

ATTLEBORO—

Automobile Agents and Dealers.
Attleboro Automobile Co.—174 Union
St. (Pope-Waverley, Stanley, Auto-
car, Stevens-Duryea, Pierce-Arrow.)

Auto Electric Co.—41 County St.
(Ford.)

Bristol Motor Car Co.—N. Main St.
(Rambler, Cameron.)

Slater & Co., E. J.—78 Holman St.
(Dragon, Jackson.)

Parts and Accessories Manufacturers.
Blackington & Co., N. H. Name
plates.

Howard Mfg. Co. Tire shoes.

MASSACHUSETTS (Continued)

Mossberg Co., Frank S.—Mann and Mill Sts. Bells, metal stamping, wrenches.

AUBURNDALE—

Garages.

Grant, N. L.—206 Melrose St.

AYER—

Automobile Agents and Dealers.

Procter, E. O.—West Main St. (Jackson, Logan.)

Garages.

Ayer Automobile Station—East Main St. Repairing, supplies.

Repairing, Automobile.

Ayer Automobile Station—East Main St. Supplies, garage.

Supplies, Automobile.

Ayer Automobile Station—East Main St. Garage, repairs.

BEDFORD—

Parts and Accessories Manufacturers.

Shawmut Tire Co.—97 Bedford St. Pneumatic tires.

BEVERLY—

Automobile Agents and Dealers.

Harper's Garage Co. (Reo, Premier, National.)

Wood, J. Elmer.—106-110 Rantoul St. (Sterling.) Garage, repairing.

Automobile Manufacturers, Gasolene.

Beverly Mfg. Co.

Garages.

Beverly Mfg. Co.

Wood, J. Elmer.—106-110 Rantoul St. (Sterling.) Repairing.

Parts and Accessories Manufacturers.

Beverly Mfg. Co. Transmission gears, marine motors, reverse marine gears, machine work to order, gasoline auto motors.

Repairing, Automobile.

Wood, J. Elmer.—106-110 Rantoul St. (Sterling.) Garage.

BOSTON—

Clubs and Associations.

Bay State Automobile Ass'n.—J. Fortescue, Sec., 282 Dartmouth St.

Boston Automobile Dealers' Ass'n., Inc.—5 Park Square.

Massachusetts Automobile Club—F. L. D. Rust, Sec.

Massachusetts State Automobile Ass'n.

Automobile Agents and Dealers.

Austin Agency, Inc.—Motor Mart, Park Sq. (Austin.)

Banfil, W. H.—78 Portland St. (Jewel.)

Barry Co., J. M.—343 Tremont St. (Second-hand cars.) Garage, repairing.

Bay State Auto Co.—112 Norway St. (Queen, Bay State.)

Blake Co., E. P.—21 Hawkins St. (Jackson, Logan.)

MASSACHUSETTS—Boston (Cont.)

Blake, K. M.—400 Newbury St. (Locomobile.)

Bond Bros. Co.—Motor Mart. (Iroquois, Deere.)

Boston Automobile Exchange—177 Berkeley St. (Jackson, Monarch, Logan.)

Boston Motor Co.—91 Church St. (Acme, Pungs-Finch.)

Butler Motor Car Co.—Copley St.; garage, Harcourt St. side. (Cleveland, Pierce-Racine, Rapid.)

Castle, H. C. & C. D.—893 Boylston St. (Lozier.)

Coburn Heath & Co.—1008 Boylston St. (Cameron.)

Columbia Motor Vehicle Co.—74 Stanhope St. (Columbia.)

Commercial Truck Co. of N. E.—255 Atlantic Ave. (Commercial.)

Concord Motor Car Co.—64 Huntington Ave. (Waltham.)

Corson, Myron L.—110 Huntington Ave. (Mitchell.)

Crown Motor Car Co.—23 Motor Mart. (Glide, Aurora.)

Curtis-Hawkins Motor Co.—Motor Mart, Park Square. (Chadwick.)

Darracq Motor Car Co.—171 Huntington Ave. (Darracq.)

Dodge Motor Vehicle Co.—223 Columbus Ave. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

Dragon Automobile Co.—117 Mass. Ave. (Dragon.)

Dunham, G. J.—182-188 Columbus Ave. (Royal Tourist.) Repairing.

Eaton, C. A.—22 E. Concord St. (Lambert.)

Ford Motor Co.—147 Columbus Ave. (Ford.)

Fosdick Co., Harry—Motor Mart, Park Square. (Atlas.)

Frederick Co., W. A.—Motor Mart, 16 Columbus Ave. (American.)

French Carriage Co.—92 Summer St. (Clement-Bayard.)

Fuller, A. T.—4-6 Columbus Ave. (Packard, Cadillac.)

Haigh, Chas. (Pennsylvania.)

Henshaw Motor Car Co.—288 Columbus Ave. (Haynes.)

Hills, Horace B.—5 Park Square. (Rochet-Schneider.)

Jefferey & Co., Thos. B.—145 Columbus Ave. (Rambler.)

Kent, Morgan B.—141 Mass. Ave. (Hotchkiss.)

Linscott Motor Co.—133 Columbus Ave. (Wayne, National, Reo.)

Lowe Co., Geo. H.—509 Tremont St. (American Mors, Aerocar.) Garage, repairing.

Maguire Co., J. W.—745 Boylston St. (Great Arrow.)

MASSACHUSETTS—Boston (Cont.)
 Matheson Co., of Boston—92 Mass. Ave. (Matheson.)
 Maxwell-Briscoe, Boston Co.—121 Mass. Ave. (Maxwell). Repairing.
 Mercedes Import Co. (Mercedes.)
 Metropolitan Automobile Co.—57-61 Stanhope St. (Moon.) Garage, repairing.
 Mills-Kennedy Co.—783 Boylston St. (Springfield, Welch.)
 Morrison Co., A. E.—93 Massachusetts Ave. (Oldsmobile, Stearns.)
 Morrison & Price.—169 Hamilton Ave. (Mitchell, Rainier.)
 New England Automobile Co.—55 Berkeley St. (Second-hand cars.)
 Nichols & Co., D. P.—220 Elliott St., Motor Mart. (Frayer-Miller.)
 Northern Automobile Agency—Park Square, Motor Mart. (Northern.) Repairing.
 Page & Co., W. A.—220 Elliott St. (Simplicity.)
 Panhard & Levassor—222 Elliott St. (Panhard.)
 Parker & Co., F. R.—288 Columbus Ave. (Elmore.)
 Park Square Auto Station—43 Columbus Ave. (Stoddard-Dayton, Berliet.) Garage, repairing.
 Peerless Motor Car Co. of N. E.—178 Columbus Ave. (Peerless.) Garage, repairing.
 Pennsylvania Auto Agency—7 Motor Mart, Park Square. (Pennsylvania, Pullman, Northern.) Repairing.
 Prentiss Motor Car & Supply Co.—15 Berkeley St. (Studebaker.)
 Proctor Supply Co., G. H.—31 Stanhope St. (Stanley.)
 Pullman Auto Agency—7 Motor Mart, Park Square. Pennsylvania, Pullman, Northern.) Repairing.
 Puritan Motor Co.—43 Columbus Ave. (Dolson, Mason.)
 Randall Co., Fred'k E.—245 Columbus Ave. (Stevens-Duryea, Pullman.)
 Randliff Motor Car Co.—893 Boylston St. (Panhard.)
 Reed, Underhill Co.—222 Columbus Ave. (Knox.)
 Smith, Fred S.—38 Columbus Ave. (Walter, Autocar.)
 Squire, G. C.—141 Mass. Ave. (Premier.)
 Stranahan & Eldridge Co.—541 Tremont St. (Buick.)
 Stratton Co., H. C., Inc.—173 Huntington Ave. (De Luxe, Kissel-Kar, American Mercedes.)
 White Co.—320 Newbury St. (White.)
 Whiting Auto Co., H. E.—22 Park Square, Motor Mart. (Mora.)
 Whitney, C. T.—43 Columbus Ave. (Berliet.)

MASSACHUSETTS—Boston (Cont.)
 Whitten-Gilmore Co.—5 Park Square. (Thomas Flyer.)
 Wing Motor Car Co., F. E.—Motor Mart, 12 Columbus Ave. (Marmon.)
 Winton Motor Carriage Co.—Stanhope St. (Winton.)
Automobile Manufacturers, Gasolene.
 Bay State Auto Co.—112 Norway St.
 Heyman Motor Car Co.
 New England Automobile Mfg. Co.—27 State St.
 Sturtevant Mill Co., The.
Automobile Manufacturers, Gasolene Commercial.
 Viking Co., The—801 Boylston St.
Automobile Manufacturers, Steam.
 Essex Motor Car Co.—60 State St.
Garages.
 Back Bay Automobile Co.—169-171-173 Huntington Ave.
 Barry Co., J. M.—343 Tremont St. Repairing. (Second-hand cars.)
 Breed, E. S.—41 Columbus Ave.
 Columbus Road Auto Station—610 Columbia Road.
 Corbin Car Co.—Motor Mart.
 Dudley, Fred F.—55 Berkeley St.
 Howard Automobile Station—Howard Ave.
 Hub Auto Exchange—195 Freeport St.
 Locomobile Co.—400 Newbury St. (Branch Locomobile Co. of America.) Repairing. (Locomobile.)
 Lowe Co., Geo. H.—509 Tremont St. (American Mors, Aerocar.) Repairing.
 Massachusetts Auto Co.—52 Church St.
 Metropolitan Automobile Co.—57-61 Stanhope St. (Moon.) Repairing.
 Milne, Frank—43 Columbus Ave.
 Park Square Auto Station—43 Columbus Ave. (Berliet, Stoddard-Dayton.) Repairing.
 Pattinson Mfg. Co.—Rear 48 Stanhope St. Repairing.
 Peerless Motor Car Co. of N. E.—178 Columbus Ave. (Peerless.) Repairing.
 Quinsler & Co.—26-30 Cambria St.
 Seavey, Wm. G.—616 Blue Hill Ave.
 Transfer Auto Station—234 Dudley St.
 Tremont Garage—541 Tremont St.
 Turner, G. W.—45 Stanhope St.
Insurance, Automobile.
 Boston Insurance Co. Insure against fire and theft.
Instruction, Automobile.
 Boston Auto School.—343 Tremont St.
Motor Boat Manufacturers.
 Burgess & Packard—Board of Trade Bldg.
 Murray & Tregurtha Co.—340 W. First St.

MASSACHUSETTS—Boston (Cont.)

Toppan Boat Mfg. Co.—9 Haverhill St.

Motorcycle Agents and Dealers.

Motor Cycle Specialty Co.—258 Columbus Ave. (Indian.)

Motor Cycle Manufacturers.

Bozoux, Chas. L.—446 Tremont St.

***Parts and Accessories Manufacturers.**

Abell, Rollin.—370 Atlantic Ave. Steam engines.

Aero & Marine Motor Co., The—60 Pemberton Sq. Marine and aeronautical motors.

Ajax-Grieb Rubber Co.—801 Boylston St. Tires.

American Belting Co.—135 Oliver St. Belting.

American Mach. Mfg. Co.—41 Lewis Wharf. Spark coils and spark plugs.

American Oak Leather Co.—176 South St. Leathers.

American Roller Bearing Co.—Tripp St. Roller bearings, axles, counter-shafts.

American Steam Gauge & Valve Co.—220 Camden St. Steam and air gauges, safety valves.

American Steam Packing Co. Packing.

American Thread Co. Top and upholstery thread.

Ashton Valve Co., The—271 Franklin St. Safety valves, pressure gauges, water gauges, gauge cocks.

American Tube Works—137 Milk St. Brass and copper tubing.

Atlantic Motor Supply & Screw Co.—48 Binford St. Spark plugs.

Auto Goods Co.—60 State St. Repair kits.

Automobile Utilities Co.—9 Motor Mart. Inner tubes.

Babcock Varnish Co. Varnishes.

Badger & Sons Co., E. B.—63-69 Pitts St. Dashes and fenders, hoods, tanks.

Badger Fire Extinguisher Co., The—32 Portland St. Fire extinguishers.

Bailie Basket Co.—82 Sudbury St. Baskets.

Bailey & Co, C. J.—22 Boyleston St. Tire treads.

Ball Tool Co. 253 A St. Wrenches.

Barrett Mfg. Co., James. Pipe and brass fittings.

Becker, August—247 Atlantic Ave. Name plates.

Bemus Co., Inc., T. Alton—358 Atlantic Ave. Timers and distributors.

Black, A. B.—21 S. Market St. Timers.

Boston Auto Exchange—177 Berkeley St. Fuel air pumps.

Boston Auto Gauge Co.—613 Old South Blvd. Gasoline tank gauges.

Boston Mat & Basket Co.—62 Fulton St. Hampers.

MASSACHUSETTS—Boston (Cont.)

Boston Steam Specialty Co.—168-170 Congress St. Needle valves, carburettors, priming cups, air cocks, cylinder cocks, brass fittings, steel fittings.

Boston Tire Tread Co.—45 Stanhope St. Tire treads.

Boston Varnish Co.—Everett Sta. Varnishes.

Brewer, Elias—42 Sudbury St. Elevators for garages.

Car, F. S.—75 Pearl St. Curtain fasteners, leather, artificial leathers, rubber cloth, and cloth and carpet trimmings.

Albert Champion Co.—36 Whittier St. Magneto, spark plugs, coils.

Chapman Ball Bearing Co.—40 Bristol St. Ball bearings.

Chelsea Clock Co—16 State St. Auto clocks.

Chesterton & Co., A. W.—64 India St. Oils and packing.

Clark, Ed. S.—242 Freeport St. Automobile parts, marine motors.

Clark Insulation Co., The—186 Freeport St. Insulated wire.

Codman & Shurtleff, Inc.—120 Boylston St. Tire pumps, oil pumps, nipples.

Coglan Co., J. W.—Sudbury Bldg. Monograms.

Consolidated Rubber Tire Co.—11-13 Hawkins St. Tires.

Continental Caoutchouc Co.—735 Boylston St. Tires.

Coops Co., C. W.—3 Appleton St. Auto seats, top fixtures, metal trimmings.

Cramps, James—85 Summer St. E. Steel rims.

Crosby Steam Gauge & Valve Co.—97 Oliver St. Pressure gauges and safety valves.

Curry Oil & Supply Co. Oil.

Dalton, Ingersoll Co.—Pipe and brass fittings.

Davis, S. H., & Co.—68 Portland St. Speedometers.

Defiance Chain Co., The—143 Federal St. Tire chains.

Diamond Rubber Co.—174 Columbus Ave. Tires.

Dinner, Isaac H., Co.—78 Bedford St. Caps.

Dodge Lubricator Co.—8 Waltham St. Lubricators, timers.

Downing Grease Co.—14 Waltham St. Grease.

Eagle Oil & Supply Co.—104 Broad St. Grease, oils, packing.

Eastern Electric Cable Co.—61-63 Hampshire St. Insulated wire.

Eastern Forge Co.—70 Kilby St. Drop forgings.

MASSACHUSETTS—Boston (Cont.)

Eco. Mfg. Co.—53 State St. Storage tanks, and generators, combine acetylene torch, lamps, cabin lamps, searchlight, brackets.
 Elastic Tire Filling Company—52 Church St. Tire filling.
 Electric Storage Battery Co.—60 State St. Sales office.
 Elliott & Co., W. J.—185 Franklin St. Tire irons.
 Emond, J. P. & W. H.—474 Parker St. Wood and metallic bodies.
 Empire Automobile Tire Co.—292 Devonshire St. Tires.
 Eneas, A. G.—50 Congress St. Storm aprons, and curtains.
 Enterprise Rubber Co.—110 Federal St. Tire patches, tire plugs, miscellaneous wearing apparel.
 Evans Mfg. Co.—118 N. Brookline St. Bow separators, top fixtures.
 Firestone Tire & Rubber Co.—9 Park Square. Tires.
 Fisk Rubber Co.—239 Columbus Ave. Tires.
 Flash Chemical Specialty Co.—7-9 Fulton Pl. Auto body soaps.
 Fuller & Sullivan—19 Elliott St. Miscellaneous wearing apparel.
 Gilmore Electric Co.—625 First St. Electric motors.
 Globe Optical Co.—403 Washington St. Eye shields.
 Goodrich Co., B. F.—161 Columbus Ave.
 Goodyear Tire & Rubber Co.—Cor. Dartmouth and Boylston Sts. Tires.
 Gray & Sons, Peter—90 Union St. Tool boxes, dashes and fenders, gasoline funnels, acetylene generators, lamps.
 Grant Gear Works—6 Portland St. Sprockets.
 Hamline Emery Brass Co. Pipe and brass fittings.
 Hammond Wrench Co.—26-30 Atlantic Ave. Wrenches.
 Hartford Mfg. Co.—370 Atlantic Ave. Trunk racks.
 Hatch Accumulator Co.—Charlestown. Storage batteries.
 Heywood Bros. & Wakefield Co.—174 Portland St. Hammers.
 Hill, Clark & Co. 156 Oliver St. Special automobile machinery.
 Hill Co., Geo. Q.—326 A St. Screw machine products, machine works to order, screws, stampings.
 Hillman Plating Co.—446 Tremont St. Monograms, brass and nickel plating robe rails, tire holders, foot rests.
 Hinds & Coon—126 Pearl St. Metal polishes.
 Hoeffcker Co., The—Motor Mart, Park Square. Speedometers.

MASSACHUSETTS—Boston (Cont.)

Hollis, Park & Pollard—28-30 Canal St. Portable houses.
 Hoyt Elevator Co.—129 Pearl St. Drop forgings.
 Hub Lubricating Co.—Portland Bldg. Spark plugs.
 Hydro-Palm Soap Co.—22 Minot St. Automobile soaps.
 Ideal Plating Co.—3 Appleton St. Brass and nickle plating.
 Iidium Metals Co.—Sparking points.
 Jenkins & Co., W. M.—286 Columbus Ave. (Mitchell.)
 Johnson Sporting Goods Co., Iver—163-165 Washington St. Gasoline funnels, tire chains.
 Kimball Co., E. T.—Motor Mart. Acetylene generators.
 Knowles, C. S.—7 Arch St. Collapsible buckets.
 Lapointe Machine Tool Co. Special automobile machinery.
 Leavitt, Gilbert—11 India St. Metal polishes.
 Littlefield Mfg. Co.—134 Eliot St. Speed indicators.
 Lloyd, A. J. & Co.—323 Washington St. Eye shields.
 Maclean-Brandown Oil & Supply Co.—65 Long Wharf. Oils.
 Macullar-Parker Co. Miscellaneous wearing apparel.
 Mason Regulator Co.—158 Summer St. Steam engines, pipe and brass fittings.
 Meisel Press Mfg. Co.—944-948 Dorchester Ave. Transmission gears, steering apparatus.
 Moore-Smith Co. Auto robes, miscellaneous wearing apparel.
 Morgan & Wright, Motor Mart. Tires.
 Motorcycle Specialty Co.—258 Columbus Ave. Combination stand and baggage carrier.
 Murdock-Shaw Co.—125 Federal St. Name plates.
 Murray & Tregurtha Co.—340 N. 1st St. Gasoline marine motors.
 Murry, W. T.—28 Beach St. Spark coil boxes, patterns.
 Mutty Co., L. J.—28 Summer St. Auto covers, artificial leathers, rubber cloth, cloth and carpet trimmings.
 National Brake & Clutch Co.—16 State St. Cork inserts, clutches, pulleys, friction devices.
 National Casket Co. Lap robes, rain coats, auto heaters.
 Nichols & Son, D. P.—116-122 West Brookline St. Wood and metallic bodies, auto tops.

MASSACHUSETTS—Boston (Cont.)

Nolan, Wm.—541 Tremont St. Auto trunks, trunk racks, auto tops, glass wind shields.
 No-Match Electric Mfg. Co.—141 Milk St. Gas lamp burners.
 North Carolina Mica Co.—95 Blackstone St. Eye shields, mica.
 Oakes Dow Co.—15 Chardon St. Spark plugs.
 Old Colony Light Co.—Motor Mart. Acetylene tanks.
 Orient Mfg. Co.—537 Albany St. Washing apparatus.
 Orswell Ignition Co.—102 Pearl St. Spark plugs.
 Parker Mfg. Co.—6 Clifton St. Speedometers.
 Pennsylvania Rubber Co.—20 Park Square. Tires.
 Prest-O-Lite Co.—607 Boylston St. Gas tanks, tire filling tanks.
 Prosser & Son, Thos.—185 Summer St. Steel (Chrome-Nickel.)
 Quinsler & Co.—26-30 Cambria St. Wood and metallic bodies.
 Randall-Faichney Co. Oil guns.
 Republic Rubber Co.—139 Congress St. Tires.
 Robbins Mfg. Co., John—58 Kneeland St. License numbers, name plates, steel stamps and stencils.
 Rogers, C. E.—34 Beach St. Name plates.
 Sage's Trunk Depot. Auto trunks.
 Salman & Co., John A.—17 Bromfield St. Monograms.
 Scherer, Williams Co.—30 Lewis Wharf. Hampers.
 Shaw, Ora D.—109 Kingston St. Caps.
 Shuman, A. & Co. Miscellaneous wearing apparel.
 Simplex Electrical Co.—110 State St. Ignition wires.
 Solderine Co.—53 State St. Stick and paste.
 Spear's Sons & Co., Alden, The—369 Atlantic Ave. Oils, greases, soaps, metal polishes.
 Standard Brazing Co.—88 Broad St. Brazing compound.
 Star Brass Mfg. Co.—108-114 Dedham St. Oil cups, oil pumps, stampings, safety valves.
 Sturgis, E. A.—179 Summers St. Monograms.
 Sturtevant Mill Co.—Harrison Sq. Brakes, clutches, transmission gears, lubricators, gasoline, auto-motors.
 Tool Steel Castings Co.—90 Canal St. Steel castings.
 Underhay Oil Co.—275 Franklin St. Oils.
 United States Fastener Co.—95 Milk St. Curtain fasteners.

MASSACHUSETTS—Boston (Cont.)

Walworth Mfg. Co.—128-136 Federal St. Tools, auto-stillson wrenches.
 Ward, Edgar T., & Sons. Steel tubing, wire-springs.
 Webster Mfg. Co.—Keany Sq. Bldg. Gasoline tank gauges.
 Whitcher & Co., Frank W.—14 Albany St. Leather, artificial leather.
 Winship, W. W.—71 Summer St. and 11 Kingston St. Trunks, lunch trunks, ice and wine trunks, lunch baskets, robes, leather pockets.
Publications.
 Hub, The.
Repairing, Automobile.
 Barry Co., J. M.—343 Tremont St. Garage (second-hand cars.)
 Burmester Rubber Co.—83 Church St.
 Dunham, G. J.—182-188 Columbus Ave. (Royal.)
 Locomobile Co.—Neubury St. (Branch Locomobile Co. of America.) Garage.
 Lowe Co., Geo. H.—509 Tremont St. (American Mors, Aerocar.) Garage.
 Maxwell-Briscoe Boston Co.—121 Massachusetts Ave. (Maxwell.)
 Metropolitan Automobile Co.—57-61 Stanhope St. (Moon.) Garage.
 Northern Automobile Agency—Park Square, 7 Motor Mart. (Northern.)
 Park Square Auto Station—43 Columbus Ave. (Berliet, Stoddard-Dayton.) Garage.
 Pattinson Mfg. Co.—Rear, 48 Stanhope St. Garage.
 Peerless Motor Car Co. of N. E.—178 Columbus Ave. (Peerless.) Garage.
 Pennsylvania Auto Agency—7 Motor Mart, Park Square. (Pennsylvania, Pullman, Northern.)
 Pullman Auto Agency—7 Motor Mart, Park Square. (Pennsylvania, Pullman, Northern.)
 Stanhope Forge & Machine Works—27 Stanhope St.
Supplies, Automobile.
 Connell, W. J.—36 Columbus Ave.
 Dunne, D. W.—143 Federal St.
 Miller, Chas. E.—202-204 Columbus Ave. Manufacturers, jobbers, exporters and importers.

BOURNE—

Automobile Agents and Dealers.
 Nickerson, Ed. (Waltham.)

BRAINTREE—

Garages.
 Dow Portable Electric Co.—Adams St. Repairing.
Parts and Accessories Manufacturers.
 Dow Portable Electric Co. Spark coils.
Repairing, Automobile.
 Dow Portable Electric Co.—Adams St. Garage.

MASSACHUSETTS (Continued)

BRIGHTON—

Garages.

Brigham & Saunders—Commonwealth Ave. and Malvern St.
Brighton Garage—58 Murdock St.

BRIDGEWATER—

Automobile Agents and Dealers.

King, Chas. H., (Maxwell.)

BROCKTON—

Clubs and Associations.

Brockton Automobile Club—Edw. S. Bryant, Sec., 68 Main St.

Automobile Agents and Dealers.

Brockton Auto Exchange—51 Ward St. (Jackson, Rapid.)
Donahue, Geo. J.—389 Warren Ave. (Rambler, Pope-Waverley, National, Reo, White.)
Loring, Elmer—638 N. Main St. (Maxwell.)

Loring Motor Car Co., George J. Donahue. (Maxwell.)

Marble, W. H., Auto Garage—69 Main St. (Columbia, Locomobile, Cadillac, Knox, Winton.) Garage, repairing, supplies.

Automobile Manufacturers, Gasolene.

Cameron Car Co.

Garages.

Churchill & Co., F. E.—52 High St.
Marble, W. H., Auto Garage—69 Main St. (Columbia, Locomobile, Cadillac, Knox, Winton.) Repairing, supplies.

Miller, H. O.—101 Prospect St.

Motorcycle Manufacturers.

American Motor Co.

Parts and Accessories Manufacturers.

Stall and Deam Mfg. Co. Auto robes, miscellaneous wearing apparel.

Repairing, Automobile.

Marble, W. H., Auto Garage—69 Main St. (Columbia, Locomobile, Cadillac, Knox, Winton.) Garage, supplies.

Supplies, Automobile.

Marble, W. H., Auto Garage—69 Main St. (Columbia, Locomobile, Cadillac, Knox, Winton.) Garage.

BROOKLINE—

Garages.

Brookline Garage—50-60 Washington St.

Parts and Accessories Manufacturers.

Holtzer-Cabot Electric Co. Primary batteries, electric generators, dynamos, charging, magnetos, electric bells.

CAMBRIDGE—

Garages.

Harvard Automobile Co.—1230 Massachusetts Ave.

Harvard Marine & Auto Co.—25 Eliot St.

Tower, J. A.—Riverbank Court.

MASSACHUSETTS (Continued)

Parts and Accessories Manufacturers.

Boston Woven Hose & Rubber Co.—29 Hampshire St. Rubber mats, packing, tire tape, rubber tubing.

Dover Stamping & Mfg. Co.—385 Putnam Ave. Waste cans, dashes and fenders, drip pans, gasoline funnels, hoods, oil cans.

Gould Packing Co.—88 E. Cambridge St. Packing.

Harvard Marine & Auto Co.—25 Eliot St. Gasoline auto motors, gasoline marine motors.

Hopewell Bros.—42 Osborn St. Tire cases, tool rolls, automobile fabric goods, robes.

Lora Polish Co., F. T. Metal polishes.

Monitor Speed Recorder Co.—274 Pearl St. Timers, speedometers.

Morris Mfg. Co.—27 Western Ave. Feed water heaters.

Waugh & Co., Chas.—856-864 Main St. Auto tops.

Repairing, Automobile.

Blanchard Mch. Co.—64 State St.

CAMBRIDGEPORT—

Parts and Accessories Manufacturers.

Hugh Stewart & Co.—414 Main St. Wood and metallic bodies, auto tops.

CAMPELLO—

Garages.

Belcher, A. S.—Market St.

CANTON—

Parts and Accessories Manufacturers.

Draper Bros. & Co. Auto robes.

CHICOPEE FALLS—

Automobile Manufacturers, Gasolene.

Stevens-Duryea Co.

Automobile Manufacturers, Gasolene Commercial.

Stevens-Duryea Co.

Parts and Accessories Manufacturers.

Fisk Rubber Co., The—Oak St. Auto tires.

Oil Tempering Spring Co. Shock absorbers.

CONCORD—

Automobile Agents and Dealers.

Keyes, John M.—8 Walden St. (Pope-Toledo, Stanley.) Garage, repairing.

Garages.

Hancock, W. C.

Keyes, John M.—8 Walden St. Pope-Toledo, Stanley.) Repairing.

Repairing, Automobile.

Keyes, John M.—8 Walden St. Pope-Toledo, Stanley.) Garage.

DALTON—

Parts and Accessories Manufacturers.

Pittsfield Spark Coil Co. Magnetos and ignition dynamos, spark plugs, timers, electric switches, electric lock switches, wire terminals.

MASSACHUSETTS (Continued)
DORCHESTER—
Garages.
 Crane & Brewster—243 Talbot Ave.
DOVER—
Parts and Accessories Manufacturers.
 Hodgson, E. F. Portable houses.
EAST BOSTON—
Automobile Manufacturers, Gasolene.
 Holmes Vehicle Co.
EAST HAMPTON—
Parts and Accessories Manufacturers.
 Barnett Drop Forging Co. Drop forgings.
EAST TAUNTON—
Parts and Accessories Manufacturers.
 Chandler Oil Cloth & Buckram Co.
 Cloth and carpet trimmings.
EAST WEYMOUTH—
Garages.
 Pratt, C. B.—105 Grant St.
EVERETT—
Parts and Accessories Manufacturers.
 Milne, Frank. Body irons, steering apparatus.
FALL RIVER—
Automobile Agents and Dealers.
 Fall River Auto Co.—345 Durfee St. (Stanley.)
 Johnson, John E.—Central St. (Cadillac.)
 Newton, J. E.—Bedford and Troy Sts. (Stevens-Duryea.)
 Peck & White—Cinawan St. (Pope.)
 Sterling Mfg. Co. (Locomobile.)
 Wilcox, Wallace L.—Central St. (Franklin.)
 Williams, John—464 Pleasant St. (Reo.)
Garages.
 Central Garage.—Durfee St., Opp. Armory. Repairing, supplies.
Repairing, Automobile.
 Central Garage—Durfee St., Opp. Armory. Supplies, garage.
Supplies, Automobile.
 Central Garage—Durfee St., Opp. Armory. Garage, repairing.
Parts and Accessories Manufacturers.
 Belcher Motor Co. Gasoline marine motors.
 McClellan, Chas. P. Auto tops.
 Sterling Engine Co. Auto motors, marine motors.
FALMOUTH—
Automobile Agents and Dealers.
 Crocker Cycle Co. (Cadillac.)
FITCHBURG—
Clubs and Associations.
 Wauchusett Automobile Club of Fitchburg—L. H. Greenwood, Sec., Gardner, Mass.
Automobile Agents and Dealers.
 Stevens Co., E. A.—Rear Fitchburg Hotel, Main St. (Glide.) Garage, repairing.

MASSACHUSETTS (Continued)
 Willow St. Motor Car Repair Co.—Willow St. (Rambler.)
 Yale, Wm. A. (Waltham.)
Garages.
 Fitchburg Auto Transit Co.
 Stevens Co., E. A.—Rear Fitchburg Hotel, Main St. (Glide.) Repairing.
Parts and Accessories Manufacturers.
 Fitchburg Machine Works. Special automobile machinery.
Repairing, Automobile.
 Stevens Co., E. A.—Rear Fitchburg Hotel, Main St. (Glide.) Garage.
FOXBORO—
Garages.
 Hedges Cycle Co.—Main St.
Parts and Accessories Manufacturers.
 American Coil Co., Inc.—Cor. Wall and Cocasset Sts. Spark plugs, coil timers, ammeters, and lock switches.
 Schaeffer & Budenburg Mfg. Co. Pressure gauges, feed pressure air, gasoline, tachometers, indicators, for gas engines.
FRAMINGHAM—
Garages.
 Eastman, H. D.
GARDNER—
Clubs and Associations.
 Wachusett Automobile Club.
Automobile Agents and Dealers.
 Barrow & Co., H. A. (Northern.)
 Greenwood Bros & Co. (Knox.)
 Parcher, L. Herbert. (Maxwell.)
 Parker, F. H. (Maxwell.)
Garages.
 Hadley, Henry.
 Pierce, S. K.
 Smith, L. H.
GLOUCESTER—
Automobile Agents and Dealers.
 Perkins & Corliss—65 Middle St. (Maxwell, Rambler.) Repairs, supplies.
 Stoddard & Co., A. P. (Mitchell.)
Garages.
 Clancy, J. F.—Western Ave.
 Hodgkins, W.—9 Western Ave.
Motor Boat Manufacturers.
 Perkins Launch & Motor Co.
Parts and Accessories Manufacturers.
 Boyntons Improved Pioneer Oil Clothing Co.—Vincent St. Miscellaneous wearing apparel.
 Wilkinson, J. Franklin, Inventor. Foot-lever.
Repairing, Automobile.
 Perkins & Corliss—65 Middle St. (Maxwell, Rambler.) Supplies.
Supplies, Automobile.
 Perkins & Corliss—65 Middle St. (Maxwell, Rambler.) Repairs.
GREAT BARRINGTON—
Garages.
 Dunham, M. H.

MASSACHUSETTS (Continued)

Easland, John N.—Main St., Nr. Berkshire Inn. Repairs, supplies.

Taylor, Chas. S.

Repairing, Automobile.

Easland, John N. Main St., Nr. Berkshire Inn. Garage, supplies.

Supplies, Automobile.

Easland, John N.—Main St., Nr. Berkshire Inn. Garage, repairs.

GREENFIELD—

Automobile Agents and Dealers.

Greenfield Automobile Co.—21 Federal St. (Rambler, Ford.) Repairs, supplies.

Garages.

Greenfield Automobile Co.—21 Federal St. (Rambler, Ford.) Repairs, supplies.

Parts and Accessories Manufacturers.

Goodell-Pratt Co. Tools.

Write, Geo. H. Morgan & Wright tires.

Repairing, Automobile.

Greenfield Automobile Co.—21 Federal St. (Rambler, Ford.) Garage, garage.

Supplies, Automobile.

Greenfield Automobile Co.—21 Federal St. (Rambler, Ford.) Garage, repairs.

HAVERHILL—

Automobile Agents and Dealers.

Arnold, L. N. (Premier.)

Hill Motor Car Co. (Maxwell.) Garage.

Lowell Automobile Co.—Appleton St. and Post Office Ave. (Stevens-Duryea, Cadillac, Pope-Hartford, Stanley.) Garage, repairing, supplies.

Seavey Bros.—50 Emerson St. (Lambert.)

Automobile Manufacturers, Gasoline.

Hill Motor Car Co.

Garages.

Hill Motor Car Co. (Maxwell.)

Lowell Automobile Co.—Appleton St. and Post Office Ave. (Stevens-Duryea, Cadillac, Pope-Hartford, Stanley.) Repairing, supplies.

Pentuckert Garage Co.—Central St., Bradford Dist.

Parts and Accessories Manufacturers.

Haverhill Fire Appliance Co.—40 Merrimack St., factory Island Park. Fire extinguishers.

Repairing, Automobile.

Lowell Automobile Co.—Appleton St. and Post Office Ave. (Stevens-Duryea, Cadillac, Pope-Hartford, Stanley.) Supplies, garage.

Supplies, Automobile.

Lowell Automobile Co.—Appleton St. and Post Office Ave. (Stevens-Duryea, Cadillac, Pope-Hartford, Stanley.) Garage, repairing.

MASSACHUSETTS (Continued)

HOLYOKE—

Automobile Agents and Dealers.

Burrington Motor Co.—24 Suffolk St. (Maxwell.)

Carson & Co., H. C. (Knox.)

Dunbar & Mansir.—302 High St. (Elmore.)

Holyoke Auto Garage—Division St. (Knox.)

Magna Garage. (Buick, Stevens-Duryea.)

Parts and Accessories Manufacturers.

Barlow Mfg. Co. Robe rails, metal trimmings.

Houle Motor Works, A. J. Gray iron castings, gasoline auto motors, gasoline marine motors.

Manning Mfg. Co. Tire shoes.

HUBBARDSON—

Parts and Accessories Manufacturers.

Biko Mfg. Co. Tire fluid.

HAYDENVILLE—

Parts and Accessories Manufacturers.

Haydenville Co. Pipe, brass fittings.

HYDE PARK—

Parts and Accessories Manufacturers.

American Brass Foundry Co. Brass, bronze, aluminum and copper castings.

Becker-Brainard Milling Machine Co.—110 Business St. Milling machines, milling cutters, automobile gear cutters.

Becker, John. Vaporizers.

New England Steel Castings Co. Steel castings.

JAMAICA PLAINS—

Automobile Manufacturers, Gasoline.

Napier Motor Car Co. of America.

Parts and Accessories Manufacturers.

Blake Steam Pump Co.—356 Arborway. Condensers.

John C. Meyer & Co.—Boylston and Bismarck Sts. Taper pins.

LAWRENCE—

Automobile Agents and Dealers.

Eidam, Dr. C. H. (Jackson.)

Ellis, Fred—Methuen St. (Pope-Hartford.)

Frank, Chas. A. (Compound.)

O'Neil's Auto Station—574 Common St. (Premier, Ford.) Garage, repairing.

Garages.

Broadway Motor Car Co.—174 Broadway.

O'Neil's Auto Station—574 Common St. (Premier, Ford.) Repairing.

Parts and Accessories Manufacturers.

Archibald Wheel Co. Wood wheels.

Repairing, Automobile.

O'Neil's Auto Station—574 Common St. (Premier, Ford.) Garage.

MASSACHUSETTS (Continued)
SOUTH BRIDGE—
Garages.
 Richards & Simmonds—Main and Elm Sts.
SOUTH EASTON—
Automobile Manufacturers, Gasolene.
 Easton Machine Co.
SOUTH EGREMONT—
Parts and Accessories Manufacturers.
 Dalzell Axle Co. Axles.
SOUTH FRAMINGHAM—
Garages.
 Whyte Auto Station, C. F.—109 Waverly St.
Parts and Accessories Manufacturers.
 Eames & Co., A. M. Wood wheels.
SPRINGFIELD—
Clubs and Associations.
 Automobile Club of Springfield—J. W. Norcross, Sec., 122 Bridge St.
Automobile Agents and Dealers.
 Castle, H. C. & C. D.—19 Lyman St. (Lozier.)
 Clark Automobile Co., E. R.—461 Worthington St. (Cadillac.) Garage.
 Corson, Myron L. (Mitchell.)
 Geisel Automobile Co.—36 Dwight St. (Winton.)
 Hampden Auto Co.—60 Main St. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)
 Hass Electric & Mfg. Co., R. (De Luxe, Kissel-Kar.)
 Hubbel Co., E. G.—492 Main St. (Crawford.)
 Knox Automobile Co. (Knox.)
 Mayer, Rudolph—151 Main St. (Auto-car, Lambert.)
 Nelson Auto Co.—214 Main St. (Buick.)
 Norcross-Cameron Co.—57-61 Bridge St. (Rambler.) Garage, supplies.
 Shean Auto Co.—640 Main St. (Oldsmobile, American, Mercedes.)
 Springfield Automobile Co.—40 Liberty St. (Locomobile, Franklin, Stevens-Duryea.) Garage.
 Tierney, S. P.—147 Main St. (Cameron.)
 White, Jr., A. Corydon.—640 Main St. (White, Stanley.)
 White, M. T.—74 Bridge St. (Maxwell.)
 Woodward & Reopell—18-20 Fort St. (Stoddard-Dayton.) Garage, repairing.
Automobile Manufacturers, Gasolene.
 Atlas Motor Car Co.
 Knox Automobile Co.
 Med-Bow Auto Co.
 Sultan Motor Co.

MASSACHUSETTS (Continued)
Automobile Manufacturers, Gasolene Commercial.
 Atlas Motor Car Co.
 Knox Motor Truck Co.—Birnie Ave.
Garages.
 Clark Automobile Co., E. R.—461 Worthington St. (Cadillac.)
 Fowler, Frank.
 Norcross-Cameron Co.—57-61 Bridge St. (Rambler.) Supplies.
 Sheehan's Garage—12 Stockbridge St.
 Springfield Automobile Co.—40 Liberty St. (Locomobile, Franklin, Stevens-Duryea.)
 Woodward & Reopell—18-20 Fort St. (Stoddard-Dayton.) Repairing.
Motorcycle Agents and Dealers.
 Holder, George N.—17 Dwight St. (Indian.)
Motorcycle Manufacturers.
 Hendee Mfg. Co.
 Warwick Cycle & Auto Co.
Parts and Accessories Manufacturers.
 Bausch Machine Tool Co.—Wason Ave. Universal joints.
 Bullard, J. H.—777 State St. Speedometers, speed recorders.
 Burgin Bros. Auto covers, tire cases.
 Chandler Co., The—31 Taylor St. Monograms, name plates, license numbers, hub caps, radiators, stampings.
 Chapman & Co., J. B.—51 Taylor St. Bronze metals.
 Duckworth Chain & Mfg. Co. Chains.
 Eldredge Electric Mfg. Co.—7 Post Office Square. Ammeters and voltmeters, electric switches.
 Ericka Mfg. Co., Inc. Hand soaps.
 Fisk Mfg. Co.—Walker St. Auto body soaps.
 Fisk Rubber Co.—135 Bridge St. Tires.
 Hercules Float Works—200 Franklin St. Brass, bronze, composition and aluminum castings, floats.
 Moore Drop Forging Co. Drop forgings, wrenches.
 Park City Brass Co. Tire valve pump connections, nipples.
 Parker, E. N. Nipples.
 Putnam Motor Mfg. Co.—57 Lebanon St. Motors for motorcycles, automobiles and marine carbureters.
 Smith Mfg. Co., The R. H. Name plates, speedometers, steel stamps and stencils.
 Springfield Auto Top & Upholstering Co.—102-106 Dwight St. Bow separators, cushions, auto tops.
 Springfield Hat & Cap Co.—27-35 Taylor St. Caps.
 Springfield Metal Body Co.—Birney Ave. Aluminum bodies, hoods and fenders, auto tops.

MASSACHUSETTS (Continued)

Springfield Portable Const. Co. Portable houses.

Stebbins Mfg. Co., E. Pipe, brass fittings.

Universal Tool Co.—54 Taylor St. Tools.

West Box Co., F. M.—225 Liberty St. Battery boxes, spark coil boxes, tool boxes.

Repairing, Automobile.

Woodward & Reopell—18-20 Fort St. (Stoddard-Dayton.) Garage.

Supplies, Automobile.

Norcross-Cameron Co.—57-61 Bridge St. (Rambler.) Garage.

STOCKBRIDGE—

Automobile Agents and Dealers.

Morrissey's Automobile Sta.—Pine and Shamrock Sts. (Rambler.)

Garages.

Parsons, Henry B.—Pine St. Repairing.

Repairing, Automobile.

Parsons, Henry B.—Pine St. Garage.

STONEHAM—

Automobile Manufacturers, Gasolene.

Shawmut Motor Co.—1091 Boylston St.

Garages.

Shawmut Motor Co.—1091 Boylston St.

Tierney & Stantial Co., S. P.

Motorcycle Manufacturers.

Crouch Motor Co.

STOUGHTON—

Automobile Agents and Dealers.

Lehan, James. (Pope-Hartford.)

SWAMPSCOTT—

Garages.

Kings Beach Garage.

Swampscott Auto Co.

Motor Boat Manufacturers.

Emmons Co., E. Gerry.

TAUNTON—

Automobile Agents and Dealers.

Brownell & Burt—Washington St. (Lambert.)

Carlow Automobile Co.—51-59 Weir St. (Winton, Buick.) Garage, repairing, supplies.

McDonald, Ed. (Reo.)

Peck & White—Weir St. (Pope-Hartford, Pope-Toledo.)

Pierce Hardware Co., The. (Waltham.)

Perry, F. W.—21 Court St. (Maxwell.)

Robertson, J. W. (Elmore, Cadillac.)

Garages.

Carlow Automobile Co.—51-59 Weir St. (Winton, Buick.) Repairs, supplies.

Parts and Accessories Manufacturers.

Easternhouse Engine Co. Marine motors.

Taunton Motor Carriage Co. Gasoline and kerosene burners.

MASSACHUSETTS (Continued)

Taunton-New Bedford Copper Co. Sheet and rod brass, and copper.

Repairing, Automobile.

Carlow Automobile Co.—51-59 Weir St. (Winton, Buick.) Garage, supplies.

Supplies, Automobile.

Carlow Automobile Co.—51-59 Weir St. (Buick, Winton.) Garage, repairing.

TOWNSEND—

Repairing, Automobile.

Packard, Chas. A.

WALPOLE—

Parts and Accessories Manufacturers.

Massachusetts Chemical Co. Insulating paints and varnishes, friction tape, rubber goods.

WALTHAM—

Automobile Manufacturers, Gasolene.

Waltham Mfg. Co.

Automobile Manufacturers, Gasolene Commercial.

Waltham Mfg. Co.

Garages.

White, J. Bartlett.

Motorcycle Manufacturers.

Metz, C. H.

Waltham Mfg. Co.

Parts and Accessories Manufacturers.

Waltham Brass and Aluminum Co. Brass, bronze, aluminum and copper castings.

Repairing, Automobile.

Watch City Auto Garage—Rear Park Theatre, Elm St.

WARE—

Garages.

Ruggles, F. A.

Youlden, Geo. A.

WARREN—

Parts and Accessories Manufacturers.

Warren Mfg. Co. Auto motors.

WATERTOWN—

Automobile Agents and Dealers.

New Era Co.—56 Galen St. (Glide.)
Roemer, Emil—29-31 School St. (Maxwell.)

Parts and Accessories Manufacturers.

Non-Corrosive Metal Works, Inc. Top fixtures, metal trimmings.

WELLESLEY HILLS—

Garages.

Whitney Bros.

WEST BARNSTABLE—

Automobile Agents and Dealers.

Barnstable Motor Car Co. (Atlas.)

West Barnstable Motor Co. (Logan, Commercial.)

WEST EVERETT—

Parts and Accessories Manufacturers.

Massachusetts Steel Casting Co. Steel castings.

MASSACHUSETTS (Continued)

WESTFIELD—

Automobile Agents and Dealers.

Gilman Distributing Agency, M. A. (Haynes.)

Hampden Auto Co.—60 Main St. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Garages.

Westfield Auto Sta.—95 Elm St.

Parts and Accessories Manufacturers.

Loomis Autocar Co. Carburetters, mufflers.

Moor & Son, M. E. Generators.

WEST NEWTON—

Garages.

West End Auto Garage Co.—1435 Washington St.

WEST SOMERVILLE—

Automobile Agents and Dealers.

Somerville Auto Co.—Boston Ave. and Broadway. (Rambler.)

WHITMAN—

Garages.

Pearson, W.

WINCHENDON—

Automobile Agents and Dealers.

Andrews, Chas. A. (Jackson, American Mercedes.)

Garages.

Winchendon Auto Transit Co.

WINCHESTER—

Garages.

Carll Automobile Co.

Winchester Automobile Co.

WINTHROP—

Automobile Agents and Dealers.

Pilling, A. J.—Locust St. and Beach Rd. (Waltham.)

WORCESTER—

Clubs and Associations.

Worcester Automobile Club—F. E. Frost, Sec., 44 Front St.

Automobile Agents and Dealers.

Billings, Frank. (Knox.)

Brunnell Auto Co.—38 Exchange St. (Jackson.)

Frost, F. E.—505 Main St. (Pierce-Racine.)

Harrington, J. S.—36 Central St. (Thomas Flyer.)

Lemont Motor Car Co. 6 Tirrell St. (Buick.)

Norcross Auto Co.—43 Foster St. (Buick.)

Palace Automobile Station—32 Hermon St. (Rambler.) Repairing.

Pilot Garage & Supply Co.—185 Commercial St. (Pope-Hartford, Pope-Toledo.)

Pond Machine & Foundry Co.—186 Main St. (Premier, Reo, Maxwell, Ford, Pope-Waverley, Mercedes.)

Robinson's Auto Station—Pleasant St., Opp. Chestnut. (Cadillac.) Garage.

MASSACHUSETTS (Continued)

Garages.

Dawson Machine Co.—2 Sargent St. Harrington Garage. Supplies.

Paige Electric Co.—238 Main St.

Palace Automobile Station—32 Hermon St. (Rambler.) Repairing.

Robinson's Auto Station—Pleasant St., Opp. Chestnut. (Elmore, Cadillac.)

Stowe, Geo.—203 Commercial St.

Motorcycle Agents and Dealers.

Clark, Geo. F.—660 Main St. (Indian.)

Motorcycle Manufacturers.

Royal Motor Works—30 Russell St.

Parts and Accessories Manufacturers.

Adams, A. L.—45 Salem St. Hydrometers.

Arcade Malleable Iron Co.—Malleable iron castings and steel castings.

Baldwin Chain & Mfg. Co.—199 Chandler St. Chains, sprockets.

Bay State Stamping Co.—380 Chandler St. Oil cups, oil whole covers, sheet metal stampings.

Boston Pressed Metal Co.—171-173 Union St. Ball retainers, brake bands, cups and cones, drop forgings, hub caps, hub flanges, pressed steel products, stampings.

Boynton & Plummer. Forge equipment.

Burnham Co., Geo., The. Tools.

Coates-Clipper Mfg. Co. Buffing machines, drilling, flexible machines, flexible shafting, turn tables, universal joints.

Coes Wrench Co. Wrenches.

Cranska Thread Co., The. Top and upholstering thread.

Critchley Machine Screw Co.—25 Union St. Ball bearings, screws.

Heald Mach. Co. Special automobile machinery.

Houghton, Buxton. Cups and cones.

Kelley & Co., E.—509 Main St. Seat springs.

Leland & Co., W. H.—Southbridge St. and Hope Ave. Crank shafts, special automobile machinery.

Morgan Spring Co. Machinery springs.

New England Forge Co.—9 Plymouth St. Crank shafts, gear blanks.

Norton Grinding Co. Crank shafts, special automobile machinery.

Reed Co., Frances—43 Hammond St. Special automobile machinery.

Russel, H. J.—32 Exchange St. Auto tops.

Wakefield, J. E.—89 Exchange St. Wrenches.

Walden Mfg. Co.—65 Beacon St. Wrenches.

Warren Leather Goods Co. Auto trunks.

White & Bagley Co., The.—100 Foster St. Oils, auto body and hand soaps.

MASSACHUSETTS (Continued)

Worcester Machine Screw Co. Bolts and nuts, screw machine products.
 Worcester Pressed Steel Co.—Cor. North and Barber Aves. Fittings, brake drums, ball cups, dust caps, clusters, brackets, heads, braces, flanges.
 Wyman & Gordon—30 Bradley St. Connecting rods, crank shafts, drop forgings.
Repairing, Automobile.
 Palace Automobile Station—32 Hermon St. (Rambler.) Garage.
Supplies, Automobile.
 Harrington's Garage.
Vulcanizing.
 Alsten & Goulding—36 Foster St.

MICHIGAN

ADRIAN—

Automobile Manufacturers, Gasolene.
 Page Gas Engine Co.
Parts and Accessories Manufacturers.
 Adrian Steel Casting Co.—Beecher St. Steel castings.

ALBION—

Automobile Agents and Dealers.
 Orient Buckboard Supply Co.—110 Park St. (Waltham.)
 Osborn, C. H.—405 S. Superior St. (Rambler, Waltham, Queen.)
Parts and Accessories.
 National Spring & Wire Co. Frames, cushion springs.

ALPENA—

Automobile Agents and Dealers.
 Atland, M. J. (Cadillac, Northern.)
 Hanson, A. (Maxwell.)
 Steels, I. F. (Cadillac.)

ANN ARBOR—

Automobile Agents and Dealers.
 Lydon, A. S. (Dragon.)
 McCluce, A. W. (Maxwell.)

BATTLE CREEK—

Automobile Agents and Dealers.
 American Motor & Cycle Co.—35 E. Main St. (Buick, Franklin.)
 Gilbert, Chas.—174 Calhoun St. (Ford.)
 Palmer, Frank—40-50 Jefferson Ave., N. (Reo.) Repairing, supplies, garage.
 Schell, O. E. (Aerocar.)
Garages.
 Palmer, Frank—40-50 Jefferson Ave., N. (Reo.) Repairing, supplies.
Parts and Accessories Manufacturers.
 American Steam Pump Co. Air compressors, fuel, air pumps, boiler pumps.
 Bown Machine Works. Grease cups, special automobile machinery, tools.
 Union Steam Pump Co. Fuel air pumps, boiler pumps.
Repairing, Automobile.
 Palmer, Frank—40-50 Jefferson Ave., N. (Reo.) Garage, supplies.

MICHIGAN (Continued)

Supplies, Automobile.

Palmer, Frank—40-50 Jefferson Ave., N. (Reo.) Garage, repairing.

BAY CITY—

Automobile Agents and Dealers.

Bay City Auto Co.—1016 Saginaw St. (Cadillac.)
 Bousfield, C. J.—818 Farragut St. (Packard.) Garage.
 Buck Bros.—708 Garfield St. (Queen.)
 Chatfield, C. B.—1201 Center Ave. (Haynes.) Repairing.
 Coryell, Charles. (Mitchell.)
 Fenner, F. H.—The Ridotto, 1009 Washington St. (Jackson, Mitchell, Franklin.)
 Fraser, H. A.—1010 Broadway. (Waltham.)
 Freel & Trumpour—4th and Johnson Sts. (Ford.)
 Winidate & Vandenbrooks—Craps Bldgs. (Maxwell.)

Garages.

Bonsfield, C. J.—818 Farragut St. (Packard.)
 Chatfield, C. B.—1201 Center Ave. (Haynes.) Repairing.
 Handy, Robert—W. Midland St.
 Mobile Motor & Machine Co.—Jane St.

Motor Boat Manufacturers.

Brooks Boat Mfg. Co.
 De Foe Boat & Motor Works.

Parts and Accessories Manufacturers.

National Cycle Mfg. Co. Ball cups, cups and cones, machine works to order, oil pumps, screw machine products.
 Smalley Motor Co., Ltd. Marine motors.

Repairing, Automobile.

Chatfield, C. B.—1201 Center Ave. (Haynes.) Garage.

BENTON HARBOR—

Automobile Agents and Dealers.

Pioneer Automobile Co. (Franklin.)
 Newlin, W. G.—128 Pipestone Ave. (Rambler.)

Garages.

Benton Harbor Bicycle & Auto Works.

BIG RAPIDS—

Automobile Agents and Dealers.

Guirk, Wm. T. (Northern.)

BRIGHTON—

Automobile Agents and Dealers.

Sawyer, Floyd. (Waltham.)

BUCHANAN—

Parts and Accessories Manufacturers.

Lee & Porter Mfg. Co. Axles.

CADILLAC—

Automobile Agents and Dealers.

Haynes, C. E. (Elmore.)

MICHIGAN. (Continued)

CALUMET—

Automobile Agents and Dealers.

Pawler, P. (Wayne.)

Wieden Harness Co. (Maxwell.) Repairing.

Repairing, Automobile.

Wieder Harness Co. (Maxwell.)

CARSON CITY—

Automobile Agents and Dealers.

Hallett & Son, J. N. (Jackson.)

CEDAR RAPIDS—

Automobile Agents and Dealers.

Cedar Rapids Auto & Supply Co.—307 Third Ave. (Ford, Maxwell, Jackson, White.)

Faucett, C. E.—119-121 Third Ave. (National.)

CHARLOTTE—

Automobile Manufacturers, Gasolene.

Dolson Automobile Co.

Parts and Accessories Manufacturers.

Hancock Mfg. Co.—770 E. Henry St. Lubricators.

Repairing, Automobile.

Wildern, Geo. R.—Washington Ave.

COLDWATER—

Automobile Agents and Dealers.

Klinger, A. (Winton.)

Nettleton & Co., V. L.—21 Hanchett St. (Rambler, Maxwell.) Garage, repairing.

Nevell, C. H. (Waltham.)

Pratt, A. J. (Buick.)

Garages.

Nettleton & Co., V. L.—21 Hanchett St. (Rambler, Maxwell.) Repairing.

Parts and Accessories Manufacturers.

Regal Gasoline Engine Co. Marine motors.

Repairing, Automobile.

Nettleton & Co., V. L.—21 Hanchett St. (Rambler, Maxwell.) Garage.

CONCORD—

Automobile Agents and Dealers.

French, C. J. (Waltham.)

Reed & Johnson—109 W. Chicago St. (Reo.)

CONSTANTINE—

Automobile Manufacturers, Gasoline.

Hawley Automobile Co., Ltd.

Parts and Accessories Manufacturers.

American Carbolite Co. Carbide.

Constantine Mfg. Co. Magnetos and ignition dynamos.

Fawn River Mfg. Co. Magnetos and ignition dynamos.

DETROIT—

Clubs and Associations.

Automobile Club of Detroit—Garvin Denby, Sec., Pasadena Apartments.

Detroit Automobile Trade Association.

Motor Club of Detroit.

MICHIGAN—Detroit (Continued)

Automobile Agents and Dealers.

Beyster, Thorpe Co.—1329 Woodward Ave. (Aerocar.)

Blomstrom Motor Co. (Queen.)

Brady Auto Co., J. H.—234 Jefferson Ave. (Peerless, Pope-Hartford.)

Cadillac Motor Car Co.—265 Jefferson Ave. (Cadillac.) Repairing, garage.

Cole, S. W., & Roebke, Wm. (Reo.)

Detroit Automobile Top Co.—245 Jefferson Ave. (Winton.)

Fee-Bock Auto Co.—254 Jefferson Ave. (Elmore.)

Fee-Vincent Electric Car Co.—254 Jefferson Ave. (Woods.)

Ford Auto Co.—Jefferson Ave. (Ford.)

Grant Bros. Auto Co.—742 Woodward Ave. (Buick, Thomas Flyer.)

George, Edwin S. (Oldsmobile.)

Knox Automobile Agency, 31 McGraw Bldg. (Knox.)

Lutea, L. I.—239 Jefferson Ave. (Merkel.)

Maxwell-Briscoe-McLeod Co.—243 Jefferson Ave. (Maxwell, Mitchell.)

Motor Sales Co.—251 Jefferson Ave. (De Luxe, Queen.)

National Auto Co.—22-24 John R. St. (Detroit.)

Neuman & Co., Wm. F. V.—736 Woodward Ave. (Pope-Waverley, Welch, White, Soules, Baker, Rauch & Lang, Stoddard-Dayton.)

Reo Motor Car Co.—289 Jefferson Ave. (Reo.)

Schneider, J. P.—15-19 E. Jefferson Ave. (Columbia, Pierce Great Arrow, Pope-Toledo, Franklin, Stevens-Duryea.)

Seidler Miner Auto Co.—244 Jefferson Ave. (Jackson.)

Soules Welch Motor Car Co.—736 Woodward Ave. (Welch, Soules, Baker.)

Standard Auto Co.—750 Woodward Ave. (Packard, Oldsmobile.)

Standard Auto Co.—Woodward Ave., Cor. Alexandrine. (Packard, Oldsmobile.) Repairs, supplies.

Thomas Detroit Co., E. R.—Harper Ave. and Dequindre St. (Thomas.)

Weber, W. H. (Rambler.)

Wilson, Thos. H.—Detroit Club. (Stearns.)

Winton Motor Carriage Co., The—248-252 Jefferson Ave. (Winton.)

Automobile Manufacturers, Electric.

American Electromobile Co.

Automobile Manufacturers, Electric Commercial.

American Electromobile Co.

Automobile Manufacturers, Gasolene.

Aerocar Motor Car Co., The.

American Auto Vehicle Co.—254 Jefferson Ave.

MICHIGAN—Detroit (Continued)

Anderson Carriage Co.
 Blomstrom Mfg. Co., The.
 Blomstrom Motor Co., C. H.
 Brooks Motor Car Co.—508 Howard St.
 Brush Runabout Co.
 Cadillac Motor Car Co.
 Carter International Automobile Mfg. Co.
 De Luxe Motor Car Co.
 Fee Motor Car Co.
 Ford Motor Co.
 Kermath Motor Car Co.
 Motorcar Co., The.
 Neilson Motor Co.
 Northern Motor Car Co.
 Packard Motor Car Co.
 Pungs-Finch Auto & Gas. Eng. Co.
 Reliance Motor Car Co.
 Sommer Motor Co.—152 Congress St.
 Thomas Detroit Co., E. R.
 Wayne Automobile Co.
Automobile Manufacturers, Gasolene Commercial.
 American Machine Mfg. Co.—133-137 Beaubien St.
 Cadillac Motor Car Co.
 Fuller Co., The.
 Motor Car Co.
 Neilsen Motor Car Co.
 Northern Motor Car Co.
 Packard Motor Car Co.
 Reliance Motor Car Co.—67 E. Fort St.
 Simpson, Wm. G.—80 Broadway.
Automobile Manufacturers, Steam.
 Belknap Motor Car Co.
Garages.
 Annett's Garage—15-17 Harper St.
 Berg & Brehmer—238 Jefferson Ave.
 Cadillac Motor Car Co.—265 Jefferson Ave. (Cadillac.) Repairing.
 Central Auto Exchange—14 Alexandrine Ave., W.
 Chase & Nieson—936 Jefferson Ave.
 City Machine & Mfg. Co.
 Corston, C. H.—Jefferson Ave.
 Detroit Gas Engine & Machine Co.—Congress St.
 Edmunds & Jones Mfg. Co.—313 Riopelle St.
 Fisher, A.—310 Fort St. W.
 Henderson Bros.—Woodward Ave.
 McIntosh Auto Co., J. B.—199 Jefferson Ave.
 Michigan Auto Exchange.—Michigan Ave.
 Peters & Mulavey.
 Sanderson, Dr.—Woodward Ave and Witherell.
 Tegan Bros. & Snyder, 236 Jefferson Ave.
 Walker Motor Car Co.—109 Fort St.
 White, Co., The.
Motor Boat Manufacturers.
 Belle Isle Motor Co.

MICHIGAN—Detroit (Continued)

Michigan Steel Boat Co.—1252 Jefferson Ave.
 Pungs-Finch Co.
Motorcycle Agents and Dealers.
 Metzger, Wm. E.—252 Woodward Ave. (Indian.)
***Parts and Accessories Manufacturers.**
 Acme White Lead & Color Works.
 Paints, enamel and varnishes.
 American Blower Co. Forge equipment.
 American Carburetter Co.—907 Michigan Ave.
 American Injector Co. Grease cups, lubricators, oil cups, oil pumps.
 American Lamp Co.—255 Jefferson St.
 Acetylene generators, lamps.
 American Lubricator Co. Grease cups, lubricators, oil cups.
 Anderson Forge & Machine Co. Connecting rods, crank shafts, drop forgings.
 Auto Crank Shaft Co.—793-797 Gratiot Ave. Crank shafts.
 Automobile Equipment Co.—264 Jefferson Ave. Storm aprons and curtains, tire cement, horns, hydrometers, jacks, auto body soaps, auto tops.
 Berry Bros., Ltd. Enamel, paints, varnishes.
 Big 4 Spark Plug Co.—104 John R. St. Spark plugs.
 Briscoe Mfg. Co. Tool boxes, waste cans, dashes and fenders, hoods, mufflers, radiators, brass and copper tubing, tanks.
 Bryant & Berry Co.—34 W. Atwater St. Steering wheels.
 Buhl Malleable Iron Co. Malleable iron castings.
 Caille Bros. Co., The—Second Ave. and Amsterdam St. Marine motors.
 City Machine Co.—9-13 Orchard St. Axles, wood wheels.
 Clayton & Lambert Mfg. Co. Brass, bronze and aluminum castings, special bearing metal castings, gasoline fire pots and torches.
 Coleman, J. C.—234 Jefferson Ave. Steering wheels.
 Consolidated Rubber Tire Co.—294 Jefferson Ave. Tires.
 Continental Caoutchouc Co.—260 Jefferson Ave. Tires.
 Cross Engine Co., M. O.—800-806 Bellevue Ave. Carburetters, clutches, reverse marine gears, transmission gears, auto and marine motors.
 Detroit Auto Marine Co.—82 Congress St. Gasoline marine motors.
 Detroit Auto Specialty Co.—909-911 Greenwood Ave. Tool boxes, dashes and fenders, radiators, battery boxes.

MICHIGAN—Detroit (Continued)

Detroit Auto Specialty Co.—909-911 Greenwood Ave. Battery boxes.
 Detroit Auto Top Co. Auto tops.
 Detroit Cap Mfg. Co.—11-17 Wood-bridge St. Caps.
 Detroit Carriage Co.—Clay Ave. and St. Aubin Ave. Automobile bodies.
 Detroit Copper and Brass Rolling Mills. Sheet and rod brass and copper brass and copper metals, brass and copper tubing.
 Detroit Forging Co. Drop forgings.
 Detroit Leather Specialty Co. Gloves and gauntlets.
 Detroit Lubricator Co.—Trumbull and Lincoln Aves. G. T. Ry. Force feed oil pumps, lubricators, oilers.
 Detroit Motor Car Supply Co.—1250 Jefferson Ave. Storm aprons and curtains, wood and metallic bodies.
 Detroit Rubber Stamp Co.—99 Griswold St. Name Plates.
 Detroit Sanitary Supply Co. Brass, and pipe fittings.
 Detroit Screw Works—Riopelle and Franklin Sts. Set and cap screws, taper pins, studs, coupling bolts, nuts.
 Detroit Seamless Steel Tube Co.—833 River St. Axles, steel tubing.
 Detroit Steel Product Co.—91 E. Fort St. Motor car springs, drop forgings.
 Detroit Stoker & Foundry Co.—N. Grand Blvd and Riopelle St. Gray iron castings.
 Detroit White Lead Works—532 E. Milwaukee Ave. Colors and varnishes, enamels.
 Detroit Wire Spring Co.—295-305 Congress St., W. Automobile and carriage seat springs.
 Detroit Wrench Co.—Tolsma Bldg., 45 State St. Wrenches.
 Diamond Rubber Co.—258 Jefferson Ave. Tires.
 Dingfelder Motor Co. Marine motors.
 Ditzler Paint & Color Works.—14 Baltimore Ave. Paints, varnishes.
 Douglass & Lomason Co.—302-310 Grand River Ave. Brass handles, brackets, rails, hinges, catches, turnings, stamping, punching.
 Edmund & Jones.—315 Riopelle St. Searchlights, lamps, generators, whistles.
 Enterprise Foundry Co. Aluminum, brass, bronze and copper castings, gray iron castings.
 Essex Brass Co., G. B.—480 Franklin St. Lubricators, grease pumps, oil springs.

MICHIGAN—Detroit (Continued)

Everett, B. F. Dashes and fenders, auto tops, cloth and carpet trimmings.
 Firestone Tire and Rubber Co.—240-242 Jefferson Ave. Tires.
 Fisk Rubber Co.—262 Jefferson Ave. Tires.
 Galvin Co., J. F., The.—74-78 Fort St. E. Brass, bronze, aluminum and copper castings, gasoline strainers.
 Gies Gear Co.—345-347 Bellevue Ave. Marine reverse gears.
 Goodrich Co., B. F.—266 Jefferson Ave. Tires.
 Goodyear Tire and Rubber Co. Tires.
 Gramlich Chemical Co.—167 Leveret St. Metal polishes.
 Gray Hawley Mfg. Co.—605-609 Fort St., W. Automobile and marine mufflers, exhaust horns, muffler cut-outs, foot-pedals, valves, whistles.
 Gray Motor Co.—Lieb and Larned Sts. Marine motors.
 Gemmer Mfg. Co. Steering apparatus.
 Globe Brass Works.—13-15 Macomb St. Bow separators, top fixtures, metal trimmings.
 Greenslade Oil Co.—23d St. and M. C. Ry. Oils.
 Hayes Mfg. Co.—360-370 Maybury Ave. Wood and metallic bodies, battery boxes, tool boxes, dashes and fenders, drip pans, hoods, mufflers, radiators, steps, tanks.
 Hill, R. S.—78 E. Fort St. Gasoline marine motors.
 Holley Bros. Co.—661-675 Beaubien St. Carbureters, magnétos and ignition dynamos.
 Holmes Bros. Auto tops.
 Hugh Wallace Co.—Boulevard and Orleans St. Auto robes and miscellaneous wearing apparel.
 Hydraulic Oil Storage Co.—820 Penobscot Bldg. Oil burners, oil systems.
 Ideal Manufacturing Co. Pipe and brass fittings.
 Lavigne Mfg. Co. Lubricators, oil cups, oil pumps.
 McRae & Roberts Co.—227-235 Campbell Ave. Pipe and brass fittings, water-line gauges, oil guns.
 Massnick Mfg. Co.—1567 River St. Special automobile machinery, machine work to order.
 Meyer, Morris F.—65-67-69 E. Woodbridge St. Steering wheels, glass wind shields.
 Michigan Bolt and Nut Works.—Fort Meldrum Ave. Drop forgings.
 Michigan Crucible Steel Castings Co.—Guion St. Steel castings.

MICHIGAN—Detroit (Continued)

Michigan Lubricator Co.—661-671
Beaubien St. Lubricators, oil
pumps.

Michigan Storage Battery Co.—24
Atwater St., E. Storage batteries.

Michigan Top Co.—17 Duffield St.
Tops, wind shields, bow separators.

Milne Auto-Start Co.—919 W. Fort
St. Safety starting devices.

Moon Apex Brake Co., The.—Third
and Porter Sts. Brakes.

Morgan and Wright. Tire cement,
tire patches, tire tools, inner tire
tubes, pneumatic tires, solid tires.

Morgan & Wright. Solid tires.

National Cutlery Co. Machinery
springs.

Northway Motor & Mfg. Co.—Grand
Ave. Axles, clutches, brake and
clutch cork inserts, transmission
gears, auto motors.

Penberthy Injector Co. Drop forg-
ings, water-line gauges, grease cups,
lubricators, oil cups.

Peninsular Milled Screw Co.—751
Bellevue Ave. Bolts and nuts,
cups and cones, lock nuts and
washers, screw machine products,
screws.

Pennsylvania Rubber Co.—237 Jeffer-
son Ave. Tires.

Pioneer Woolen Mills.—1120 Beaufait
St. Auto robes, miscellaneous wear-
ing apparel.

Proctor-Raymond Mfg. Co. Bells.

Puritan Machine Co.—12-16 Gratis
Ave. Steering gears, transmissions,
circulating pumps.

Republic Rubber Co.—237 Jefferson
Ave. Tires.

Rex Motor Co. Gasoline marine
motors, spark plugs.

Ritter Mfg. Company.—242 Jefferson
Ave. Bodies, tops, glass wind
shields.

Robert Instrument Co., The.—56
Shelby St. Battery switches, pocket
battery meters, timers, spark coils,
spark plugs.

Roehm & Davison, Ltd.—91-95 Wood-
bridge St. Curtain fasteners, but-
tons, and tacks, leather, carpet,
bows, hair, webbing.

Saint Clair Motor Co.—131 Beaubien
St. Marine motors.

Scherer & Co., H. Bow sockets, top
fixtures, metal trimmings.

Schug Electric Co., The.—326 Jeffer-
son Ave. Storage batteries, elec-
tric controllers, spark coils, spark
plugs, electric switches.

Seidler-Mina Electric Co.—207 Jeffer-
son Ave. Spark plugs and battery
switches.

MICHIGAN—Detroit (Continued)

Sherwood Brass Works.—1167 Jeffer-
son Ave. Brass, bronze, aluminum
and copper castings.

Smith & Co., Jos. N.—Fourth and
Porter Sts. Auto mountings, locks,
hinges, handles, coat and foot rails,
heel board catches, lamp brackets,
mouldings, soaps, tire holders, prop
rests.

Standard Pattern Works. Patterns.

Swinehart Clincher Tire and Rubber
Co.—239 Jefferson Ave. Tires.

United Mfg. Co.—175 Woodbridge
St. Auto and marine motors.

Waterman Marine Motor Co. Ma-
rine motors.

Waterman Marine Motor Co. Ma-
rine and auto motors.

Webster Mfg. Co.—149 Jefferson Ave.
Gasoline tank gauges.

Western Malleable Steel Co.—1250
River St. Gray iron and steel cast-
ings, drop forgings.

Widmer Machine Works.—43-47 Fort
St., E. Metal gear wheels, rawhide
gear wheels, machine work to order.

Winkley Co., The.—226 Abbott St.
Carbureters, grease cups, lubrica-
tors, oil cups, oil guns, gasoline
strainers.

Wilson Body Co., C. R. Automobile
bodies.

Wolverine Leatherine Goods Co.—59
E. Fort St. Leather, leather wash-
ers.

Wolverine Radiator Co. Radiators.

Publications.

Motor News.—92 Griswold St.

Repairing, Automobile.

Bingham's Auto Garage. — Grand
River Ave. and 5th St.

Cadillac Motor Car Co.—265 Jeffer-
son Ave. (Cadillac.) Garage.

Leckner, H. B.—1162 St. Albans Ave.

Standard Auto Co.—Woodward Ave.,
Cor. Alexandrine. (Packard, Olds-
mobile.) Supplies.

Supplies, Automobile.

Miller, Chas. E.—227½-229 Jefferson
Ave. Manufacturers, jobbers, ex-
porters, importers.

Standard Auto Co.—Woodward Ave.,
Cor. Alexandrine. (Packard, Olds-
mobile.) Repairs.

DOWAGIAC—

Automobile Agents and Dealers.

Baker, F. H. (Haynes.)

Dowagiac Mfg. Co. (Maxwell, Mitch-
ell.)

Schmitt Bros. (Jackson.)

DUNDEE—

Garages:

Wolverine Auto & Com. Vehicle Co.

MICHIGAN (Continued)

ELSIE—

Automobile Agents and Dealers.
Hankins Bros. (National.)

ESCANABA—

Automobile Agents and Dealers.
Edwards, L. K.—Masonic Block.
(Cadillac.)
Escanaba Cycle Works, The.—1102
and 602 Ludington St. (Rambler.)

FLINT—

Automobile Agents and Dealers.
Pettis & Bolton.—427 S. Saginaw St.
(Ford.)
Smith, A. R.—809 E. Kearsley St.
(Buick.)
Automobile Manufacturers, Gasolene.
Buick Motor Co.
Janney Motor Co.
Garages.
Ellis, J. C.—210 Saginaw Ave.
Flint Garage Co., The.—402 N. Sag-
inaw St.
Graham & Smith.
Parts and Accessories Manufacturers.
Armstrong Mfg. Co., The J. B. Leaf
springs.
Imperial Wheel Co. Wood wheels.
Weston-Mott Co.—Axles, channels,
hubs, steel rims, wood wheels.

GRAND RAPIDS—

Clubs and Associations.
Grand Rapids Automobile Club.—Dr.
D. Emmet Welch, Sec.; Wonderly
Bldg.
Michigan State Automobile Ass'n.
Automobile Agents and Dealers.
Adams & Hart.—49 N. Division St.
(Franklin, Elmore, Peerless.)
Beelby Supply Co.—39 Fountain St.
(Model.)
Bronson, C. J.—42 Kent St. (Cadillac,
Winton.)
Buick-Waller Co.—Ottawa and Louis
Sts. (Buick, Pope-Toledo.)
Continental Auto Co.—93 Jefferson
Ave. (Dolson.)
Dean Bros.—160 N. Ionia St. (Jack-
son.)
Everett Automobile Co.—148 N. Ionia
St. (Gale.)
Lubeck Automobile Co.—148 N. Ionia
St. (Locomobile, Oldsmobile.)
Luce & Banks Co.—87 Division St.
(Maxwell.)
Morrison, Geo. H. (Waltham.)
Richmond-Jarvis Co.—13 Park St.
(Jewel, Rambler, National.)
Squires, E. G.—Ottawa and Pearl
Sts. (Gearless, Michigan.)
Vandecar, W. D.—157 N. Ottawa St.
(Reo, Glide.) Garage, repairing.
Automobile Manufacturers, Electric.
Holson Motor Patents Co., Ltd.

MICHIGAN (Continued)

**Automobile Manufacturers, Electric
Commercial.**

Couple-Gear Freight-Wheel Co.—
Pythian Temple.
Holson Motor Patents Co., Ltd.
Automobile Manufacturers, Electric
Austin Auto Co.
Menges Motor Car Co.

Garages.

Vandecar, W. D.—157 N. Ottawa St.
(Reo, Glide.) Repairing.

Motor Boat Manufacturers.

Wolvetime Motor Works.—130 S
Front St.

Motorcycle Agents and Dealers.

Adams & Hart.—47 N. Division St.
(Indian.)

Parts and Accessories Manufacturers.

Auto Rail & Equipment Co.—113
Michigan Trust Bldg. Robe and
foot rails.
Grand Rapids Gas Engine Yacht Co.
Marine motors, kerosene motors.
Inner Shoe Tire Co.—64 Monroe St.
Anti-skid devices, tire cases, tire
patches, tire shoes.
Lamb & Co.—Kent and Lyons Sts.
Electric controllers, electric motors.
Lamb Electric Co.—31 Canal St. Elec-
tric generators, special automobile
machinery, electric motors.
Peninsula Motor Co. Marine motors.
Rhodes Mfg. Co. Tire tools.
Sintz, Guy L.—Fulton and Front Sts.
Carbureters, transmission gears,
auto motors, timers.
Sintz-Wallin Co., The.—285 S. Front
St. Gray iron castings, marine
motors.
Wilmarth & Norman Co.—585 Canal
St. Drill grinders, surface grinders.
friction countershafts.
Wolverine Motor Works. Marine
motors, kerosene motors.
Repairing, Automobile.
Willoughby, S. W.—27 W. Bridge St.
Vandecar, W. D.—157 N. Ottawa St.
(Reo, Glide.) Garage.

GREENVILLE—

Automobile Agents and Dealers.
Kemp, E. A. (Jackson.)

HANCOCK—

Garages.
Courtenay, Dr. W. A.

HOLLAND—

Motor Boat Manufacturers.
Holland Launch & Engine Co.

HUDSON—

Automobile Agents and Dealers.
Abbott, W. H. (Jackson.)
Avis & Son, G. F. (Buick.)
Motorcycle Manufacturers
Hudson Mfg. Co.

MICHIGAN (Continued)

IONIA—

Automobile Agents and Dealers.
Chamberlain, C.—434 Front St. (Maxwell, Ford.)

ISHPEMING—

Automobile Agents and Dealers.
Nelson, E. R. (Franklin.)
Wahlman, S. J. (Pope.)

JACKSON—

Automobile Agents and Dealers.
Lockwood Bros.—103-109 W. Pearl St. (Pope-Toledo.) Supplies, garage.

Automobile Manufacturers, Gasolene.
C. V. I. Motor Co.

Jackson Automobile Co.
Steel Swallow Co., The.

Automobile Manufacturers, Gasolene Commercial.

Whiting Motor Car Co.

Garages.

Lockwood Bros.—103-109 W. Pearl St. (Pope-Toledo.) Supplies.

Parts and Accessories Manufacturers.

American Oil Co.—170-178 S. Water St. Oils, greases, varnish soap.

American Top Co. Auto tops.

Auto Oil Co. Oils, semi-solid oils, auto body polishes, auto body soaps, hand soaps.

Clark Motor Co., E. C. Transmission gears and auto motors.

Jackson Body Co. Wood and metallic bodies.

Lewis Spring & Axle Co. Springs.

Lockward-Ash Motor Co. Gasoline marine motors.

McKeel & Co., Geo. A. Roller bearings, thrust bearings, screw machine works, pressed metal parts.

National Wheel Co. Wheels.

Novelty Mfg. Co. Automobile heaters.

Ventilated Cushion & Spring Co. Trimmings, cushion springs, and cushions.

Supplies, Automobile.

Lockwood Bros.—103-109 W. Pearl St. (Pope-Toledo.) Garage.

KALAMAZOO—

Automobile Agents and Dealers.
Boyles, Geo.—425 E. Main St. (Ford.)
Harlow, Wm. O. (Maxwell.)

Locher & Robb.—315 S. Burdick St. (Franklin.)

Automobile Manufacturers, Gasolene.
Michigan Automobile Co., Ltd.

Garages.

Automobile Garage & Repair Co.
Campbell, A. V.

Russell & Hoague.—425 E. Main St. Repairs, supplies.

Parts and Accessories Manufacturers.
Abbey & Co., P. L. Emergency accident cabinets.

MICHIGAN (Continued)

Advance Mfg. Co.—Todd Bldg. Babbitt metals, brass and copper metals.

Blood Bros Machine Co. Gasoline tank gauges, steering apparatus, universal joints.

Burt Mfg. Co.—128 N. Edward St. Gasoline automobile motors, timers.

Cook's Standard Tool Co. Jacks.

D'Arcy Spring Co. Seat springs.

Kalamazoo Carburetter Co.—1301 Grand Ave. Carbureters.

Kalamazoo Spring & Axle Co. Auto springs, carriage wagon seat springs.

Michigan Automobile Co., Ltd. Auto motors, gear blanks, machine work to order.

New Erie Mfg. Co. Babbitts and bronze metals.

Reed Mfg. Co. Steel castings.

Standard Tool Co.—432 Harrison St. Jacks, tools.

Repairing, Automobile.

Russell & Hoague.—425 E. Main St. Supplies, garage.

Supplies.

Russell & Hoague.—425 E. Main St. Garage, repairs.

LACOTA—

Automobile Agents and Dealers.
Deal, R. B. (Waltham.)

LANSING—

Automobile Agents and Dealers.

Clawson, Smith.—420-422 Michigan Ave. (Ford.)

Holmes Co., M. A.—422 Michigan Ave, E. (Jackson.)

Lane, O. W.—117 Grand St. (Ford.)

Owen & Co., R. M. (Reo.)

Parts and Accessories Manufacturers.

Atlas Drop Forge Co. Forgings and cranks.

Auto Body Co., The.—Franklin Ave. Wood and metallic bodies, spark coil boxes, dashes and fenders.

Murrey & Murrey.—113 Allegan St., E. Tanks.

LAPEER—

Automobile Agents and Dealers.
Lapeer City Garage. (Ford.)

LUDINGTON—

Parts and Accessories Manufacturers.

Cartier Chapman & Co. Brass wind shields.

MANCELONA—

Parts and Accessories Manufacturers.
Eclipse Engine Works. Marine motors.

MARQUETTE—

Automobile Agents and Dealers.

Fenner, F. N. (Cadillac.)

Motorboat Manufacturers.

Lake Shore Engine Works.

MICHIGAN (Continued)

MARSHALL—

Parts and Accessories Manufacturers.
New Process Steel Co., The. Steel castings, chrome-nickel steel.

MENDON—

Garages.
Flewelin, M. C.

MENOMINEE—

Automobile Agents and Dealers.
Menominee River Auto Co.—418 Main St. (Reo, Premier, Queen, Ford.)
Michigan Automobile and Supply Co. (Holsman.)

Poyer, D. F.—Main St. (Buick, Cadillac.)

Parts and Accessories Manufacturers.
Dudley Mfg. Co., A. Wrenches.

MONROE—

Automobile Agents and Dealers.
Hubble, N. B. (Wayne, Pope-Waverley.)

MT. CLEMENS—

Garages.
Mt. Clemens Garage Co.—16 New St.

MT. PLEASANT—

Automobile Agents and Dealers.
Hornung & Son. (Cartercar.)

MUSKEGON—

Automobile Agents and Dealers.
Muskegon Bicycle & Auto Co.—18-20 Clay Ave. (Rambler, Maxwell.)

Motorboat Manufacturers.

Racine Boat Mfg. Co.
Parts and Accessories Manufacturers.
Continental Motor Mfg. Co. Marine and automobile motors, transmissions and clutches.

Racine Boat Mfg. Co. Marine motors.

NILES—

Automobile Agents and Dealers.
Cook, Fred. W. (Northern.)

OXFORD—

Garages.
Detroit-Oxford Mfg. Co.

OWOSSO—

Parts and Accessories Manufacturers.
American Tire Co. Anti-skid devices, tire treads, leather tires.

PALMER—

Automobile Agents and Dealers.
Honkawara, Paul. (Waltham.)

PINCKNEY—

Automobile Agents and Dealers.
Reason & Son, Geo. W. (Maxwell, Reo, Cartercar.)

PONTIAC—

Automobile Agents and Dealers.
Illinois Garage & Mfg. Co. (Reo.)
Automobile Manufacturers, Gasolene.
Oakland Motor Car Co.
Pontiac Spring Wagon Works. 12 H. P. gas car.
Welch Motor Car Co.

MICHIGAN (Continued)

Automobile Manufacturers, Gasolene Commercial.

Pontiac Motor Car Co.

Rapid Motor Vehicle Co.

Parts and Accessories Manufacturers.

Hess-Pontiac Spring & Axle Co. Automobile springs.

Hubbard Spring Co., M. D. Machinery springs, and seat springs.

Pontiac Body Co. Wood and metallic bodies.

Pontiac Knitting Co. Caps, gloves.

Reason Automatic Air Pump Co.

Fuel, air pumps.

PORT HURON—

Automobile Agents and Dealers.

Huron Auto & E. Electrical Co.—325 E. Water St. (Northern, Cadillac.)

Wilson, W. Grant.—2343 Military St. (Maxwell.)

Automobile Manufacturers, Gasolene Commercial.

Troutt-Yokom Car Co.

Parts and Accessories Manufacturers.
Emergency Wheel & Novelty Co.

Gasoline tank gauges.

Lee Injector Co. Lubricators.

Lee Mfg. Co.—Conners St. Transmissions, steering gears, brass castings, machine works, globe and check valves.

Port Huron Engine & Thresher Co. Malleable iron castings.

Watt Engine Co. Automobile motors.

RIVES JUNCTION—

Repairing, Automobile.

Buell, J. C.

SAGINAW—

Automobile Agents and Dealers.

Beck, J. P.—196 James Ave. (Maxwell, Rambler, Ford.)

Bohnet, Geo. J.—114 S. Franklin St. (Reo.)

Doan, E. D.—926 Janes Ave. (Reo, Cartercar.)

Fischer, J. G. (Monarch.)

Norris Automobile Co.—Genesee Ave. (Buick, Peerless, Cadillac, Oldsmobile, Woods.)

Automobile Manufacturers, Gasolene.

Rainier Motor Car Co., The.

Parts and Accessories Manufacturers.

Ayres Gasoline Engine Works. Marine motors.

Brooks Boat Mfg. Co. Marine motors.

Bruno-Knapp Co. Marine motors.

Erd Motor Co. Gasoline marine motors.

Mershon & Morley. Portable houses.

Norris Automobile Co.—Genesee Ave. Tire protectors.

Saginaw Yacht & Motor Co. Marine gasoline motors.

Stork Motor Co. Marine motors.

United States Graphite Co. Graphite greases.

MICHIGAN (Continued)

SOUTH HAVEN—

Automobile Agents and Dealers.

South Haven Auto Co. (Franklin, Thomas, Babcock, Elmore.)

ST. JOSEPH—

Garages.

Woodin, C. D.

Motorboat Manufacturers.

Truscott Boat Mfg. Co.

Parts and Accessories Manufacturers.

Spaulding Engine Co. Marine motors, reversible propeller wheels.

Truscott Boat Mfg. Co. Automobile and marine motors.

STURGIS—

Automobile Agents and Dealers.

Western Motor Car Co. (Knox.)

Parts and Accessories Manufacturers.

Freeland Sons Co., B. F. Marine motors, tanks, storage tanks.

TECUMSEH—

Automobile Agents and Dealers.

Voegeley, Chas. (Cadillac.)

THREE RIVERS—

Automobile Manufacturers, Gasolene Commercial.

Sheffield Car Co.

TRAVERSE CITY—

Automobile Agents and Dealers.

Paige, Walter M.—131 Cass St. (Maxwell.)

Garages.

Stewart, D. W.

Parts and Accessories Manufacturers.

Jackson Machine Works. Marine motors.

WYANDOTTE—

Motorboat Manufacturers.

Detroit River Boat & Oar Co., The.

Parts and Accessories Manufacturers.

Bishops & Co., J. H. Auto robes, miscellaneous wearing apparel.

MINNESOTA

AUSTIN—

Automobile Agents and Dealers.

King, B. F. (Columbia.)

BLUE EARTH—

Automobile Agents and Dealers.

Barnes Bros. (Buick.)

CROOKSTON—

Automobile Manufacturers, Gasolene.

Maplebay Mfg. Co.

Parts and Accessories Manufacturers.

Maplebay Mfg. Co. Tire treads.

DULUTH—

Clubs and Associations.

Duluth Automobile Club.—W. W. Walker, Sec.

Automobile Agents and Dealers.

Buchanan, Wm. (Buick.)

Crouch, F. M.—St. Louis Hotel. (Woods.)

Duluth Auto Co. (White, Maxwell.)

MINNESOTA (Continued)

Filiatrault, E. J. (Thomas-Flyer.)

Mutual Electric Co. (Pope-Toledo.)

Richardson Electric Co.—210 W. 1st St. (Pope-Waverley, Buick, Cadillac, Maxwell, Reo, White.)

Upham Co., N. J. (Waltham.)

Motorboat Manufacturers.

Pierson Boat Construction Co.

Parts and Accessories Manufacturers.

Duluth Gas Engine Works.—Minnesota Ave. and Vine St. Marine motors, propellers.

ELK RIVER—

Automobile Agents and Dealers.

Babcock, W. L. (Buick.)

FOSSTON—

Automobile Agents and Dealers.

Ray, D. A. (Buick.)

HIBBING—

Automobile Agents and Dealers.

Smith, Fred. M.—218 2d Ave. (Rambler.)

LAKEFIELD—

Automobile Agents and Dealers.

Gage Bros. (Monarch.)

LUVERNE—

Automobile Manufacturers, Gasolene.

Luverne Automobile Co.

Garages.

Luverne Automobile Co.

Parts and Accessories Manufacturers.

Luverne Automobile Co. Wood wheels.

MANKATO—

Clubs and Associations.

Mankato Automobile Club.—Chas. M. Masters, Sec.

Automobile Agents and Dealers.

Jones & Hopkins. (Rambler.)

Lewis & Sons, J. A. (Cadillac.)

Schwender Bros. (Pierce, Racine.)

Garages.

Saulpaugh, C. H.

MARSHALL—

Automobile Agents and Dealers.

Hard, Dr. A. D. Mechanical engineer. (Waltham.) Repairing.

Repairing, Automobile.

Hard, Dr. A. D. Mechanical engineer. (Waltham.)

MAYNARD—

Automobile Agents and Dealers.

Hawkinson, O. (Waltham.) Repairing, garage.

Garages.

Hawkinson, O. (Waltham.) Repairing.

Repairing, Automobile.

Hawkinson, O. (Waltham.) Garage.

MINNEAPOLIS—

Clubs and Associations.

Automobile Club of Minneapolis.—

Sewall D. Andrews, Sec.; 309 New York Life Bldg.

Minneapolis Automobile Club.—R. J. Smitz, Sec.; 1219 Guaranty Bldg.

MINNESOTA (Continued)

Minnesota State Automobile Association.
Automobile Agents and Dealers.
 American Automobile Co. (Stoddard-Dayton.)
 Auto Selling & Repair Co.—304 N. Western Bldg. (Dragon.)
 Barclay Auto Co.—246 Third Ave., S. (Thomas Flyer, Stanley, Autocar.)
 Bennet, A. C.—24 N. 8th St. (Winton.)
 Benz, W. G.—246-250 3d Ave. (Rapid, Gale, Moline, Jackson.)
 Bergstrom, Oscar M.—310 S. 9th St. (Aerocar.)
 Bowman & Barrett Auto Co. (Monarch.)
 Burney-Bird Automobile Co. (Mitchell, Maxwell.)
 Caplin, G. W.—425 5th St. (Royal.)
 Cartercar Co.—249 3d Ave. (Cartercar.)
 Chase & Co., A. F.—418 3d Ave., S. (Brush, Maxwell.)
 Columbus Buggy Co. (Columbus.)
 East Side Auto Co. (Queen.)
 Evans Motor Car Co.—522 S. 10th St. (Jewel, Wayne, Mitchell.)
 Fawkes Auto Co.—113 S. 6th St. (Holsman, National, Rambler.)
 Fox, W. A.—429 3d Ave. (Cartercar.)
 Hans Motor Car Co.—424 S. 4th St. (Colt Runabout, Stearns.)
 Haynes Automobile Co.—220 S. 6th St. (White.)
 Jordan Automobile Co.—217 4th St., S. (Locomobile, Peerless, Franklin, Corbin.) Garage, repairing.
 Kemp, D. W.—129 W. 15th St. (Earl.)
 Maxfield & Rice Bros.—1401 Hennepin Ave. (Haynes.)
 Minneapolis Automobile Co.—830 Hennepin Ave. (Auburn, Austin.)
 Model Motor Works. (Auburn, Austin.)
 Northwestern Cadillac Co.—316-322 4th Ave., S. (Cadillac, Pope-Waverley.)
 Pence Automobile Co.—717 Hennepin Ave. (Buick, Packard, Waltham, Pierce-Arrow, Stevens-Duryea, Pope-Toledo.)
 Tenvoorde, J. H. (Deere.)
 Thornhill, W. C. (Frayer-Miller, Reo.)
 Winston, Jr., F. G.—709 Hennepin Ave. (Columbia, Oldsmobile, Waltham, Woods.)
Automobile Manufacturers, Gasolene.
 Wilcox Motor Car Co., H. E.—11th Ave. and Marshall St., N. E.
Automobile Manufacturers, Gasolene Commercial.
 Four Traction Auto Co.

MINNESOTA (Continued)

Garages.
 Adland Storage & Auto Co.—240 7th Ave., S.
 Jordan Automobile Co.—217 4th St., S. (Locomobile, Peerless, Franklin, Corbin.) Repairing.
 Joy Bros.—187 E. 6th St.
 Northwestern Motor Vehicle Co.—112 S. 6th St.
 Velie, C. D.
Motorcycle Agents and Dealers.
 Bisset, F. H.—529 S. 2d Ave. (Indian.)
Parts and Accessories Manufacturers.
 Diamond Rubber Co.—117 S. 6th St.
 Fisk Rubber Co.—704 Hennepine Ave. Tires.
 Fouch Disc Wheel Co.—Offices, Room 11, Tribune Bldg. Pressed steel wheels.
 Hans Co., Edmund E. Gasoline indicators.
 Knapp Mfg. Co.—2529 Polk St., N. E. Body irons.
 Morgan & Wright.—708 Hennepin Ave. Tires.
 Oliver Instrument Co.—Hennepin and Seventh Sts. Speedometers.
 Rea Bros. & Co.—202 Nicollet St. Tire cement.
 Schurmeier Wagon Co.—29 Western Ave. Wood and metallic bodies.
 Theim Mfg. Co. Gasoline auto motors.
 Watermann-Hunter Co.—515 1st Ave. Portable houses.
Repairing, Automobile.
 Jordan Automobile Co.—217 4th St., S. (Locomobile, Peerless, Franklin, Corbin.) Garage.
OWATONNA—
Clubs and Associations.
 Automobile Club of Owatonna.—Dr. A. B. Stewart, Sec.
Parts and Accessories Manufacturers.
 Virtue & Pound Mfg. Co. Transmission gears, marine motors.
PLAINVIEW—
Garages.
 Grieger, L.
RED WING—
Clubs and Associations.
 Automobile Club of Red Wing.—Walter B. Sheldon, Sec.
Automobile Agents and Dealers.
 Coleman, John G. (Waltham.)
Motorboat Manufacturers.
 Red Wing Boat Mfg. Co.
Parts and Accessories Manufacturers.
 Red Wing Boat Mfg. Co. Marine motors.
ROCHESTER—
Garages.
 Ellis & Edwards.

MINNESOTA (Continued)

SPARTA—

Automobile Agents and Dealers.
Day, W. A., Dr. (Waltham.)

SPRING VALLEY—

Automobile Agents and Dealers.
Enterprise Machine Works.—Cor.
Park St. and Valley Ave. (Reo.)
Parts and Accessories Manufacturers.
Kilburn, Edwin. Body irons, feed
water heaters, boiler pumps, steam
engines.

ST. CLOUD—

Clubs and Associations.
Automobile Club of St. Cloud.—J. C.
Cotton, Sec.
Automobile Agents and Dealers.
Branch, H. P. (Buick.)

STILLWATER—

Motorboat Manufacturers.
Minnesota Boat & Power Works.

ST. PAUL—

Clubs and Associations.
Automobile Club of St. Paul.—H. S.
Johnson, Sec.; 911 Pioneer Press
Bldg.
Automobile Agents and Dealers.
Bazille Auto Co.—15 E. 9th St. (Au-
tocar, Stevens-Duryea, Buick,
Baker.)
Burney Bird Auto Co.—319 Wabash
St. (Haynes, Mitchell.)
Fawkes Auto Co.—202-6 W. 6th St.
(Holsman, National, Rambler,
Glide.)
Garland, R. F. (Maxwell.)
Hipkins, F. E. (Waltham.)
Joy Auto Co., C. J.—368 Minnesota
St. (Packard, Pope-Hartford, Pope-
Waverley.)
Ramaley, F. W.—650 Grand Ave.
(Rauch & Lang, Stoddard-Dayton.)
Robinson, T. F. (Reliance.)
St. Paul Motor Co. (Oldsmobile.)
Western Automobile Co.—384 Cedar
St. (Franklin, Winton, Woods,
Pope-Toledo.)
Garages.
Haynes Automobile Co., The.—317
Robert St.
Siems, Peter.—Summit Ave. and Grot-
to St.
Motorboat Manufacturers.
St. Paul Boat Co.
Motorcycle Manufacturers.
Wagner Motor Cycle Co.—327 St.
Peter St.
Parts and Accessories Manufacturers.
Ferodowill Mfg. Co. Air compres-
sors, jacks, pump tire inflators.
Minnesota Malleable Iron Co. Mal-
leable iron castings.

TRACY—

Automobile Agents and Dealers.
Westman's Automobile Agency. (Au-
gust.)

MINNESOTA (Continued)

WAYZATA—

Parts and Accessories Manufacturers.
Campbell Motor Co. Marine motors.

WHEATON—

Automobile Agents and Dealers.
Amidon, L. H. (Waltham.)

WINONA—

Clubs and Associations.
Automobile Club of Winona.—Theo-
dore Wold, Sec.
Automobile Agents and Dealers.
Adams Automobile Co. (Cadillac.)
Garages.
Steffes Launch & Automobile Co.

WORTHINGTON—

Automobile Agents and Dealers.
Wolven, E. J. (Rambler.)

MISSISSIPPI

BILOXI—

Garages.
Elder & Co., G. B.

CLARKSDALE—

Automobile Agents and Dealers.
Davis, Henry. (Oldsmobile.)
Holland & Campbell. (Buick.)
Lawler, R. B. (Winton.)
Motor Traction Co.—323 Delta Ave.
(Lambert.)
Garages.
Holland, W. P.
Repairing, Automobile.
Clarksdale Machinery & Supply Mfg.
Co.

GREENVILLE—

Garages.
Ehlbert, Chas. A.

HATTIESBURG—

Automobile Agents and Dealers.
Robinson, D. N. (Waltham.)

JACKSON—

Automobile Agents and Dealers.
Lauden, J. C. (Cadillac.)

MERIDIAN—

Garages.
Meridian Auto & Cycle Co.

NATCHEZ—

Garages.
Kelly, J. H.

VICKSBURG—

Automobile Agents and Dealers.
Fisher, F. J. (Reo.)
Robinson, B. J. (Cadillac.)
Garages.
Ryan, J. L.

MISSOURI

AURORA—

Automobile Agents and Dealers.
Featherstone, J. E. (Holsman.)

BROOKFIELD—

Automobile Agents and Dealers.
Chapman, Treat P. (Waltham.)

MISSOURI (Continued)

CARTHAGE—

Automobile Agents and Dealers.

Carthage Auto Garage. (Maxwell.)

Repairing, garage.

Griep, H. C. (Maxwell.)

Garages.

Carthage Auto Garage. (Maxwell.)

Repairing.

Repairing, Automobile.

Carthage Auto Garage. (Maxwell.)

Garage.

FORISTELL—

Automobile Agents and Dealers.

Goltermann & Sons, Chas. (Waltham.)

HORNET—

Automobile Agents and Dealers.

Vicory, Chas. A.—R. F. D. No. 2.

(Holsman.)

JOPLIN—

Automobile Agents and Dealers.

Adams, S. L. (Cadillac.)

Joplin Auto Co.—618-620 Wall St.

(Holsman.)

Garages.

Morgan, W. E.

Webb Auto Co., A. C.—2d and Jop-

lin Sts.

KANSAS CITY—

Clubs and Associations.

Automobile Club of Kansas City.—

W. P. M. Stevens, Sec.; 502 American Bank Bldg.

Automobile Agents and Dealers.

Abercrombie, C. R. (Monarch.)

Bales, Frank. (Cadillac.)

Bonney Motor Car Co. (Jewel, Wayne.)

Buick Automobile Co.—15th St. and Virginia Ave. (Buick.)

Demster Machinery Co., W. R.—16th and Walnut Sts. (Maxwell.) Supplies, garage, repairs.

Depot Carriage & Baggage Co. (Rambler.)

Ettwein Motor Car Co., The—37th and Main Sts. (Stoddard-Dayton, Aero-car, Welch.)

Ferguson Implement Co.—2105 E. 15th St. (Haynes, Gale.)

Ford Motor Co.—318 E. 11th St. (Ford.)

Greenlease, Robt. C.—1316 E. 15th St. (Thomas Flyer.)

Kaw Valley Auto Co.—3130 Main St. (Premier, Mitchell.)

Lemoigue & O'Beirne.—1735 Grand Ave. (Panhard.)

March, A. A.—904 Benton Blvd. (Holsman.)

Mason Car Sales Co.—3130 Main St. (Mason.)

Midland Motor Car Co.—1116 E. 15th St. (Peerless.)

MISSOURI (Continued)

Missouri Valley Auto Co.—1112-1114 E. 15th St. (White.) Repairing, garage.

Moriarty & Co., E. P. (Packard, Stevens-Duryea.) Garage.

Palace Auto Co.—1408-1410 Walnut St. (Pierce Arrow, Oldsmobile, Columbia.) Garage, repairing.

Pope-Toledo Motor Car Co. (Pope line.)

Richter Bros.—2406 Grand St. (Moon.) Repairing.

Smith Automobile Co. (Smith.)

Studebaker Bros. Mfg. Co.—13th and Hickory Sts. (Studebaker.)

Wickstrom & Shafer. (Holsman.)

Automobile Manufacturers, Gasolene.

Bell, W. L.

Garages.

Central Auto Co., The.—18th St. and Grand Ave.

Day Auto Co.

Demster Machinery Co., W. R.—16th and Walnut Sts. (Maxwell.) Repairs, supplies.

Marshall, Ed.—1221 Baltimore Ave.

Missouri Valley Auto Co.—1112-1114 E. 15th St. (White.) Repairing.

Moriarty & Co., E. P. (Packard, Stevens-Duryea, Peerless, Knox.)

O'Bierne & Co., F.—1737 Grand St.

Palace Auto Co.—1408-1410 Walnut St. (Pierce Arrow, Oldsmobile, Columbia.) Repairing.

Royal Tourist Car Co.—1108 E. 15th St.

Motorcycle Agents and Dealers.

Hanson, Chas.—1406 Grand Ave. (Indian.)

Reich, Robt. A.—Broadway. (Merkel.)

Parts and Accessories Manufacturers.

Demster Machinery Co., W. R., The. Carbureters.

Fisk Rubber Co.—1330 Main St. Tires.

Minogue Body & Seat Co. Wood and metallic bodies.

Pitless Turntable Co. Turntables.

Repairing, Automobile.

Demster Machinery Co., W. R., The.—16th and Walnut Sts. (Maxwell.) Garage, supplies.

Missouri Valley Auto Co.—1112-1114 E. 15th St. (White.) Garage.

Palace Auto Co.—1408-1410 Walnut St. (Pierce Arrow, Oldsmobile, Columbia.) Garage.

Richter Bros.—2406 Grand St. (Moon.)

Supplies, Automobile.

Demster Machinery Co., W. R., The.—16th and Walnut Sts. (Maxwell.) Garage, repairing.

MISSOURI (Continued)

KING CITY—

Garages.

Greene, G. M.

LEXINGTON—

Automobile Agents and Dealers.

Hays, Carl W. (Missouri.)

MACON—

Clubs and Associations.

Automobile Club of Macon.—Chas. H. Payson, Sec.

MARYVILLE—

Automobile Agents and Dealers.

Fisher, J. L. (Waltham.)

Townsend, G. M. (Earl.)

MOBERLY—

Automobile Agents and Dealers.

Benth, John P.—111 N. William St. (Cadillac.)

MONETT—

Automobile Agents and Dealers.

White, Chas. (Jewel.)

PIERCE CITY—

Automobile Agents and Dealers.

Potter, Sidney E.—Bet. Elm and Walnut Sts. (Ford.) Garage, repairing.

Garages.

Potter, Sidney E.—Bet. Elm and Walnut Sts. (Ford.) Repairing.

Repairing, Automobile.

Potter, Sidney E.—Bet. Elm and Walnut Sts. (Ford.) Garage.

ST. JOSEPH—

Clubs and Associations.

Automobile Club of St. Joseph.—H. D. Todd, Sec.

Automobile Agents and Dealers.

Berry Foundry Co. (Reo.)

Mitchell Auto Co., F. F. (Glide.)

Priebe Carriage Co., C.—205 S. 4th St. (National.)

St. Joseph Automobile & Supply Co.—7th and Francis Sts. (Oldsmobile.)

Wyeth Auto & Supply Co.—216-218 N. 2d St. (Locomobile, Buick, Cadillac, Haynes, Stevens-Duryea.)

ST. LOUIS—

Clubs and Associations.

Automobile Club of St. Louis.—S. D. Capen, Sec.; 901 Security Bldg.
Missouri State Automobile Association.

Red Devil Racing Association.

Sedalia Automobile Club.—M. T. Slane, Sec.; 303 Ohio St.

Automobile Agents and Dealers.

Acme Automobile Co.—3944-46 Olive St. (Reo.)

Ambrose, Dr. O. A.—6125 Bartmer Ave. (Moline.)

American Garage Co.—5123 Delmar Ave. (Dragon.)

Automobile Renting Co. (Atlas.)

MISSOURI—St. Louis (Continued)

Bagnell Auto Co.—4156 Olive St. (Cadillac.)

Barnicle, Robt.—528 N. Vandeventer Ave. (Waltham.)

Capen Motor Car Co.—4739 McPherson Ave. (Locomobile.)

Colonial Auto Co.—3944 Olive St. (Reo, White.)

Commercial Motor Car Co.—4390 Olive St. (Reliance.)

Doxsee, A. S.—1414 Chestnut St. (Aerocar.)

Forest Automobile Co. (Oldsmobile.)

Geitz, Fred.—205 N. Main St. (Holsman.)

Greenwell-Seagraves Co.—5023 Delmar Ave. (Haynes.)

Halsey Auto Co.—3914 Olive St. (Buick, Packard, Stevens-Duryea, Franklin, Knox.)

Lakdel Automobile Co.—5143 Delmar Blvd. (Wayne, DeLuxe.) Garage.

Lesser, Julius. (Rainier.)

Lewis, T. S.—509 Chestnut St. (Logan.)

MacNish Auto Co.—3667 Olive St. (Queen, Ford, Rambler, National.)

Mason & Somers, W. R.—822 Victoria Bldg. (Columbus.)

Maxwell-Briscoe-Chase Co. — 3968 Olive St. (Maxwell.)

Mironda Motor Car Co.—1012 N. Grand Ave. (Lozier, Knox.)

Mississippi Valley Auto Co.—5023 Delmar Blvd. (Couple-gear, Elmore, Pope-Toledo, Peerless, Pope-Waverley, Mercedes, Woods.) Charging, repairing.

Moon Motor Car Co.—4400 N. Main St. (Moon.)

Morrison Auto Agency—3916 Washington St. (Welch.)

Park Automobile Co.—4432 Olive St. (Thomas Flyer, Baker, Autocar.)

Peper Automobile Co.—3922 Olive St. (American.)

Reyburn Motor Car Co.—4601 Olive St. (Royal Tourist, Stearns.)

St. Louis Automobile Co.—453 N. Boyle Ave. (Jackson.)

Scott, A. D.—3916 Wash. Ave. (Mitchell.)

Singer Automobile Co.—3939 Olive St. (Premier.)

Smith, E. L.—2339 S. Grand Ave. (Matheson.)

South Side Auto Co.—2339 S. Grand Ave. (Corbin, Matheson.)

Steward, A. C. (Dorris.)

Union Garage Auto Co., The (Rauch & Lang.)

Union Light & Power Co.—3920 Morgan St. (Rauch & Lang, Studebaker, Columbia.)

MISSOURI—St. Louis (Continued)

Van Automobile Co.—4706 Washington Ave. (Cleveland, Stoddard-Dayton.)

Washington Garage.—3918 Washington Blvd. (Pierce Arrow, Peerless, Winton.)

Western Auto Co.—4701 Washington Blvd. (Peerless, Winton, Pierce Arrow.)

Automobile Manufacturers, Gasolene.

A. B. C. Motor Vehicle Mfg. Co.—1512 Locust St.

American Buggy Auto Co.—4309 Olive St.

Auto Buggy Mfg. Co.—4395 Olive St.
Crescent Auto & Supply Co.—2254 Missouri Ave.

Dorris Motor Car Co.

Forest Automobile Co.

Haydock Automobile Mfg. Co., D. W. Moon Motor Car Co.

St. Louis Car Co.

Success Auto-Buggy Mfg. Co.—528 De Balliviere Ave.

Victor Automobile Mfg. Co.—171 Carroll St.

Automobile Manufacturers, Gasolene Commercial.

Whitman Agricultural Co.

Electric Battery Charging.

Mississippi Valley Auto Co.—5023 Delmar Blvd. (Couple-Gear, Elmore, Pope-Toledo, Pope-Waverley, Mercedes, Peerless, Woods.) Repairs.

Garages.

Cowle & Pierson.—1413 Grand Ave.

Delmar Motor Car Co.

Lakdel Automobile Co.—5143 Delmar Blvd. (Wayne, DeLuxe.)

Olive Auto Co.—3970 Olive St.

Motorboat Manufacturers.

American Boat & Machine Co.—3517 S. 2d St.

American Yacht & Motor Co.—Cherokee and De Kalb Sts.

Medart, Fred.

Motorcycle Agents and Dealers.

Hurck Motor & Cycle Co.—109 N. 12th St. (Indian.)

Motorcycle Manufacturers.

Gerr Co., Harry R.

***Parts and Accessories Manufacturers.**

Ajax-Grieb Rubber Co.—3948 Olive St. Tires.

American Foundry & Mfg. Co.—Herbert and Wright Sts. Gray iron castings, bronze trimmings.

Bell Mfg. Co., The.—113 Morgan St. Metal polishes.

Borbein Auto Co.—2109-11 N. 9th St. Running gears, bodies, wheels, axles, steering devices, complete chassis.

MISSOURI—St. Louis (Continued)

Cleaner Mfg. Co.—28-44 Olive St. Metal polish.

Consolidated Rubber Tire Co.—2334 Olive St. Tires.

Continental Tire Agency.—3908 Olive St. Tires.

Diamond Rubber Co.—3963-65 Olive St. Tires.

Electric Storage Battery Co.—Wainwright Bldg. Sales office.

Firestone Tire & Rubber Co.—2226 Olive St. Tires.

Goodrich Co., B. F.—3926-28 9th St. Tires.

Goodyear Tire & Rubber Co.—712-714 Morgan St. Tires.

Kalisch Air Brake Co.—1317 Chestnut St. Brakes, air compressors.

Leader Mfg. Co.—1808 Chestnut St. Auto body polishes, metal polishes.

Morgan & Wright.—538 N. Vandeventer Ave. Tires.

Mound City Oil & Supply Co.—204 N. Commercial St. Lubricating oils and greases.

National Equipment Co.—Holland Bldg. Gasoline and kerosene burners.

National Oil Burner & Equipment Co.—Holland Bldg. Condensers.

Newmastic Tire Co.—4148 Olive St. Tire fluid.

Newstadt Auto & Supply Co.—3948-3950 Olive St. Axles, wheels, bodies, hoods, radiators, handles.

Northrop Lubricating Oil Co.—308 N. Commercial St. Grease and oils.

O. K. Electric Co.—106-110 Locust St. Magnetos.

Republic Rubber Co.—1215 N. Broadway. Tires.

St. Louis Buggy Top Co.—2117-19 N. 9th St. Auto tops, cloth and carpet trimmings.

Shelter Top Co.—1240 N. 1st St. Auto tops.

Stempel Fire Apparatus Mfg. Co.—4520 N. 20th St. Fire extinguishers.

Supplementary Spiral Spring Co.—4528-4530 Delmar Ave. Shock absorbers.

Vehicle Tops & Supply Co.—900 Cass St. Storm aprons and curtains, lamp covers, tire cases, auto tops.

Wagner Electrical Mfg. Co.—Ammeters, voltmeters, charging apparatus, electric generators, electric motors.

Flower & Co., Walter L. Flexible tubing.

Waltke & Co., Wm.—Grand and 2d Sts. Hand soaps.

MISSOURI—St. Louis (Continued)

Wesco Supply Co.—7th St. and Clark Ave. Primary batteries.

Western Oil Pump Co.—2447 Kosciusko St. Oil pumps, tanks, storage tanks.

Young Carriage Co., Wm.—4524 Delmar Ave. Wood and metallic bodies.

Publications.—

Auto Review, The.

Repairing, Automobile.

Gardner Motor Co.—4388 Olive St. Mississippi Valley Auto Co.—5023

Delmar Blvd. (Couple-Gear, Elmore, Pope-Toledo, Pope-Waverley, Mercedes, Peerless, Woods.) Electric battery charging.

Supplies, Automobile.

Automobile Gasoline Co.—422 S. Theresa Ave.

Behan-Faught Motor Car Equipment Co.—3961 Olive St.

Neustadt Automobile and Supply Co.—3948-3950 Olive St.

SENECA—

Automobile Agents and Dealers. Provines, Harris G. (Waltham.)

SHEFFIELD—

Automobile Manufacturers, Gasolene Commercial.

Kansas City Motor Car Co.

SPRINGFIELD—

Automobile Agents and Dealers. Atkinson, J. E. (Cadillac.)

TARKIO—

Automobile Agents and Dealers.

Tarkio Electric & Water Co. (Pope-Waverley, Waltham.) Repairing.

Garages.

Tarkio Automobile Co.

Repairing, Automobile.

Tarkio Electric & Water Co. (Pope-Waverley, Waltham.)

WESTBORO—

Automobile Agents and Dealers.

Shackelford & Leffordge Auto Co. (Jackson.)

WEST PLAINS—

Automobile Agents and Dealers.

Indianapolis Motor Car Co. (Dragon, Logan.)

Garages.

Smith, P.

WHITESVILLE—

Automobile Agents and Dealers. Gebhart, E. (Holsman.)

MONTANA

ANACONDA—

Automobile Agents and Dealers.

Scott, D. C. (Pope-Hartford.)

BILLINGS—

Automobile Agents and Dealers.

Allen, Dr. Will. (Wayne.)

MONTANA (Continued)

Babcock Hardware Co., A. L. (Dragon.)

Blair, C. M. (White.)

Van Fenen & Co., The. (Winton.)

Garages.

Rowley, H.

BUTTE—

Automobile Agents and Dealers.

Dudley, S. W.—108 E. Broadway. (White.)

Montana Garage Co. (Glide.)

DRUMMOND—

Automobile Agents and Dealers.

Royal, P. P. (Waltham.)

GREAT FALLS—

Automobile Agents and Dealers.

Whitten, B. D. (Holsman.)

Garages.

Forest & Monk.—115 Central Ave.

HELENA—

Automobile Agents and Dealers.

Hahn, S. A. D. (Cadillac.)

Hansen Machine Works.—Helena Ave. (Cadillac.)

Mitchell, A. D. (Mitchell.)

State Novelty Works.—324 Fuller St. (Rambler.)

KALISPELL—

Automobile Agents and Dealers.

Bjorneby, Eliot. (Waltham.)

MISSOULA—

Automobile Agents and Dealers.

McDougal, Natt. (Buick.)

NEBRASKA

AURORA—

Automobile Agents and Dealers.

Aurora Automobile Co. (Mitchell.)

Dahl & Sons. (Reo.)

Dorland, W. G. (Pope.)

BEATRICE—

Automobile Agents and Dealers.

Jones, C. (Oldsmobile.)

Mayer, J. W. (Holsman.)

Garages.

Dempster Mill Mfg. Co.

BLOOMFIELD—

Automobile Agents and Dealers.

Barg & Co., Wm. (Holsman.)

COLUMBUS—

Garages.

Gerrard, C. L.

ELGIN—

Automobile Agents and Dealers.

Peterson, Dr. W. A. (Holsman.)

FRANKLIN—

Garages.

Hildreth, P.

FREMONT—

Automobile Agents and Dealers.

Cuddeback, E. R.—124 E. 4th St. (Standard-Dayton, Reo, Ford, Marion, Premier.) Garage and repairing.

NEBRASKA (Continued)

Garages.

Cuddeback, E. R.—124 E. 4th St. (Stoddard-Dayton, Reo, Ford, Marion, Premier.) Repairing.

Repairing, Automobile.

Cuddeback, E. R.—124 E. 4th St. (Stoddard-Dayton, Reo, Ford, Marion, Premier.) Garage.

GRAND ISLAND—

Repairing, Automobile.

Clinger, E. E.

HASTINGS—

Automobile Agents and Dealers.

Hedge, E. P.—107 Lincoln Ave. (Cadillac.)

Jones & Brandes.—109 Burlington Ave. (Premier, Reo.)

Garages.

Hastings Imp. Co.

HOLDREGE—

Automobile Agents and Dealers.

Paddock, W. H. (Maxwell.)

Garages.

Jorgensen, Chris.

HOOPER—

Automobile Agents and Dealers.

Monnich, B. (Holsman.)

HUMBOLDT—

Parts and Accessories Manufacturers.

Slama Tire Protector Co. Anti-skid devices, tire chains, tire treads.

KENESAW—

Automobile Agents and Dealers.

Schiegel, C. G. (Waltham.)

LEIGH—

Automobile Agents and Dealers.

Kloppel, C. O. (Waltham.)

LINCOLN—

Automobile Agents and Dealers.

Coon, Wm.—13th St. (Maxwell, Reo.)

Eby Mfg. Co. (Dragon.)

Girard Cycle Co. (Queen.)

Lincoln Auto Co. (Winton, Maxwell.)

Moore Auto Co. (Monarch.)

Olson, Oscar L. (Waltham.)

Shore & Beach. (Glide, Lambert.)

Sidles Automobile Co., H. E.—13th and P Sts. (Buick, Cadillac, Woods.)

Wittman Co., The.—205 S. 11th St. (Pope.)

Garages.

Mockett Auto Co., E.

Motorcycle Agents and Dealers.

Girard Cycle Co. (Indian.)

Parts and Accessories Manufacturers.

Cushman Motor Co.—2020 N St. Marine and automobile motors, propellers, carbureters and sprayers.

McCOOK—

Automobile Agents and Dealers.

McCook Auto Co.—308 W. Denison St. (Mason, Waltham.) Garage, repairing.

NEBRASKA (Continued)

Garages.

McCook Auto Co.—308 W. Denison St. (Mason, Holsman, Waltham.) Repairing.

Repairing, Automobile.

McCook Auto Co.—308 W. Denison St. (Mason, Waltham.) Garage.

MILLARD—

Automobile Agents and Dealers.

Petern Bros. (Rambler.)

MILLIGAN—

Automobile Agents and Dealers.

Placek, F. A. (Waltham.)

MINDEN—

Automobile Agents and Dealers.

Hove & Co., C. (Earl.)

NORFOLK—

Automobile Agents and Dealers.

Bullock, E. A.—112 S. 7th St. (Waltham.) Garage, repairing.

Garages.

Bullock, E. A.—112 S. 7th St. (Waltham.) Repairing.

Repairing, Automobile.

Bullock, E. A.—112 S. 7th St. (Waltham.) Garage.

NEBRASKA CITY—

Automobile Agents and Dealers.

Duff & Gregg. (Rapid.)

OMAHA—

Automobile Agents and Dealers.

Bergers Automobile Co.—2025 Farnam St. (Wayne, Auburn.)

Deere Plow Co., John. (Moline.)

Deright Auto Co.—1816 Farnam St. (Stoddard-Dayton, Ford, Mason, Premier, Rapid.)

Frederickson, H. E.—2046-48 Farnham St. (Buick, Haynes, Woods, Pierce-Arrow.)

Karbach Auto & Vehicle Co.—13th and Howard Sts. (Jewel.)

Kimball, R. R.—2026 Farnam St. (Stevens-Duryea.)

Larsen, J. M. (Acme.)

Louk & Compton.—1808 Farnam St. (Maxwell.)

Mutual Supply Co. (Monarch.)

Powell Automobile Co. (Baker, Cadillac, Franklin, White.)

Rambler Automobile Co.—2044 Farnam St. (Mitchell.)

Rambler Automobile Co.—1506 Capitol Ave. (Rambler.)

Automobile Manufacturers, Gasoline, Commercial.

Karbach Automobile & Vehicle Co.

Garages.

Automobile Service Co.—1812 Harney St.

McKay, R. E.

Omaha Auto Tire Co.—2210 Farnam St.

NEBRASKA (Continued)

Motorcycle Agents and Dealers.

Flescher, Louis.—1622 Capitol Ave. (Indian.)

Parts and Accessories Manufacturers.

Badecker Gas Engine Co. Gasoline automobile motors, gasoline marine motors.

Karbach Automobile & Vehicle Co. Wood and metallic bodies, automobile tops.

ORD—

Automobile Agents and Dealers.

Capron, J. H. (Cartercar.)

RED CLOUD—

Automobile Agents and Dealers.

Paterson, Jas. (Mitchell.)

SUTTON—

Automobile Agents and Dealers.

Grosshaus, L. (Waltham.)

YUTAN—

Automobile Agents and Dealers.

Hulhorst, F. (Waltham.)

NEVADA

GOLDFIELD—

Automobile Agents and Dealers.

Nevada Automobile & Supply Co.—115 Ramsey St. (Pope-Toledo, Northern.)

RENO—

Automobile Agents and Dealers.

Freeman, E. J. (National.)

Lundy, C. A. (Pope-Toledo, Franklin, Dorris.)

Reno Garage.—Cor. Lake and 2d Sts. (Pope-Toledo, Franklin.)

ROCKVILLE—

Automobile Agents and Dealers.

Smelzer, W. M. (Waltham.)

TONOPAH—

Automobile Agents and Dealers.

Bassford, B. E. (Maxwell.)

Fishbeck, Fred. (Chadwick.)

Hutzkan, H. T. (Simplex, Isotta-Fraschini, Thomas, Oldsmobile.) Garage, repairing.

Renfro's Garage & Supply House. (American.)

Garages.

Hutzkan, H. T. (Simplex, Isotta-Fraschini, Thomas, Oldsmobile.) Repairing.

Lothrop-Davis Co.—105 Main St. Repairing.

Repairing, Automobile.

Hutzkan, H. T. (Simplex, Isotta-Fraschini, Thomas, Oldsmobile.) Garage.

Lothrop-Davis Co.—105 Main St. Garage.

NEW HAMPSHIRE

BERLIN—

Automobile Agents and Dealers.

Berlin Automobile Garage. (Cameron.)

Garages.

Gilbert, John B.

BRETTON WOODS—

Garages.

Lemont, B. A.

CLAREMONT—

Automobile Agents and Dealers.

Jewett's Garage.—58 Pleasant St. (Rambler, Maxwell.) Garage, repairs, supplies.

Garages.

Jewett's Garage.—58 Pleasant St. (Rambler, Maxwell.) Repairing, supplies.

Repairing, Automobile.

Jewett's Garage.—58 Pleasant St. (Rambler, Maxwell.) Garage, supplies.

Supplies, Automobile.

Jewett's Garage.—58 Pleasant St. (Rambler, Maxwell.) Garage, repairs.

CONCORD—

Automobile Agents and Dealers.

French, O. J. (Waltham.)

Parker & Co., F. R. (Cadillac.)

Sanborn, Frank W.—176 N. Main St. (Rambler.)

Garages.

Albin, H. A.—152 N. Main St.

Johnson, Fred. L.—86 N. Main St.

Official A. A. A. Blue Book Station. Repairing, supplies.

Worthen, J. H. W.—24 Fayette St.

Parts and Accessories Manufacturers.

Whitney Electrical Instrument Co. Ammeters, voltmeters.

Repairing, Automobile.

Official A. A. A. Blue Book Station. Supplies, garage.

Supplies, Automobile.

Official A. A. A. Blue Book Station. Garage, repairing.

DOVER—

Automobile Agents and Dealers.

Doran, H. W. (Rambler.)

Smart & Son, Eugene.—459 Central Ave. (Stanley.)

Wentworth Auto Station.—Central Ave. (Reo, Premier, Wayne.) Repairing, garage.

Garages.

Wentworth Auto Station.—Central Ave. (Reo, Premier, Wayne.) Repairing.

Repairing, Automobile.

Wentworth Auto Station.—Central Ave. (Reo, Premier, Wayne.) Garage.

NEW HAMPSHIRE (Continued)

ENFIELD—

Automobile Agents and Dealers.

Chase, J. M. (Jackson.)

EXETER—

Clubs and Associations.

New Hampshire Automobile Club.

FRANKLIN FALLS—

Automobile Agents and Dealers.

Leach, E. W. (Pope-Hartford.)

Garages.

Prescott, Jr., B. M.—Main St.

GORHAM—

Automobile Agents and Dealers.

Noyes, H. G. (Jackson.)

HAMPTON—

Parts and Accessories Manufacturers.

Atlas Mfg. Co. Crank shafts, hampers.

KEENE—

Automobile Agents and Dealers.

Keene Auto Cycle Co. (Maxwell.)

Porter, Walter R. (Elmore.)

Robertson & Bennett. (Stanley, Rambler.)

LACONIA—

Parts and Accessories Manufacturers.

Esty, Wm.—59 Mill St. Steam engines.

LEBANON—

Automobile Agents and Dealers.

Jackson, C. A. (Maxwell.)

Parts and Accessories Manufacturers.

Kendrick & Davis. Magnetos, ignition dynamos, electric motors.

LITTLETON—

Automobile Agents and Dealers.

Smith, G. W. (Buick, Cadillac.)

MADISON—

Garages.

Silver Lake House Garage.

MANCHESTER—

Clubs and Associations.

Granite State Automobile Club.

Automobile Agents and Dealers.

Brodie Electric Co.—42 Pleasant St. (Pope-Waverley.)

Hadlock, W. Y.—15 N. Main St. (Rambler, Queen.) Garage, repairs, supplies.

Manchester Auto Garage.—92 W. Central St. (Buick, Columbia, Oldsmobile.)

Maxwell Auto Agency. (Maxwell.)

Sullivan's Auto Garage.—16-18 Myrtle St. (Reo, Ford.)

Wellman, J. A. (Rauch & Lang.)

Garages.

Automobile Station.—42-48 Pleasant St. Repairs, supplies.

Central Automobile Shop.—19 N. May St.

Dumas Automobile Exchange, The.—15 Prospect St.

Emerson, F. H.—118 William St.

NEW HAMPSHIRE (Continued)

Fitchburg Auto School & Garage Co.

—841 Elm St.

Hadlock, W. Y.—15 N. Main St.

(Rambler, Queen.) Repairs, supplies.

Parts and Accessories Manufacturers.

Cast Iron Brazing & Mfg. Co. Braziers and brazing compounds.

Repairing, Automobile.

Automobile Station.—42-48 Pleasant St. Supplies, garage.

Hadlock, W. Y.—15 N. Main St. (Rambler, Queen.) Supplies, garage.

Supplies, Automobile.

Automobile Station.—42-48 Pleasant St. Garage, repairing.

Hadlock, W. Y.—15 N. Main St. (Rambler, Queen.) Garage, repairing.

NASHUA—

Automobile Agents and Dealers.

Hartman & Co., Ltd.—230 Main St. (Franklin.)

Lintot, H. C.—45 Main St. (Reo.)

Pollard Auto Station.—230 Main St. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, Cadillac.) Repairing, garage.

Garages.

Pollard Auto Station.—230 Main St. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, Cadillac.) Repairing.

Repairing, Automobile.

Pollard Auto Station.—230 Main St. (Stevens-Duryea, Pope-Hartford, Pope-Waverley, Cadillac.) Garage.

PENACOOK—

Automobile Agents and Dealers.

Hout, Dr. A. H. (Elmore.)

PETERBORO—

Garages.

White Garage.

PORTSMOUTH—

Automobile Agents and Dealers.

Beacham & Son, R. Harry.—Fleet St. (Stevens-Duryea.) Garage and repairing.

Chadwick & Co., G. B.—11 Post St. (Lambert.)

Morrill Motor Car Co., E. C.—5 Raitts Court. (Premier.)

Portsmouth Garage, The.—Fleet St. (Stevens-Duryea.)

Weaver, H. C. (Maxwell.)

Woods, Wm. F. & Chas. E.—18 Congress St. (Cadillac.)

Garages.

Beacham & Son, R. Harry.—Fleet St. Stevens-Duryea.) Repairing.

Rockingham Auto Garage.—13 Vaughan St.

Repairing, Automobile.

Beacham & Son, R. Harry.—Fleet St. (Stevens-Duryea.) Garage.

NEW HAMPSHIRE (Continued)

ROCHESTER—

Repairing, Automobile.
Rochester Garage.

WEST DERRY—

Garages.
Abbott's Garage.—Abbott's Square.

WEST OSSIPPEE—

Automobile Agents and Dealers.
Lord, Dr. L. W. (Maxwell.)

NEW JERSEY

ASBURY PARK—

Clubs and Associations.
Monmouth Automobile Club.—Geo.
W. Pittenger, Sec.

Garages.

Embley & Co., W. W.—614 Main St.
Kerr, I. N.—Main St. and Asbury
Ave.

Monmouth Garage.—Heck St. and
Lake Ave.

Motor Tallyho Co.

Taylor & Ascher.—408 Main St.

Zacharias, C. R.—Main St. and Se-
wall Ave. Eagle Hall Garage, re-
pairing.

Parts and Accessories Manufacturers.
Electrical & Mechanical Develop-
ment Co. Soldering sticks, electri-
cal rectifiers.

Repairing, Automobile.

Guy, Mark.

Zacharias, C. R.—Main St. and Se-
wall Ave. Eagle Hall Garage.

ATLANTIC CITY—

Automobile Agents and Dealers.

Atlantic Auto Co. & Machine Works.
—Garage, N. Carolina Ave. (Premier,
Delaunay-Belleville, Mitchell.)

Corkran, H. W.—12 S. Maryland Ave.
(Columbus, Autocar.)

Johnson's Garage.—Atlantic and Ohio
Aves. (Winton.)

Mathis, C. W.—Arkansas and Arctic
Aves. (Cadillac.)

Mulock's Belmont Garage.—13-15 S.
Carolina Ave. (Wayne, Rambler,
Pullman.) Garage, repairing.

Quaker City Auto Co.—Ohio and At-
lantic Aves. (Maxwell.)

Shreve, E. G. (Waltham.)

Garages.

Chelsea Garage.—California Ave.

Corkran & Meloney.—12 S. Maryland
Ave.

Henkelman, J.—1724 Atlantic Ave.
Repairing.

Mulock's Belmont Garage.—13-15 S.
Carolina Ave. (Wayne, Rambler,
Pullman.) Repairing.

Thompson's Chelsea Garage.—Cali-
fornia Ave.

Repairing, Automobile.

Henkelman, J.—1724 Atlantic Ave.
Garage.

NEW JERSEY (Continued)

Mulock's Belmont Garage.—13-15 S.
Carolina Ave. (Wayne, Rambler,
Pullman.) Garage.

BAYONNE—

Automobile Manufacturers, Gasolene.
Crane & Whitman.

Motorboat Manufacturers.

Electric Launch Co., The.

Parts and Accessories Manufacturers.

Crane & Whitman Co.—94-104 W. 7th
St. Machine work to order.

Safety Insulated Wire and Cable Co.,
The. Rubber covered, lead covered
and armored cables.

BELLEVILLE—

Parts and Accessories Manufacturers.
Eck Dynamo Motor Co. Electric
generators.

ELMAR—

Automobile Agents and Dealers.

Newman, O. H. (Maxwell.)

Garages.

Pyott, A. M.

Wildman's Auto Garage.

BERNARDSVILLE—

Garages.

Sharp, I. H.—Main St.

BLOOMFIELD—

Automobile Agents and Dealers.

Central Motor Car Co.—Washington
and Franklin Sts. (Mitchell, Jack-
son.) Garage, repairing.

Heyer, Arthur P. (Haynes.)

**Automobile Manufacturers, Gasolene
Commercial.**

Torbensen Motor Car Co.

Garages.

Central Motor Car Co.—Washington
and Franklin Sts. (Mitchell, Jack-
son.) Repairing.

Parts and Accessories Manufacturers.

Delta Mfg. Co. Dry batteries, spark
plugs.

Repairing, Automobile.

Central Motor Car Co.—Washington
and Franklin Sts. (Jackson, Mitch-
ell.) Garage.

BOONTON—

Automobile Agents and Dealers.

Van Allen, W. C.—Mechanic St. (Reo,
Cadillac.)

BORDENTOWN—

Parts and Accessories Manufacturers.

Rice, & Co., John V., Jr. Marine
motors.

BRANCHPORT—

Motorboat Manufacturers.

Seaman, Wm. A.

BRIDGETON—

Automobile Agents and Dealers.

Hahn & Hahn. (Ford.)

Homer Cycle Co. (Cadillac.)

Schwartz & Co., J. I.—c/r W. H. Gar-
rison.—53½ E. Commerce St. (Rap-
id.)

NEW JERSEY (Continued)

Garages.

Service, W. E.

CALDWELL—

Automobile Agents and Dealers.

Heller, F. L. (Lambert.)

CAMDEN—

Automobile Agents and Dealers.

Albertson, C. C.—540 Washington St. (Autocar.)

Camden Auto Exchange.—58-60 N. Second St. (Dragon.)

Camden Auto Supply Co.—437 Broadway. (Dragon.)

Middleton, A. C.—44 Corteret St. (Rambler.)

Palace Garage.—540 Washington St. (Cadillac, Autocar.)

Automobile Manufacturers, Gasolene.

Matthews Motor Co.

Garages.

Mick's Automobile Garage.—58 N. 2d St.

Reeves Auto Station.—7th and Market Sts.

Motorboat Manufacturers.

Godshalk & Co., E. H.

Parts and Accessories Manufacturers.

Beringer, Geo. N.—5th and Federal Sts. Anti-freezing solution.

Borne-Scrymser Co. Grease, oils, semi-solid oil.

Hollingshead Co., R. M. Automobile body polishes, automobile body soaps.

Jones Motor Co., Geo. H.—Sixth St. Machine work to order.

Morton Marine Motor Co.—3d and Milton Sts. Marine motors.

New Jersey Asbestos Co. Gaskets, packing.

CARTERET—

Automobile Agents and Dealers.

Roosevelt Auto Co., Inc., The. (Knox.)

COLLINGSWOOD—

Automobile Agents and Dealers.

Hall, C. R. (Cadillac.)

DOVER—

Automobile Agents and Dealers.

Dover Garage Co.—74 E. Blackwell St. (Rambler, Jackson, Rapid, Holman.) Garage, repairing.

Garages.

Dover Garage Co.—74 E. Blackwell St. (Rambler, Jackson, Rapid, Holman.) Repairing.

Repairing, Automobile.

Dover Garage Co.—74 E. Blackwell St. (Rambler, Jackson, Rapid, Holman.) Garage.

EAST ORANGE—

Automobile Agents and Dealers.

Koehler Sporting Goods Co., H. J.—43 Harrison St. (Pope-Waverley, Pope-Toledo.)

NEW JERSEY (Continued)

Rickey Machine Co.—92 Eaton Place. (Marmon.)

White Co., The.—484 Main St. (White.) Repairing.

White Garage.—19 Railroad Place. (White.)

Garages.

North End Motor Car Co.—292 N. Park St.

North Jersey Motor Car Co., The.—25 Washington Place.

Snyder & Co.—20 Railroad Place.

Repairing, Automobile.

White Co., The.—484 Main St. (White.)

ELIZABETH—

Automobile Agents and Dealers.

Elizabeth Motor Car Co.—14 Westfield Ave. (Maxwell, Rambler.)

Sterling Garage & Auto Co.—Prince St. (Winton.)

Automobile Manufacturers, Steam Commercial.

Tractor Co., The.—3d and Trumbull Sts.

Garages.

Reed & Co., S. L.—25 Westfield Ave.

Motorcycle Agents and Dealers.

Elizabeth Motor & Cycle Co.—16 Julian Place. (Indian.)

ENGLEWOOD—

Automobile Agents and Dealers.

Bates, Geo. A. (Cadillac.)

Van Wart's Garage.—46 Palisade Ave., nr. Grand. (Reo, Maxwell, Studebaker, Crawford.) Garage, repairing.

Varley, W. P.—Van Brunt St. (Franklin.)

Garages.

Van Wart's Garage.—46 Palisade Ave., nr. Grand. (Reo, Maxwell, Studebaker, Crawford.) Repairing.

Repairing, Automobile.

Van Wart's Garage.—46 Palisade Ave., nr. Grand. (Reo, Maxwell, Studebaker, Crawford.) Garage.

FLEMINGTON—

Automobile Agents and Dealers.

Fulper, W. H. (Dolson.)

FREEHOLD—

Automobile Agents and Dealers.

Bawden, Jr., John H. (Rambler.)

Parts and Accessories Manufacturers.

Buck, L. K. Tire valves.

GARFIELD—

Garages.

Kunkle & Co., E.

HACKENSACK—

Automobile Agents and Dealers.

Hackensack Auto Co.—Main St. (Maxwell.)

North Jersey Auto & Eng. Co., Inc. (Mercedes, Winton.)

NEW JERSEY (Continued)

Garages.

Newman Bros.—134 Main St.

Parts and Accessories Manufacturers.

Lackawanna Leather Co. Leather.

HAMBURG—

Automobile Agents and Dealers.

Bloom, A. J. (Waltham.)

HAMMONTON—

Automobile Agents and Dealers.

Bellevue Automobile Station. (Cadillac.)

HARRISON—

Automobile Agents and Dealers.

Butler, T. J.—Harrison Ave., Nr. 5th St. (Cadillac.)

Motor Boat Manufacturers.

Marine Eng. & Machine Co.

Parts and Accessories Manufacturers.

Hyatt Roller Bearing Co.—427 Middlesex St. Roller bearings, transmission gears.

Semi-Dry Battery Co., The.—Fifth and Essex Sts. Cells and batteries.

Storey Motor & Electric Co.—32 Sussex St. Electric motors.

HIGHBRIDGE—

Automobile Agents and Dealers.

Trimmer, Dr. E. D. (Maxwell.)

HIGHLANDS—

Garages.

Kinsey & Dobbins.

HIGHTSTOWN—

Automobile Agents and Dealers.

Franklin, Wm. H. (Dragon.)

Norton, R. D. (Maxwell.) Garage.

Garages.

Norton, R. D. (Maxwell.)

HOBOKEN—

Automobile Agents and Dealers.

Dragon Auto Garage of Hudson Co. 1318 Park Ave. (Dragon.)

Hudson Automobile Garage.—1318 Park Ave. (Reo, Ford.)

Garages.

Meyer, V. F.—520 Washington St.

Parts and Accessories Manufacturers.

Diezemann Shock Absorber Co.—1311 Hudson St. Shock absorbers.

Funk Engineering Co.—39-45 14th St. Automobile forgings, crank shafts, gear blanks, chrome nickel steel, axles, steering knuckles, connecting rods.

New York Wire & Spring Co. Seat springs.

JERSEY CITY—

Clubs and Associations.

Automobile Club of Hudson County. —Clinton and Crescent Aves.

Automobile Agents and Dealers.

Clark, Jr., I. M.—136 Bowers St. (Waltham.)

Crescent Automobile Co.—2565 Boulevard. (Cadillac, Pope-Hartford, Pope-Toledo.) Garage, repairing.

NEW JERSEY (Continued)

Homan, E.—Boulevard, nr Lembeck Ave. (Rambler, National.)

Hudson County Auto Co.—2593 Blvd. (Matheson, Winton.)

Nelson, S.—12 Park St. (Compound.)

Romaine, D. W.—Mercer and Brunswick Sts. (Marion.)

Rose, E. B.—537 Mercer St. (Maxwell.)

Smith, Wm.—2395 Boulevard. (Wayne, Rapid.)

Wolverton, Thos. C.—537-539 Mercer St. (Maxwell.)

Automobile Manufacturers, Gasolene Commercial.

Mercantile Motor Co.

Garages.

Bergen & West Side Auto Co.—2535 Hudson Blvd.

Boulevard Automobile Garage.—2975 Boulevard.

Crescent Automobile Co.—2565 Boulevard. (Cadillac, Pope-Hartford, Pope-Toledo.) Repairing.

Keeney, E. P.—Boulevard and Cottage Sts.

Rockland Machine & Foundry Co.—42 Morris St.

Motorboat Manufacturers.

Standard Motor Construction Co.—180 Whiton St.

Motorcycle Manufacturers.

Pioneer Motor Cycle Co.—290 Grove St.

Parts and Accessories Manufacturers.

Autocoil Co., The.—136 7th St. Ignition apparatus, spark coils.

Dixon Crucible Co., Jos. Brazing compound, crank shafts, graphite, grease, oils.

Eastern Carbon Works.—W. Bergen. Ammeters, voltmeters, primary batteries, wire terminals, carbon specialties, carbon brushes.

Gillespie & Sons, Chas. H.—125 Dey St. Varnishes.

Kells Mfg. Co., W. J. Dashes, fenders, hoods, mufflers, radiators.

Mack Mfg. Co., Thos. A.—401-417 St. Paul Ave. Screw machine products, stampings.

New Jersey Car Spring & Rubber Co. —Wayne and Brunswick Sts. Hose couplings, gaskets, rubber mats, packing, rubber tubing, washers.

Presto Detachable Rim. —Lincoln Trust Bldg., Room 403. Detachable rims.

Smooth-on Mfg. Co.—572 Communi-paw Ave. Gaskets, packing.

Standard Motor Construction Co.—180 Whiton St. Marine motors.

United States Coil Co.—Spark coils, spark plugs.

NEW JERSEY (Continued)

Vorhees Rubber Mfg. Co.—Bostwick Ave. Cellular tires.

William & Son, E. A.—107 Plymouth St. Babbitt metals, bushings, crank cases, engine cases, bearings, aluminum, brass and bronze castings.

Repairing, Automobile.

Crescent Automobile Co.—2565 Boulevard. (Cadillac, Pope-Hartford, Pope-Toledo.) Garage.

KENILWORTH—

Parts and Accessories Manufacturers.
American Veneer Co. Mud guards, dashboards.

LAKE HOPATCONG—

Automobile Agents and Dealers.

King, A. A. (Ford.) Repairing, garage.

Garages.

King, A. A. (Ford.) Repairing.

Repairing, Automobile.

King, A. A. (Ford.) Garage.

LAKEWOOD—

Automobile Agents and Dealers.

Hoff, Jos. B.—106-118 Main St. (American, Mercedes, Locomobile, Pope-Waverley, Columbia.) Garage, repairing.

Garages.

Hoff, Jos. B.—106-118 Main St. (American, Mercedes, Locomobile, Pope-Waverley, Columbia.) Repairing.

Lakewood Auto Garage.—106 Main St.

Repairing, Automobile.

Hoff, Jos. B.—106-118 Main St. (American, Mercedes, Locomobile, Pope-Waverley, Columbia.) Garage.

LONG BRANCH—

Automobile Agents and Dealers.

Driscoll, M. A.—Washington St. and Broadway. (Smith.)

Lippincott, Z. (Waltham.)

Long Branch Auto Co. (Matheson.)

Martin's Garage. (Cadillac.)

Garages.

Parker & Co., W. H.—148 Broadway.

West End Garage, The.

Young's Auto Garage.

MADISON—

Garages.

Watson, Isaac.—Upper King's Road.

MARION—

Automobile Manufacturers, Gasolene Commercial.

Commercial Motor Co.

MILLTOWN—

Parts and Accessories Manufacturers.

Michelin Tire Co. Tires and accessories.

MONTCLAIR—

Clubs and Associations.

Riding, Driving and Automobile Club.

NEW JERSEY (Continued)

Automobile Agents and Dealers.

Greene Motor Car Co.—654-658 Bloomfield Ave. (Locomobile, Oldsmobile, Royal.) Garage, repairing.

Hever, A. P.—34 Valley Road. (Haynes.)

Shutt, W. H.—373 Bloomfield Ave. (Buick, Corbin, Pope-Waverley.)

Garages.

Greene Motor Car Co.—654-658 Bloomfield Ave. (Locomobile, Oldsmobile, Royal.) Repairing.

Henke, W. O.—Greenwood Ave.

Koehler Sporting Goods Co.—Bloomfield Ave.

Montclair Auto Station.—Bloomfield Ave. and Valley Road.

Repairing, Automobile.

Greene Motor Car Co.—654-658 Bloomfield Ave. (Locomobile, Oldsmobile, Royal.) Garage.

MORRISTOWN—

Automobile Agents and Dealers.

Dutton Co., W. H.—24 Washington St. (Oldsmobile, Royal.)

Trowbridge, F. A.—17 South St. (Reo, Premier.) Garage, repairing.

Wiss & Bros., Victor A.—12 Pine St. (Cadillac.)

Wurth, Louis J.—26 William St. (Mitchell.)

Garages.

Lowe's Auto Garage.—Pine and Morris Sts.

Trowbridge, F. A.—17 South St. (Reo, Premier.) Repairing.

Parts and Accessories Manufacturers.

Thousand Island Boat & Engine Co.—Marine motors.

Repairing, Automobile.

Trowbridge, F. A.—17 South St. (Reo, Premier.) Garage.

NEWARK—

Clubs and Associations.

Motor and Accessories Mfrs.—P. S. Steenstrup, Sec.; c/r Hyatt Roller Bearing Co.

New Jersey Automobile and Motor Club.—H. A. Bonnell, Sec.; 1034 Broad St.

Automobile Agents and Dealers.

Austin Automobile Co., The.—484 Broad St. (Ford.)

Boland Motor Co., F. E.—239 Halsey St. (National.)

Calvert-Zuzi Auto Co.—215 Clinton Ave. (Winton.)

Coburn & Beldon.—577 Central Ave. (Rainier.)

Cooper, Chas. S.—254 Clifton Ave. (Atlas.)

Dorris Co. of N. J.—21 Clinton St. (Dorris.)

Eastern Exchange.—87 Orange St. (Gale.)

NEW JERSEY—Newark (Continued)

Eichorn & Black.—9 Hill St. (Crawford.)
 Ellis Motor Car Co.—222 Halsey St. (Pierce Arrow.)
 Essex Auto Co.—518 Broad St. (Jackson.)
 Garrabrant, Arthur L. (Haynes.)
 Gathout, Chas. W.—160 Broad St. (Jackson.)
 Greene Motor Car Co.—90 Washington St.; 654-658 Bloomfield Ave., Montclair, N. J. (Locomobile, Oldsmobile.) Garage, repairing.
 Houpt, Harry S.—213 Clinton Ave. (Thomas Flyer.)
 Jeffrey & Co., Thos B.—3 Marshall St. (Rambler.)
 Joo, Raymond S.—79 Orange St. (Frayer-Miller.)
 Koehler Sporting Goods Co.—845 Broad St. (Buick, Corbin, Pope-Waverley.) Repairs, garage, supplies.
 Landsden Co., The.—54 Lackawanna Ave. (Electric, Wagon.)
 Linkroum-Smelser Automobile Co., The.—17 Bank St. (Lozier.)
 Livesey-Pionnie Motor Car Co.—136 S. 11th St. (Dolson.)
 Mason, Jacob W.—283-285 Halsey St. (Maxwell.)
 Matheson Co. of New Jersey, The.—9 Clinton St. (Matheson.)
 Merritt & Simpson.—35 Arlington Ave. (Waltham.)
 Motor Car Co. of N. J.—285-293 Halsey St. (Autocar, Cadillac, Packard.) Supplies, electric charging, garage, repairs.
 Newark Motor Car Co.—126-128 S. 14th St. (Wayne, Reo, Premier.)
 New Jersey Automobile Co.—855-857 Springfield Ave. (Moline, Aerocar.) Garage, repairing.
 New Jersey Motor Co.—49-51 Bank St. (Ford.)
 Oathout, Chas. W.—160 Broad St. (Jackson.)
 Page & Co., Carl. (Peerless.)
 Peerless Garage Co.—Room 321 Union Bldg. (Peerless.)
 Pope Auto Co.—Cedar and Halsey Sts. (Pope-Hartford.)
 Quinby & Co., J. M.—27 Division St. (Renault, Panhard.)
 Roseville Motor Co., The.—620 Orange St. (Dragon, Pope-Waverley, Compound.)
 Shutt, W. H.—845 Broad St. (Corbin, Buick, Pope-Waverley.)
 South End Automobile Co., The.—7 Wright St. (Walter.)
 Star Motor Car Co.—226 Halsey St. (Pullman.)

NEW JERSEY—Newark (Continued)

Automobile Manufacturers, Electric.
 Lansden Co., The.—54 Lackawanna Ave.
Automobile Manufacturers, Electric Commercial.
 Lansden Co., The.
Electric Charging.
 Motor Car Co. of N. J.—289-293 Halsey St. (Autocar, Cadillac, Packard.) Supplies, garage, repairing.
Garages.
 Astor Garage.—56 Sherman Ave.
 Burtt & Co.—346 Halsey St.
 Coryell, R. S.—Union Bldg., Clinton St.
 Greene Motor Car Co.—90 Washington St. (Locomobile, Oldsmobile.) Repairing.
 Jones, Henry P.—31 Waeman Ave.
 Koehler Sporting Goods Co.—845 Broad St. (Buick, Corbin, Pope-Waverley.) Supplies, repairs.
 Kinsey & Dobbins.—129 Riverside Ave.
 McElroy, T.—139 Walnut Ave.
 Mora Motor Car Co.
 Motor Car Co. of N. J.—289-293 Halsey St. (Autocar, Packard, Cadillac.) Electric charging, supplies.
 Motor Vehicle Co.—518 Broad St.
 Newark Repair & Garage Co.—213 Clinton Ave.
 New Jersey Auto Car Co.—226 Halsey St.
 New Jersey Automobile Co.—855-857 Springfield Ave. (Moline, Aerocar.) Repairing.
 New Jersey Vulcanizing Co.—83 Halsey St.
 Ranney & Co., A. Elliott.—237 Halsey St.
 Reo Automobile Co.—283 Halsey St.
 Wehrfreitz & Waldo.—150 Mulberry St.
Motorboat Manufacturers.
 Seitz Co., F. A.—141 Frelinghuysen Ave.
Motorcycle Agents and Dealers.
 Koehler Sporting Goods Co.—845 Broad St. (Indian.)
***Parts and Accessories Manufacturers.**
 American Platinum Works.—251 N. J. R. R. Ave. Platinum sparking points.
 Armitage & Co., John L. Varnishes.
 Atha Steel Co. Steel castings.
 Atha Tool Co., The. Tools.
 Auto Appliance Co.—24 Mechanic St. Spark plugs, timers, electric switches, electric lock switches.
 Baker & Co., Inc.—408-414 N. J. R. R. Ave. Platinum sparking points.
 Barlow Foundry Co., The.—28 Orange St. Gray iron castings, malleable iron castings.

NEW JERSEY—Newark (Continued)

Breeze Carbureter Co.—276 Halsey St. Carbureters and fuel strainers.
 Briscoe Mfg. Co. Tool boxes, waste cans, dashes, fenders, hoods, mufflers, radiators, brass and copper tubing, tanks.
 Caffrey Leather Co., M.—Frelinghuy-
 sen Ave. and Meeker St. Leather.
 Chambers & Ainslee.—2 Commercial
 St. Brass fittings and specialties.
 Champion Mfg. Co.—9-15 Alling St.
 Mufflers.
 Crosel mire & Ackor Co.—42 Walnut
 St. Platinum, platinum and iridium
 wire.
 Delaney & Son, D.—Liberty and
 Hamilton Sts. Leaf springs.
 Domestic Sewing Machine Co.—War-
 ren and High Sts. *Gray iron cast-
 ings.
 Eberhardt Bros. Machine Co.—66-68
 Union St. Metal gear wheels, spe-
 cial automobile machinery.
 Flood and Conklin Co.—136 Chestnut
 St. Varnishes.
 Gould and Eberhardt.—99 N. J. R. R.
 Ave. Special automobile machinery.
 Greacon & Co., Walter.—12 Mechanic
 St. License numbers, name plates.
 Halsey & Smith, J. H.—Shipman and
 Springfield Ave. Leather.
 Harper Co., Walter J.—229-231 Mul-
 berry St. Bow separators, top
 bows, lamp brackets, lamp covers,
 robe rails, tire holders, top fixtures,
 metal trimmings.
 Hebb, George A.—70 William St. Ma-
 chinery springs, seat springs.
 Holmes & Co., J.—518 Broad St.
 Body irons.
 Howell & Co., T. P. Leather.
 Jeffrey-Dewitt Co.—219 High St.
 Spark plugs.
 Jersey Brake Co.—93 Green St. Jacks.
 Jones, Phineas, & Co.—30 Market St.
 Wood rims, wood wheels.
 Landau, Henry W.—117 Green St.
 Fire extinguishers.
 Lawrence & Co., L. Wood and metal-
 lic bodies.
 Lippincott Steam Specialty & Supply
 Co. Machine works to order, screw
 machine products, power driven tire
 inflators, flexible tubing.
 Lockwood Co.—34 Mechanic St.
 Lamps.
 McCormick & Sons, E. H.—Ave. C
 and Vanderpool St. Leather.
 Manufacturers Can Co.—132-136 Mul-
 berry St. Oil cans, tanks.
 Meeker Foundry Co.—95 Clay St.
 Gray iron castings, malleable iron
 castings.

NEW JERSEY—Newark (Continued)

Murphy Varnish Co.—Chestnut and
 McWharther Sts. Varnish, colors in
 japan.
 National Lock Washer Co.—65-89
 Johnson St. Lock'nuts and washers.
 National Oil & Supply Co. Grease,
 transmission gear compound, oil.
 New Jersey Aluminum Co.—19th and
 Springfield Aves. Aluminum, brass,
 bronze and copper castings, license
 numbers, tire holders, tire irons.
 New Jersey Tube Co. Exhaust horns,
 brass and copper tubings.
 O-U-T-O Co.—19 Camfield St. Oils.
 Patent Leather Co. of America, The.
 Leather.
 Positive Lock Washer Co. Lock
 nuts and washers.
 Quinby & Co., J. M.—21-39 Division
 St. Aluminum bodies, tops, storm
 covers, complete chassis, wood and
 metallic bodies.
 Radel Leather Mfg. Co.—Hamburg
 Place Road. Leather.
 Reilly & Son Co., R.—Passaic Ave.
 Leather.
 Riley-Klotz Mfg. Co.—17 Mulberry
 St. Horns.
 Riverside Steel Casting Co.—451-473
 Riverside Ave. Crucible steel cast-
 ings.
 Rossendale-Reddeway Belting & Hose
 Co. Brake bands.
 Ryman Co., H. L.—164 Market St.
 Drop forgings.
 Seitz Co., F. A.—141 Frelinghuysen
 Ave. Marine motors.
 Shaw Engineering & Mfg. Co.—216
 High St. Jacks.
 Sheppard, W. S.—22 Lawrence St.
 Greases, oils, semi-solid oils, auto
 body polishes, metal polishes.
 Sills-Eddy Mica Co. Mica.
 Strieby & Foote Co.—301 Ogden St.
 Drop forgings, steps.
 Storm Mfg. Co.—Foot of Centre St.
 Elevators for garages.
 Terwilliger-Stone Leather Co.—210
 New Jersey Railroad Ave. Leather.
 Uniform Steel Co. Steel castings.
 Ward & Co., E. S. Leather.
 Webb Mfg. Co.—60 Shipman St.
 Flexible shafts.
 Weston Electrical Instrument Co.—
 Waverly Park. Measuring instru-
 ments.
 Young, Orlando W.—180 Frelinghuy-
 sen Ave. Anti-freezing solutions,
 tire cement, grease, oils, metals, au-
 tomobile body soaps, repair kit.
 Publications.
 Auto Bulletin, The—821 Prudential
 Bldg. Pub. monthly.

NEW JERSEY—Newark (Continued)

Repairing, Automobile.

Forest Hill Garage.—Verona and Clinton Aves.

Greene Motor Car Co.—90 Washington St. (Locomobile, Oldsmobile.) Garage.

Highgrade Autocar Co.—9-11 Hill St.
Koehler Sporting Goods Co.—845 Broad St. (Buick, Corbin, Pope-Waverley.) Garage, supplies.

Motor Car Co. of N. J.—289-293 Halsey St. (Autocar, Cadillac, Packard.) Electric charging, garage, supplies.

New Jersey Automobile Co. (Moline, Aerocar.) Garage.

Rambler Motor Car Co.—Halsey and Crawford Sts.

Supplies, Automobile.

Koehler Sporting Goods Co.—845 Broad St. (Buick, Corbin, Pope-Waverley.) Garage, repairs.

Motor Car Co. of N. J.—289-293 Halsey St. (Autocar, Cadillac, Packard.) Electric charging, garage, repairing.

Vulcanizing.

Central Tire Co.—Central Ave. and Halsey St.

Rosenebeck, H.—242 Halsey St.

NEW BRUNSWICK—

Automobile Agents and Dealers.

Middlesex Motor Co.—George St. and Carroll Place. (Pope-Hartford.)

Garages.

Lee, Thomas. Outlet Rock.

Motorcycle Agents and Dealers.

Middlesex Motor Co.—George St. and Carroll Pl. (Indian.)

Parts and Accessories Manufacturers.

Potter Mfg. Co. Marine motors.

NEWTON—

Automobile Agents and Dealers.

Koyt. (Holsman.)

NORTH NEWARK—

Garages.

Dean, W. A.—427 Washington Ave.

ORANGE—

Automobile Agents and Dealers.

Orange Auto Garage.—Essex Ave. and R. R. Place. (Franklin, Pope-Hartford, Pope-Toledo.)

Garages.

Snyder & Co.

Parts and Accessories Manufacturers.

Edison Storage Battery Co. Primary and storage batteries.

PASSAIC—

Automobile Agents and Dealers.

Brown, Geo. DeWitt.—Howe Ave. and Prospect St. (Cadillac, Maxwell.)

Matheson Co. of N. J.—147 Main St. (Matheson.)

Passaic Motor Car Co.—147 Main Ave. (Pope-Waverley.)

NEW JERSEY (Continued)

Pearl Auto Repair Garage.—161 Main Ave. (Reo, Premier, Detroit.)

Garages.

Fairchild, H.

Parts and Accessories Manufacturers.

Victor Auto Tire Repair Co., The.—220 Madison St. Inner tire tubes.

Repairing, Automobile.

Victor Auto Tire Repair Co.—220 Madison St.

PATERSON—

Clubs and Associations.

North Jersey Automobile Club.—Robt. Beattie, Jr., Sec.

Automobile Agents and Dealers.

Auto Garage & Repair Co.—198 Ellison St. (Manhattan.)

Automobile Co., The.—195 Paterson St. (Winton, Waltham.)

Auto Shop, The.—448 Broadway. (Columbia, Stevens-Duryea, White.)

Ball, H. H.—93 Broadway. (Buckboard, Waltham.)

Brown & Schmidt.—10 Lee Place. (Rambler, Maxwell.)

Conover Motor Car Co., The.—Paterson and Ellison Sts. (Ford, Conover.)

Garlick Garage.—642 Madison Ave. (Mason.)

Hackett Motor Car Co.—218 Paterson St. ((Mack Bros. motor trucks.)

Howe Motor Car Co.—11 Park Ave. (Premier.)

Jew, Garlick.—642 Madison Ave. (Cadillac, Franklin, Haynes.)

Martin Dunning Auto Garage Co., The.—538 E. 18th St. (Pullman, Crawford.)

Paterson Auto Exchange.—10 Crosby Pl. (Cadillac, Haynes, Franklin.)

Paterson Vehicle Co.—257 Market St. (Jackson.)

Automobile Manufacturers, Gasolene.

Conover Motor Car Co., The.

Garages.

Hackett Motor Car Co.—218 Paterson St. (Mack Bros. Motor Trucks.)

Repairing.

Israel, Abe.—139 Broadway.

Parts and Accessories Manufacturers.

Conover Motor Car Co., The. Glass wind shields.

Garlick-Auto Prop. Co.—Madison Ave. and Broadway. Jacks.

Passaic Steel Co. Angle, channel and tee iron and steel.

Smith Machine Co., H.—51 Godwin St. Trunk racks, turntables.

Repairing, Automobile.

Hackett Motor Car Co.—218 Paterson St. (Mack Bros. Motor Trucks.) Garage.

NEW JERSEY (Continued)

Vulcanizing.

Paterson Auto Tire Repairing Co.—
198 Ellison St.
Sorenson, S.—208 Paterson St.

PAULSBORO—

Automobile Agents and Dealers.

Prasch, P. S.—Buck St. (Waltham.)

Motorboat Manufacturers.

Wright, W. G.

PERTH AMBOY—

Automobile Agents and Dealers.

Farrington, B. W. (Waltham.)

Martin, Fred. K. (Monarch.)

Sexton, C. A. (Maxwell.)

Garages.

Aschenberg, Wm.—Madison Ave.

Raritan Auto & Motor Co.

Motorboat Manufacturers.

Dutton Engineering Co.

Parts and Accessories Manufacturers.

Pardee Works, The C. Steel.

PHILLIPSBURG—

Parts and Accessories Manufacturers.

American Sheet Iron Co. Sheet iron
and steel.

PITMAN—

Automobile Agents and Dealers.

Lacy, E. L. (Ford.)

PLAINFIELD—

Clubs and Associations.

Union County Automobile Association.—W. H. P. Veysey, Sec.

Automobile Agents and Dealers.

Laing Mch. Auto & Repair Co.—416
Sycamore St. (Cadillac, Haynes,
Waltham.)

Maltby, W. S. (Corbin.)

Martin Automobile Co., F. L. C.—304
Park Ave. (Franklin, Mercedes,
Clement-Bayard, Stevens-Duryea.)

Morris Bros. Automobile Co.—149 E.
4th St. (Maxwell.)

Plainfield Motor Car Co.—214 Park
Ave. (Mitchell.)

Garages.

Thompson Automobile Co., Andrew
C.—413 Park Ave.

Tygard, James W.—920 South Ave.

Parts and Accessories Manufacturers.

B. & B. Co.—97 Rockview Ave. Wire
terminals.

Fulmer, C. F. Air compressors, spark
plugs, timers.

Rushmore Dynamo Works. Search-
lights, acetylene generators, sirens.

Spicer Universal Joint Mfg. Co.—3d
St. and Madison Ave. Spicer univer-
sal joints, generators, magnetos.
High tension.

PRINCETON—

Automobile Agents and Dealers.

Princeton Garage Co.—Nassau St.
(Maxwell.)

NEW JERSEY (Continued)

RAHWAY—

Automobile Agents and Dealers.

Boland & Bros., F. E.—Grand and
Oliver Sts. (National.)

Freeman, F. P.—Cor. Irving St. and
Elizabeth Ave. (Ford, Crawford.)

Automobile Manufacturers, Gasolene.

Eagle Automobile Co.

**Automobile Manufacturers, Steam
Commercial.**

Commercial Truck and Power Co.—
171 Main St.

Parts and Accessories Manufacturers.

Dunham & Son, D. B. Bodies, tops,
slip covers.

New Jersey Steel Co. Steel castings.

Tingley & Co., Chas. O. Tire cement,
tire patches, tire plugs.

RED BANK—

Automobile Agents and Dealers.

Mount & Bros., J. W. (Autocar, Cad-
illac, Detroit.) Repairing.

Sandt, Geo. M.—333 Broad St. (Max-
well.)

Garages.

Guyon, H. A.—62 Broad St.

Van Dorn, Fred. H.—31 E. Front St.

Van Kattengell, Edw.—Monmouth St.
and Maple Ave.

Parts and Accessories Manufacturers.

Mount & Bros., J. W. Bodies, tops.

Repairing, Automobile.

Mount & Bros., J. W. (Autocar, Cad-
illac, Detroit.)

RIVERSIDE—

Automobile Agents and Dealers.

McCoy, Geo. A. (Cadillac.)

ROCKAWAY—

Automobile Agents and Dealers.

Perkins Auto Co.—Main St. (Corbin.)
Repairing, garage.

Garages.

Perkins Auto Co.—Main St. (Corbin.)
Repairing.

Repairing, Automobile.

Perkins Auto Co.—Main St. (Corbin.)
Garage.

RUTHERFORD—

Garages.

Lumund, Joseph.—11 Union Ave.

Parts and Accessories Manufacturers.

Electric Rubber Mfg. Co. Inner tire
tubes.

SEABRIGHT—

Garages.

Bentell, O. F.

Brennan, William.—Church St. Re-
pairing.

Repairing, Automobile.

Brennan, William.—Church St. Gar-
age.

SOMERVILLE—

Automobile Agents and Dealers.

Garretson Auto & Cycle Co.—132
Main St. (Franklin, Oldsmobile.)

NEW JERSEY (Continued)

SOUTH ORANGE—

Automobile Agents and Dealers.

Erskine & Hall. (Rambler.)

Repairing, Automobile.

Mead, W. L.—275 Ridgewood Road.

SPOTSWOOD—

Automobile Agents and Dealers.

Appleby & Dill. (Maxwell.)

Outcalt Mfg. Co. (Dragon.)

SUMMIT—

Automobile Agents and Dealers.

Apgar, M. H. (Maxwell.)

Henry, Chester C. (Pope-Hartford.)

Summit Garage.—Union Place, Opp. depot. (Reo.)

Summit Motor Car Co.—Smithfield Ave. (Ford.)

TRENTON—

Clubs and Associations.

Associated Automobile Clubs of New Jersey.

Automobile Club of Trenton.

Mercer County Automobile Club.—W. F. Sadler, Jr., Sec.

Automobile Agents and Dealers.

Hammerstrom Rubber Mfg. Co., F. N. (Dragon.)

Motor Car Specialty Co.—147 E. State St. (Maxwell.)

Richards Auto Garage.—321 E. State St. (Franklin, Pope-Hartford, Pope-Toledo.)

Throop & Sons Co., J. E. (Winton.)

Toman Bros. (Rambler.)

Trenton Electric Auto Garage. (Columbus.)

Automobile Manufacturers, Gasolene.
Walter Auto Co., The.

Garages.

Capital City Garage.—32 Chancery St.

Milton Co., Frank.—30 W. State St.

Trenton Auto & Supply Co.—130 N. Warren St.

Parts and Accessories Manufacturers.

Derby Mfg. Co. Carbureters.

Diamond Porcelain Co. Metal polishes.

Empire Automobile Tire Co. Tire cases, pump tire inflators, tire irons, tire patches, tire repair kits, inner tire tubes, pneumatic tires.

Empire Rubber Mfg. Co. Rubber mats, rubber cloth, rubber tubing.

Fitzgibbon & Crisp Carriage & Auto Body Co. Wood and metallic bodies, auto tops.

Fine, Horace E.—19 E. State St. Monograms, lamp numbers, license numbers, markers, straps.

Gould Derby Mfg. Co.—109 N. Broad St. Carbureters, shock absorbers.

NEW JERSEY (Continued)

Imperial Porcelain Works.—Mulberry St. Pumps, pressure regulator tanks, railings, handles, lamp brackets, hub caps, name plates, priming cups, gasolene cocks, pipe connections, brass work to order, insulators for spark plugs.

M'Farland Foundry & Machine Works. Marine reverse gears.

National Porcelain Co. Porcelain.

Radial Bearing Co.—508 Broad St. Bank Bldg. Radial bearings.

Standard China Works, Porcelain.

Star Porcelain Co. Porcelain.

Trenton Malleable Iron Co. Jacks, gasolene auto motors, tire irons.

Trenton Rubber Mfg. Co. Tire cement, rubber mats, tire patches, inner tire tubes.

UNION HILL—

Automobile Agents and Dealers.

Union Auto Co.—Bulls Ferry Rd. and Main St. (National, Rambler.)

VERNON—

Automobile Manufacturers, Gasolene Commercial.

Thomas Wagon Co., The.

VINELAND—

Automobile Agents and Dealers.

Blaisdell Mch. Works.—6th St. and C. R. R. of N. J. (Pope-Toledo.)

Garages.

Pearson, C. W.—625 Landis Ave.

WEEHAWKEN—

Automobile Agents and Dealers.

Palisade Auto Co.—Palisade Ave. and Hackensack Plank Rd. (Pope-Waverley, Cadillac, Peerless, Pope-Hartford.)

WEST HOBOKEN—

Automobile Agents and Dealers.

Graschoff, Albert W. (Pierce, Rambler.)

Garages.

Guenther, E. P.—High and Boulevard.

WESTFIELD—

Automobile Agents and Dealers.

Quackenbush Co., W. H. (Reo, Premier, Mitchell, Ford, Maxwell.)

WILDWOOD—

Clubs and Associations.

Motor Club of Wildwood.—H. L. Hamersley, Sec.

Automobile Agents and Dealers.

Newcomb Auto Co. (Cadillac.)

WOODBURY—

Automobile Agents and Dealers.

Wilson, A. S.—23 Cooper St. (Ford, Studebaker.)

Parts and Accessories Manufacturers.

Johnston Machine Co.—86 High St. Carbureters.

NEW MEXICO

ALBUQUERQUE—

Automobile Agents and Dealers.
Albuquerque Cycle & Arms Co.—
115 Gold St. (Winton, Waltham.)

CARLSBAD—

Automobile Agents and Dealers.
Ohnemus, R. & Acrey, C. M. (Holsman.)

ROSWELL—

Automobile Agents and Dealers.
Roswell Auto Co. (Buick, Pope-Toledo.)
Roswell Hdw. Co. (Maxwell.)
Pitts & Wiseley. (Lambert.) **Garages.**
Pitts & Wiseley. (Lambert.)

SILVER CITY—

Automobile Agents and Dealers.
Mongollon Motor Rd. Co. (Reo.)

NEW YORK

ADDISON—

Motorcycle Manufacturers.
Reliance Motor Cycle Co.

AKRON—

Automobile Agents and Dealers.
Mills & Peterson. (Lambert.)

ALBANY—

Clubs and Associations.
Albany Automobile Club.—C. D. Hakes, Sec.; 61 Lancaster St.
New York State Automobile Ass'n.
Automobile Agents and Dealers.
Albany Garage Co.—28-30 Howard St. (Peerless, Matheson, Isotta-Fraschini, Stevens-Duryea.) Supplies, garage, repairing.
Automobile Storage & Trading Co.—97 Central Ave. (Columbia, Oldsmobile, Thomas Flyer.)
Central Automobile Co.—170 Central Ave. (Ford, Maxwell.)
Mohawk Valley Automobile Co. (Knox.)
Payne Co., Inc., John R. (Stearns.)
Schafer, Robert.—1112 Madison Ave. (Holsman.)
Sweeney Sporting Goods Co. (Waltham.)
Taylor Automobile Co., Inc.—33-35 Orange St. (Locomobile.) Garage, repairing.
Troy & Albany Auto Exchange.—State and Larke Sts. (Franklin.)
Waite, Geo. W. (Elmore.)
Garages.
Albany Garage Co.—28-30 Howard St. (Peerless, Matheson, Isotta-Fraschini, Stevens-Duryea.) Repairs, supplies.
Albany Hardware & Iron Co.—42 State St. Supplies.
Beebe, Thos. S.—40 Tennis St.

NEW YORK (Continued)

Capital City Automobile Works.—22 Plain St.
Downey & Bingham.—159 Jay St.
Hassell Wagon & Harness Co.—Broadway and Hudson Ave.
Kemp Machine Wks., J. N.—887 Main St.
Kingsbury, John.—133 Hudson Ave.
Kramrath, H.—25 Plain St.
Long, L. Y.—524 Madison Ave.
Rahway Appliance Mfg. Co.—12 Plain St.
Schade, Henry.—323 Central Ave.
Shafer, R.
Taylor Automobile Co., Inc.—33-35 Orange St. (Locomobile.) Repairing.
Motorcycle Agents and Dealers.
Anderson, F. W.—467 Madison Ave. (Indian.)
Parts and Accessories Manufacturers.
Clark, John W. Brass, bronze, aluminum and copper castings, and bronze metals.
Goold Co., James. Wood and metallic bodies.
National Casket Co. Lap robes, rain coats, auto heaters.
Weeber Mfg. Wks., C. F. Mufflers, shock absorbers.
Repairing, Automobile.
Albany Garage Co.—28-30 Howard St. (Peerless, Isotta-Fraschini, Stevens-Duryea, Matheson.) Supplies, garage.
Taylor Automobile Co., Inc.—33-35 Orange St. (Locomobile.) Garage.
Supplies, Automobile.
Albany Garage Co.—28-30 Howard St. (Peerless, Matheson, Isotta-Fraschini, Stevens-Duryea.) Garage, repairing.
Albany Hardware & Iron Co.—42 State St. Garage.
Vulcanizing.
Kelsey & Kelsey.—25 Hamilton St.
ALLEGANY—
Garages.
Willard, Clare.
AMITYVILLE—
Automobile Agents and Dealers.
Dittman, Christian.—Main St. and Broadway. (Maxwell, Cadillac.)
AMSTERDAM—
Automobile Agents and Dealers.
Daye, William S.—Division St. (Waltham.)
Greene & Warnick.—Stewart St. (Pope-Toledo, Stevens-Duryea.) Garage, repairing, supplies.
Smeallie Bros.—10 Division St. (Franklin.)
Automobile Manufacturers, Steam.
Terwilliger & Co., Wm. B.—32 Division St.

NEW YORK (Continued)

Garages.

Greene & Warnick.—Stewart St. (Pope-Toledo, Stevens-Duryea.) Repairing, supplies.

Parts and Accessories Manufacturers.
Shuler & Son, Davis W. Leaf springs. Repairing, Automobile.

Greene & Warnick.—Stewart St. (Pope-Toledo, Stevens-Duryea.) Supplies, garage.

Supplies, Automobile.

Greene & Warnick.—Stewart St. (Pope-Toledo, Stevens-Duryea.) Garage, repairing.

ARVERNE—

Automobile Agents and Dealers.

Arverne Automobile Garage. (Glide.)

AUBURN—

Clubs and Associations.

Automobile Club of Auburn.—Dr. G. W. Whitney, Sec.

Automobile Agents and Dealers.

Auburn Automobile Co.—Water St. (Franklin, Pope-Hartford, Royal, Peerless, Northern.) Supplies, garage, repairing.

Tallman Stables.—17 Dill St. (Ramblor.)

Garages.

Auburn Automobile Co.—Water St. (Franklin, Pope-Hartford, Royal, Peerless, Northern.) Repairing, supplies.

Leather & Brass Mfg. Co.—24 Water St.

Parts and Accessories Manufacturers.
Black Hills Mica Co. Mica.

Bowen Mfg. Co.—Canal St. Oil cups, oil hole covers, leather washers, strips and shapes, plain compressors, grease cups, felt washers.

Clapp Mfg. Co., E. D., The. Drop forgings.

Eccles Co., Richard.—Clark and S. Division Sts. Vehicle forgings.

Leather & Brass Mfg. Co.—24-26 E. Genesee St. Air compressors, tire pumps, jacks.

Repairing, Automobile.

Auburn Automobile Co.—Water St. (Franklin, Pope-Hartford, Royal, Peerless, Northern.) Supplies, garage.

Supplies, Automobile.

Auburn Automobile Co.—Water St. (Franklin, Pope-Hartford, Royal, Peerless, Northern.) Repairing, garage.

BABYLON—

Automobile Agents and Dealers.

Weeks, C. M. (Cadillac.)

BALDWINVILLE—

Penn Spring Works. Automobile springs.

NEW YORK (Continued)

BALLSTON SPA—

Automobile Agents and Dealers.

West, Jr., Geo. (Simplex.)

Garages.

West's Garage.—Cor. Milton Ave. and Front St. Repairing.

Repairing Automobile.

West's Garage.—Cor. Milton Ave. and Front St. Garage.

BANGOR—

Garages.

Arnold, W. H.

BATAVIA—

Automobile Agents and Dealers.

Hills & Kennedy.—24 Main St. (Maxwell.)

Paige, E. W.—46 Washington Ave. (Ford.)

Thomas & Bros., G. P. (Waltham, Pierce.)

Parts and Accessories Manufacturers.

Batavia Rubber Tire Co. Solid tires.

Kibbe, C. S. Wearing apparel, caps, gloves and gauntlets.

Sweet Tire & Rubber Co., The. Solid tires.

Repairing, Automobile.

Batavia Machine Co., The.—24 Main St. Supplies.

Supplies, Automobile.

Batavia Machine Co., The.—24 Main St. Repairing.

BATH—

Garages.

Ellas, Charles A.

Klickler, Frank.

Parts and Accessories Manufacturers.

Kirkham Motor Mfg. Co. Clutches, transmission gears, gasoline auto motors.

BAY SHORE, LONG ISLAND—

Garages.

Parkway Garage Co.

Rhodes, H. C.—East Main St. Supplies.

Supplies, Automobile.

Rhodes, H. C.—E. Main St. Garage.

BINGHAMTON—

Clubs and Associations.

Binghamton Automobile Club.—S. M. Frechie, Sec.

Automobile Agents and Dealers.

Binghamton Motor Car Co.—172-176 State St. (Pope-Toledo, Pope-Hartford, Buick, Columbia, Knox, Pierce Arrow.)

Clinton Auto Co., H. D. (Matheson.) Clinton, Louis R.—17 Carhart St. (Thomas Flyer.)

Doherty, H. B.—24 Wall St. (Cadillac, Franklin, Darracq, American Mercedes.) Repairing, garage.

Heller, L. L.—1015 Kilmer Bldg. (Marmon.)

NEW YORK (Continued)

Heller-Spawm Motor Car Co. (Marmon.)

Kinney & Alexander. (Holsman.)

Lewis, S. H. (Maxwell.)

Sterling Motor Car Co.—180-184

Water St. (Ford, Marmon, Jackson.) Garage, repairing.

White Agency, The.—176 State St. (White.)

Garages.

Doherty, H. B.—24 Wall St. (Cadillac, Franklin, Darracq, American Mercedes.) Repairing.

Sterling Motor Car Co.—180-184 Water St. (Ford, Marmon, Jackson.) Repairing.

Titchiner, C. E.

Parts and Accessories Manufacturers.

Hancock & Heller.—184-190 Water St. Tire tools.

Hoffman Lubricating Oil Co. Oils.

Smith, Craig & Davidge.—174 Water St. Miscellaneous wearing apparel.

Smith Storage Battery Co.—198 State St. Storage batteries.

Snow & Co., N. H. Auto tops.

Sterling Alternating Ignition Co.—184 Water St. Timers, spark coils, alternating current ignition devices.

Tray Plate Battery Co. Storage batteries, electric automobiles, spark batteries.

Whipple, R. W.—169 State St. Brakes, Jacks, auto seats, Dos-a-Dos seats.

Repairing, Automobile.

Doherty, H. B.—24 Wall St. (Cadillac, Franklin, Darracq, American Mercedes.) Garage.

Sterling Motor Car Co.—180-184 Water St. (Ford, Marmon, Jackson.) Garage.

BOONVILLE—

Automobile Agents and Dealers.

Babcock, J. P. (Waltham.)

BREWERTON—

Motorboat Manufacturers.

Milton, T. M.

BRONXVILLE—

Clubs and Associations.

Bronxville Automobile Club.—Harry Burt, Sec.

Garages.

Gramatan Garage.

BROOKLYN—

Clubs and Associations.

Long Island Automobile Club.—R. A. Field, Sec.

Automobile Agents and Dealers.

Allen Co., I. M., The.—116 S. Portland Ave. (Stevens-Duryea.)

Auto Maintenance Co.—1239 Fulton St. (Dolson.)

Bishop, McCormick & Bishop.—Halsey St., nr. Bedford Ave. (Dragon, Ford.)

NEW YORK—Brooklyn (Continued)

Blaisdell, Walter F.—58 Palmetto St. (Walter.)

Brooklyn Auto & Garage Co. (Reo, Moline.)

Brooklyn Motor Car Co.—1386 Bedford Ave. (Oldsmobile.)

Campbell Corwin Co.—902 Union St. (De Luxe.)

Carlson Auto Garage.—1060 Bedford Ave. (Winton.)

Carlton Garage & Repair Co.—St. Marks and Vanderbilt Ave. (Deere.)

Coffin Bros.—515 Greene Ave. (Pierce-Racine.)

Curtis Auto Co.—70 Albany Ave. (Franklin.)

Eclipse Auto & Construction Co.—101-107 S. 6th St. (Smith.)

Fink, August D.—58 Palmetto St. (Haynes.)

Flatbush Automobile Co. (Deere.)

Flatbush Motor Car Co.—44-48 Snyder Ave. (Corbin, Columbus.) Garage, repairing.

Imperial Garage.—664 Halsey St. (Rambler.)

Jackson Motor Car Co.—103 Court St. (Jackson.) Repairing, garage.

Kirkham, I. C.—Fulton St. and Bedford Ave. (Maxwell.)

Mack Bros. Mfg. Co.—540 Atlantic Ave. (Manhattan.)

Martin, W. C.—1001 Bedford Ave. (Rolls-Royce.)

Mears, J. W.—7 Ocean Parkway. (Acme.)

New Amsterdam Motor Co. (Crawford.)

Ormond Automobile Co.—2 Jefferson Ave. (Columbia gasoline and electric.) Garage, repairing.

Park Garage. (Walter.)

Pastre's, Ellis, Automobile Garage.—Ocean Parkway, cor. Sherman St. (National, Rambler.)

Peerless Garage.—942-944 Bedford Ave. (Peerless.) Repairing, garage.

Plaza Automobile Co.—918 Union St. (Reo, Premier.)

Prospect Park S. Garage.—Coney Island and Church Aves. (Crawford.)

Remsen Mfg. Co., I. S., The.—754 Bedford Ave. (Locomobile.)

Smith & Jordan.—231 Flatbush Ave.—10 Clinton St., charging station;

811 Union St. (Pope-Hartford, Pope-Toledo, Pope-Waverley.)

Smith, C. R. (Frayer-Miller.)

Southworth, A. G.—342 Flatbush Ave. and 10 Clinton St. (Pope-Toledo, Pope-Hartford, Pope-Waverley.) Repairing.

Storms & Sherwood.—1421 Bedford Ave. (Aerocar.)

NEW YORK—Brooklyn (Continued)

Teves & Hendricks.—411 Berry St. (Smith.)
 Tollner & Sons, Hugo.—292 Taaffe Place. (Baker.)
 Townsend, Arthur R.—1148 Bedford Ave. (Knox.)
 Wayne Garage.—33 Grant Sq. (Wayne.)
 White Co., The.—1380 Bedford Ave. (White.)
 Williamsburg Auto & Storage Co.—159-161 Clymer St. (Autocar.) Garage.
 Williamson, W. S.—220 Clifton Pl. (Holsman.)
 Willink Garage.—Flatbush and Ocean Aves. (Marmon.)
Automobile Manufacturers, Steam Commercial.
 Columbia Engineering Works.—William and Emlay Sts.
Garages.
 Acme Garage.—443-445 Fourth St.
 Allsopp, James A.—331 Fourth St.
 Armstrong & Hunter.—356 13th St.
 Auto Garage Co.—701 Quincy St.
 Bedford Auto Garage.—220 Clinton Pl.
 Bedford Garage Co.—1287 Bedford Ave.
 Bennett, R. R.—267 Green Ave.
 Borough Automobile Co.—12 New York Ave. and 185 Herkimer St.
 Brooklyn Auto Exchange.—224 State St.
 Brooklyn Automobile Co.—12 New York Ave. and 185 Herkimer St.
 Burns Automobile Co., The.—31 Grant Sq.
 Bushwick Garage.—58-62 Palmetto St.
 Eagle Garage & Machine Co.—1907-1911 Cropsey Ave.
 Flager Company.
 Flatbush Motor Car Co.—44-48 Snyder Ave. (Corbin, Columbus.) Repairing.
 Gaillard's Auto Repair Station.—265 Havemeyer St.
 Grant Square Automobile Co.—1380 Bedford Ave.
 Hess Automobile Co.—701 Quincy St.
 Hoh Stahl Motor Co.—398 Bedford Ave.
 Hylton, Geo.—182½ Bedford Ave.
 Ideal Auto Garage.—862 Jefferson Ave.
 Jackson Motor Car Co.—103 Court St. (Jackson.) Repairing.
 Kensington Garage.—712-714 Coney Island Ave., nr. Ave. D.—Repairing, renting, supplies.
 Keystone Garage, The.—912 Bedford Ave.
 Kings Automobile Co.—1011 Greene Ave.

NEW YORK—Brooklyn (Continued)

Lewis Auto Co.—Lewis Ave. and Hancock St.
 Long Island Garage Co.—159 Reid Ave.
 Monroe Garage.—202 Monroe St.
 Ormond Automobile Co.—2 Jefferson Ave. (Columbia.) Repairing.
 Outing Automobile Co.—Flatbush and Ocean Aves.
 Park Circle Garage.—4-8 Ocean Parkway.
 Peerless Garage.—942-944 Bedford Ave. (Peerless.) Repairing.
 Pflieger, J.—1602 Bushwick Ave.
 Prospect Garage.—3 and 5 Prospect Park West.
 Pupki Garage.—488 Hancock St.
 Riding & Driving Club.—Prospect Park Plaza.
 Rutledge Garage.—100 Rutledge St.
 Sands Garage, H. B.—623 Bergen St.
 Schaaf Garage.—Fulton and Cumberland Sts.
 Seymour-Benn Co.—104 Jefferson Ave.
 Stuyvesant Heights Auto Co., The. 449 Madison St.
 Sutton, John W.—342-344 Flatbush Ave.; garage at 10-12 Clinton St. and 342-244 Flatbush Ave. Electric battery station, 811-813 Union St. Repairs, supplies.
 Union Automobile Co.—33 Grant Square.
 Union Garage.—784-786 Union St.
 Williamsburg Auto & Storage Co.—159-161 Clymer St. (Autocar.)
Instruction, Automobile.
 Y. M. C. A.—Bedford Branch.
Motorboat Manufacturers.
 Bay Ridge Launch Works.—Foot 39th St.
Motorcycle Agents and Dealers.
 Baker & Co., F. A.—1080 Bedford Ave. (Indian.)
Motorcycle Manufacturers.
 Prospect Motor Mfg. Co.—7-9 Park Place.
***Parts and Accessories Manufacturers.**
 American Steel Barrel Co.—204-206 Varet St. Tool boxes, gasoline tank gauges, storage tanks.
 Automobile Supply Mfg. Co.—139-147 American Pl. Tire cement, shields, horns, lamps, flexible tubing.
 Blanchard, A. W.—10 Clinton St. Tire tools.
 Booth, N. E.—743-745 39th St. Felt packings, dust rings, gaskets for automobiles, axles.
 Boyd, James.—73 39th St. Tanks.
 Briggs, W. H.—424 Bedford Ave. Wire terminals.
 Brooklyn Coil and Carbureter Co.—77-79 Adams St. Carbureters.

NEW YORK—Brooklyn (Continued)

Brooklyn Rubber Co.—397 Sumner Ave. Tire cement.
 Carlson, Chas. A.—1016 Bedford Ave. Marine motors.
 Chrome Steel Works. Steel castings. Cross, W. H.—18-20 Franklin St. Metal polish, and hand soap.
 Eckel, Andrew.—1080 3d Ave. Vaporizers.
 Fulton Foundry & Machine Works.—25 Turnam St. Gray iron castings, pattern makers.
 Generator Valve Co.—294-296 Taaffe Pl. Carbureters, spark plugs, vaporizers.
 Rothenbucher, Geo. E. R.—102 Hinsdale St. Tools and wrenches.
 Gill & Sons Forge and Machine Wks., P. H. Axles, connecting rods, gear blanks, crank shafts.
 Gilmer, Crowell.—292-296 Graham St. Air compressors.
 Hauch-Seebach Co.—291-295 Essex St. Acetylene generators, oil cans, oil guns, oil pumps.
 Hicks Speed Indicator Co.—1384 Bedford Ave. Speedometers.
 Ironclad Mfg. Co. Tanks, storage tanks.
 Jefferson Brass Foundry. Brass, bronze, aluminum and copper castings.
 Jordan, Jr., E. B.—873 Union St. Tool boxes.
 Kent Spark Plug Co.—1279 Bedford Ave. Spark plugs.
 Maltby Automobile & Mfg. Co. Brakes.
 Martin Evans Co.—1186 Bedford Ave. Tire cement, inner tire tubes, non-skids.
 Masury & Son, John W.—44-50 Jay St. Enamel, paints, varnishes.
 Miller & Van Winkel.—18 Bridge St. Machinery springs.
 N. Y. Gear Works.—56 Greenpoint Ave. Transmission gears, circulating pumps.
 Olmstead & Co., H. & B.—663 Manhattan Ave. Pattern makers.
 Oriental Varnish Co.—72 Midwood St. Varnishes.
 Pacific Tucking & Mfg. Co.—471-473 18th St. Pumps.
 Peerless Igniter Mfg. Co.—947 Marcy Ave. at Fulton St. Storage batteries.
 Shonberg, I.—363 Hudson Ave. Babbitt metals, bronze metals.
 Standard Valve Co.—163 Hawthorn Ave. Tire valves.
 United States Electro-Galvanizing Co.—1-9 Park Ave. Galvanizing.
 Weiss, Louis T.—286-290 Taaffe Place, Horns.

NEW YORK—Brooklyn (Continued)

Williams & Co., J. H.—150 Hamilton Ave. Crank shafts, valve stems, drop forgings, wrenches.
Renting.
 Ainslie, Geo.—1140 Dean St.
 Kensington Garage.—712-714 Coney Island Ave., nr. Ave. D. Supplies, garage, repairing.
Repairing, Automobile.
 Ball, Chas. A.—58-62 Palmetto St.
 Backe, T. A.—33 Herkimer Place.
 Busse, W. G.—478 Sumner Ave.
 Central Auto School.—238 W. 5th St.
 Cooper, I.—864 Bedford Ave. Repairing.
 Flatbush Motor Car Co.—44-48 Snyder Ave. (Corbin, Columbus.) Garage.
 Jackson Motor Car Co.—103 Court St. (Jackson.) Garage.
 Kensington Garage.—712-714 Coney Island Ave., nr. Ave. D. Garage, renting, supplies.
 Mercantile Motor Car Co.—368 Cumberland St.
 Ormond Automobile Co.—2 Jefferson Ave. (Columbia.) Garage.
 Peerless Garage.—942 Bedford Ave. (Peerless.) Garage.
 Southworth, A. G.—342 Flatbush Ave. and 10 Clinton St. (Pope-Toledo, Pope-Waverley, Pope-Hartford.)
 Sutton, John W.—342-344 Flatbush Ave.; 10-12 Clinton St. Electric battery station.—811-813 Union St. Supplies, garage.
Supplies, Automobile.
 Bindrim, Julius.—1057 Bedford Ave.
 Kensington Garage.—712-714 Coney Island Ave., nr. Ave. D. Garage, repairing, renting.
 Pacific Tucking & Mfg. Co.—471-473 18th St.
 Seagate Automobile Equipment Co.—1218 Bedford Ave.
 Sutton, John W.—342-344 Flatbush Ave.; 10-12 Clinton St. Electric battery station.—811-813 Union St. Garage, repairs.
Vulcanizing and Tire Repairing.
 Austin & Co., Robert.—227 Pacific St.
 Eclipse Auto Rubber Tire Repairing Co.—305 Clifton Pl.
 Oriental Rubber Co.—1140 Bedford Ave.
 Snowden, W. T.—786 Bedford Ave.
BUFFALO—
Clubs and Associations.
 Automobile Club of Buffalo.—D. H. Lewis, Sec.; Teck Theater Bldg.
 Buffalo Automobile Trade Ass'n.
Automobile Agents and Dealers.
 Barger, W. H.—32 Edward St. (Waltham.)

NEW YORK—Buffalo (Continued)

Binghamton Motor Car Co.—172-174-176 State St. (Pope-Toledo, Pope-Hartford, Buick, Columbia, Knox, Babcock.) Garage.
 Brunn's Carriage Manufactory.—1140 Main St. (Stevens-Duryea.)
 Buffalo Auto Exchange.—401 Franklin St. (Franklin.)
 Buffalo Motor Car Co.—437 Pearl St. (Autocar, Hotchkiss, Cartercar.) Supplies.
 Centaur Motor Co.—53-61 Franklin St. (Peerless, Pope-Toledo, Winton, Oldsmobile, Cadillac, Darracq.) Garage, repairing.
 Cramer, J. A.—737 Main St. (Stoddard-Dayton, Wayne, Mitchell.)
 Engel, Jr., Louis.—437 Pearl St. (Cartercar.)
 Ford Motor Co.—727 Main St. (Ford.)
 Haynes, Walter.—1116 Main St. (Jewel, White.) Supplies.
 Imperial Motor Co.—1094 Main St. (Buick, Packard, Pope-Hartford, Pope-Waverley.) Garage.
 Jaynes & Co., W. C.—721 Main St. (Royal, Knox.)
 Kane-Champlin Co., The.—Ellicott and Tupper Sts. (Premier, Reo.)
 Lewis, Jno. G. (American.)
 Maxwell-Briscoe Buffalo Co.—26-28 Goodrich St. (Maxwell, Mora.)
 Neal, Clark & Neal Co.—743 Main St. (Reliance.)
 Parkes, E. T.—Fidelity Bldg. (Autocar.)
 Pierce Co., Geo. N., The.—Salesroom and general office, 754 Main St. (Pierce Arrow.)
 Poppenberg Automobile Co.—674-676 Main St. (Rambler, Reo, Premier, Reliance.)
 Rogers, Clarence M.—1114 Main St. (Rapid.)
 Rossler Mfg. Co., C., The.—507 Ellicott St. (Rossler.)
 Thomas Motor Co., E. R.—1200 Niagara St. (Thomas.)
 White Automobile Agency.—1116 Main St. (White.) Garage, supplies.
Automobile Manufacturers, Electric.
 Babcock Electric Carriage Co.—226 W. Utica St.
Automobile Manufacturers, Electric Commercial.
 Auto-Car Equipment Co., Inc.—1453-1459 Niagara St.
Automobile Manufacturers, Gasolene.
 Ideal Runabout Mfg. Co.—105 Baynes St.
 Pierce Co., Geo. N., The.—1695 Elmwood Ave.; salesroom and general office, 754 Main St.

NEW YORK—Buffalo (Continued)

Sterling Engine Co.—119 Grant St.
 Thomas Motor Co., E. R.—1200 Niagara St.
Automobile Manufacturers, Gasolene Commercial.
 Auto-Car Equipment Co.—77-79 Edward St.
 Buffalo Auto-Truck & Motor Co.—35 Mississippi St.
Garages.
 Andrews, George.—437 Pearl St.
 Auburn Ave. Auto Station.—419 Auburn Ave.
 Auto Car Equipment Co., The.—77 Edward St. Supplies.
 Auto Car Garage.—38 Riley St.
 Auto Club Garage.—451 Vermont St.
 Auto Sight Seeing Co.—77 Edward St. Rental service.
 Baine, C. R.—1525 Seneca St.
 Binghamton Motor Car Co.—172-174-176 State St. (Pope-Toledo, Pope-Hartford, Buick, Columbia, Knox, Babcock.)
 Buffalo Auto Livery.—123 W. Eagle St.
 Buffalo Automobile Station.—240 W. Utica St.
 Buffalo Garage Co.—414 Ferry St., W.
 Centaur Motor Co.—53-61 Franklin St. (Peerless, Pope-Toledo, Winton, Oldsmobile, Cadillac, Darracq.)
 Cleland, H. W.—61 E. Swain St.
 Decker's, W. H.—95 Southampton St.
 Delaware Ave. Garage.—257 Delaware Ave.
 Derry, Thos.—466 Vermont St.
 Electric Charging Station.—200 Pearl St.
 Elmwood Garage.—189 Cleveland Ave.
 Franklin Garage.—347 Franklin St.
 Frontier Automobile Service.—437 Pearl St.
 Gibson, John J.—401 Franklin St.
 Imperial Motor Co.—1094 Main St. (Buick, Packard, Pope-Hartford, Pope-Waverley.)
 Kelsey Co.—42 Niagara St.
 National Battery Co.—368 Massachusetts St.
 Northern Garage.—77 Virginia Place.
 Norwood Garage.—121 Norwood Ave.
 O. K. Machine Wks.—887 Main St. Repairing, supplies.
 Penny, C. B.
 Reliable Auto Station.—49 E. Utica St.
 Richmond Auto & Storage Co.—27 Chenango St.
 Sackett, H. I.—256 Pearl St.
 Shaw-Brown Motor Co.—897 Main St.
 Standard Auto & Cycle Works.—41 Woodlawn Ave.
 Standard Garage Co.—1114 Main St.

NEW YORK—Buffalo (Continued)

Summey, C. E.—52 Gill Pl.
 Timmins & Butler.—286 Ellicott St.
 Utica Automobile Station.—22-24 W.
 Utica St. Repairs, supplies.
 White Automobile Agency.—1116 Main
 St. (White.) Supplies.
 White's, J. L.—419 Auburn St.
 Whittemore, C. C.—123 W. Eagle St.
Motorcycle Agents and Dealers.
 Neal, Clark & Neal Co.—643 Main St.
 (Indian.)

Motorcycle Manufacturers.

Thomas Auto-Bi Co.—1443 Niagara
 St.

***Parts and Accessories Manufacturers.**

Acme Steel & Malleable Iron Works.
 —245 Military Road. Steel and
 malleable iron castings.
 Allyn Brass Fdy. Co., The.—1095
 Niagara St. Brass castings.
 Annis Oil Co., N. L.—139 Potomac
 Ave. Grease, oils, auto body soaps.
 Auto Shine Co.—Box 94. Metal pol-
 ishes.
 Beals, Geo. C.—29 Erie Co. Bank
 Bldg. Iron and steel sheet and bar.
 Becker Glass & Paint Co.—372-378
 Pearl St. Paints.
 Benjamin Iron & Steel Co.—1102 D.
 S. Morgan Bldg. Sheet and bar
 iron and steel.
 Bickford & Francis Belting Co.—35
 Pearl St. Belting, packing.
 Boston Belting Co.—90 Pearl St.
 Belting.
 Bowen Motor Co.—419 Auburn Ave.
 Gasoline automobile motors.
 Brunn's Carriage Mfg. Co.—1140 Main
 St. Wood and metallic bodies.
 Buffalo Aluminum Co.—442 Ellicott
 Sq. Aluminum.
 Buffalo Auto Body & Trimming Co.
 —338 Ellicott St. Bodies, tops, up-
 holstering, wind shields.
 Buffalo Belting Works.—137 Wash-
 ington St. Belting.
 Buffalo Carbureter Co.—889 Main St.
 Carbureters.
 Buffalo Crucible Casting Co.—25
 Washington St. Steel castings.
 Buffalo Dental Mfg. Co.—587-589
 Main St. Brazing, blow pipes,
 hardening and tempering furnace.
 Buffalo Emery Wheel Co.—127 Ash
 St. Emery wheels.
 Buffalo Enamel & Stain Co.—481 Elli-
 cott Sq. Enamel, paints, auto body
 polishes, varnishes.
 Buffalo Engine Co.—12-20 Perry St.
 Gasoline auto motors.
 Buffalo Excelsior Machine Co.—Mili-
 tary Road. Steel balls.
 Buffalo Forge Co. Forge equipment.

NEW YORK—Buffalo (Continued)

Buffalo Foundry Co. Gray iron cast-
 ings.
 Buffalo Gasolene Motor Co.—1280-
 1290 Niagara St. Marine motors.
 Buffalo Mill Supply Co.—210-212 Main
 St. Belting, packing.
 Buffalo Rubber Mfg. Co.—Sussex Ave.
 and Erie R. R. Tire cement, tire
 treads, inner tire tubes.
 Buffalo Specialty Co.—3751-3777 Elli-
 cott Sq. Tire cement, auto body
 polishes, tire fluid.
 Buffalo Steel & Shafting Co.—Works,
 Ft. Baitz Ave. Steel.
 Buffalo Weaving & Belting Co.—234
 Chandler St. Belting.
 Cambria Steel Co.—440 Ellicott Sq.
 Steel.
 Carnegie Steel Co.—203 Ellicott Sq.
 Steel.
 Centaur Motor Co.—59 Franklin St.
 Tool boxes, steering wheels.
 Century Mfg. Co.—272 W. Genesee St.
 Paints, varnishes.
 Columbia Paint & Varnish Co.—12
 Sanford St. Paints.
 Continental Caoutchouc Co.—729 Main
 St. Tires.
 Cooper Process Co.—506 White Bldg.
 Paints.
 Crandall, Stone & Co. Bow sockets
 and fixtures.
 Crosby Co. Ball retainers, brake
 drums, ball cups, auto gear cases,
 hub caps, hub flanges, lamp brackets,
 pressed steel products, steel boiler
 shells, stampings, steps.
 Crucible Steel Co. of America.—67
 Carroll St. Steel.
 Davey Fire Guard Co.—399 Franklin
 St. Anti-skid devices.
 Day Foundry Co., The.—Illinois and
 Mary Sts. Brass, bronze, alumi-
 num and copper castings, bronze.
 metals.
 Deck Bros.—20 Indiana St. Brass
 castings.
 De Luxe Mfg. Co. Spark plugs.
 Denniston, E. E.—184 W. Mohawk St.
 Automobile tops.
 Detroit White Lead Works.—5 Ohio
 St. Paints, varnishes.
 Ducro Mfg. Co.—1778 Niagara St.
 Gasolene marine motors.
 Eastwood Wire Mfg. Co. Pipe, brass
 fittings, name plates.
 Empire State Tire Co. Tire pumps,
 repair vulcanizer, jacks, pneumatic
 tires, non-skids.
 Ernst's Sons, C. F.—75 Lathrop St.
 Turn tables.
 Fedders Mfg. Co.—57-59 Tonawanda
 St. Automobile radiators, tanks,
 hoods.

NEW YORK—Buffalo (Continued)

Firestone Tire & Rubber Co.—Ellicott and Tupper Sts. Tires.

Fisk Rubber Co.—718 Main St. Tires.
Forsythe Mfg. Co.—308 Terrace. Stampings.

Fries & Co.—89-93 Main St. Brass couplings, brass pipe fittings, brass and copper metals, aluminum castings, brass castings.

Garlock Packing Co., The.—534 Ellicott Sq. Packing.

General Drop Forge Co.—1738 Elwood Ave. Drop forgings.

General Mercantile Co.—905-906 Mutual Life Bldg. Belting.

Goodyear Tire & Rubber Co.—719 Main St. Tires.

Grinard Inserted Leather Auto Shoe Co. Tire shoes.

Guillott Gasket Co., Wm.—1108 West Ave. Packing.

Hall Co., Chas. E.—108 Broadway. Tools, stampings.

Hefter, Jos.—15 Oak Grove Ave. Paints.

Hill Mfg. Co. Tops, bodies, wind shields, removable seats.

Hofeller Brass Foundry Co.—100 Terrace. Brass, bronze, aluminum and copper castings.

Hosmer Co., G. A.—376 Ellicott St. Tire cement, oils.

Hosmer Co., G. A.—601-607 Northland Ave. Oils, grease, rubber cement.

Illinois Steel Co.—203 Ellicott Sq. Steel.

Jeseph & Co., W. R.—499 Clinton St. Annunciators.

Johnston, W. S.—806 White Bldg. Iron and steel sheet and bar.

Jones & Laughlin Steel Co.—1019 White Bldg. Iron and steel sheet and bar.

Keasbey Co., Robert A.—141 Ellicott St. Asbestos.

Keim Mills, Inc., John R.—Kensington Ave. and Erie Tracks. Brake drums, hubs, flanges, dust caps, brackets, discs, pressed metal products.

Kellogg, Geo. S.—Builders Exchange. Steel.

Koen, James R.—1257 Niagara St. Wood and metallic bodies.

Lackawanna Steel Co.—Hamburg Turnpike and Ridge Rd. Steel.

Liberty Brass Foundry.—1095 Niagara St. Brass castings.

Lobee Pump & Machinery Co.—Cor. Terrace and Erie Sts. Circulating and gear pumps.

NEW YORK—Buffalo (Continued)

Lumen Bearing Co.—Sycamore St. and Belt Line. Brass, bronze, aluminum and copper castings, Babbitt metals, bronze metals, solder, aluminum solder.

McDougall Varnish Co.—1317 Elk St. Varnish.

McKinnon Dash Co. License numbers.

Main Belting Co.—40 Pearl St. Belting.

Mey Chain Belting Works.—77 Washington St. Belting.

Mayer, H. F.—77 Washington St. Belting.

Mets Paint Co., P. A., The.—769 Clinton St. Paints.

Model Pattern Works.—Washington and Perry Sts. Pattern makers.

Moye Mfg. Co.—56 Lake View Ave. Radiators, hoods, dashes and tool boxes.

National Battery Co.—268-282 Massachusetts Ave. Storage ignition batteries, electric vehicles, storage batteries.

National Casket Co. Lap robes, raincoats, auto heaters.

National Construction Co.—604 Morgan Bldg. Portable houses.

National Corundum Wheel Co.—455 Ellicott St. Emery wheels.

New York Belting & Packing Co., Ltd.—600 Prudential Bldg. Belting.

New York State Steel Co.—475 Abbot Road. Steel.

New York State Steel Co.—1000 White Bldg. Steel.

Niagara Falls Brass Works, Inc.—146 Virginia St. Aluminum, brass and bronze castings.

Peerless Belting Co.—78 Main St. Belting.

Penfield & Co., A. B.—7 Terrace St. Asbestos.

Polson, W. F.—22 W. Utica St. Foot rests, robe rails, tire holders, tire tools, valve lifters, glass wind shields.

Pratt & Lambert.—79 Tonawanda St. Varnish.

Rippel Steel Foundry Co., E. G.—31-39 Indiana St. Steel castings.

Riverside Body Factory. Bodies.

Robson Smelting Co.—Broadway and Lathrop St. Babbitt metals.

Runschool Metal Co.—1095 Niagara St. Babbitt metals.

Seneca Iron and Steel Co.—53 Erie Co. Bank Bldg. Iron and steel sheet and bar.

Sherwin-Williams Co.—47 Pearl St. Paints.

NEW YORK—Buffalo (Continued)

Sherwood Mfg. Co.—Elmwood Ave. and Belt Line. Carbureters, brass, bronze, aluminum and copper castings, ejectors, grease cups, lubricators, oil cups, oil pumps.
 Smith, T. Guilford.—203 Ellicott Sq. Iron and steel sheet and bar.
 Standard Automobile Lubricator Co.—361-363 Ellicott St. Lubricators.
 Standard Foundry Co.—Jersey St. and Lakeview Ave. Gray iron castings.
 Sterling Engine Co.—119-121 Grant St. Marine motors.
 Swinehart Clincher Tire & Rubber Co.—893 Main St. Tires.
 Taylor Co., H. D.—101-105 Oak St. Curtain fasteners, metal trimmings.
 Throop Perforating Co.—80 Terrace. Body irons, transmission gears, metal gear wheels, machine works to order, perforated metal sprockets.
 Tonawanda Iron & Steel Co.—60 Erie Co. Bank Bldg. Sheet and bar iron and steel.
 Trout, H. G., King Iron Works.—226 Ohio St. Brass castings.
 Ulrich & Co. Metal polish.
 Unique Metal Co.—25 Illinois St. Brass, bronze, aluminum and copper castings.
 U. S. Steel Products Export Co.—203 Ellicott Sq. Steel.
 U. S. Cast Iron Pipe & Foundry Co.—280 Box Ave. Iron pipe.
 Wickwire Steel Co.—Plant Wireton (Rattlesnake Is.) Steel.
 Wickwire Steel Co.—Office, 1027 White Bldg. Steel.
 Willet Engine & Carbureter Co.—764 Ellicott Sq. Carbureters, auto motors, marine motors.
 Wright Motor Co.—48 S. Division St. Auto motors, marine motors.
 Zero Valve & Brass Mfg. Co.—419 Chicago St. Brass castings.
Repairing, Automobile.
 Buffalo Electroplating Co.—78 Oak St.
 Centaur Motor Co.—53-61 Franklin St. (Peerless, Pope-Toledo, Winton, Autocar, Oldsmobile, Cadillac, Darracq.) Garage.
 Modern Machine Co.—817 Washington St.
 O. K. Machine Wks.—887 Main St. Supplies, garage.
 Utica Automobile Station.—22-24 W. Utica St. Supplies, garage.
Supplies, Automobile.
 Auto Car Equipment Co., The.—77 Edward St. Garage.
 Buffalo Carbureter Co.—889 Main St.
 Buffalo Motor Car Co.—437 Pearl St. (Autocar, Hotchkiss, Cartecar.)
 Centaur Motor Co.—53-61 Franklin St.

NEW YORK—Buffalo (Continued)

Denniston, E. E.—184 W. Mohawk St.
 Diamond Rubber Co. of N. Y.—715 Main St. Tires.
 Eureka Supply Co.—230 Broadway.
 Excelsior Steel Ball Co.—Military Rd.
 Ferre, E. E.—379 Washington St.
 G. & J. Tire Agency.—9 W. Huron St. Tires.
 Haynes, Walter.—1116 Main St. (Jewel, White.)
 Jaynes Auto Supply Co.—806 Main St.
 Manzel Bros.—317 Babcock St.
 Mayer Carbureter Co.—2673 Main St.
 Michelin Tire Agency.—230 Broadway. Tires.
 Hayes, Walter.—1116 Main St. (Jewel.
 Miller, Chas. E.—824 Main St. Manufacturers, jobbers, exporters, importers.)
 Morgan & Wright.—379 Washington St. Tires.
 Machine Wks., W. K.—887 Main St. Garage, repairs.
 Pennsylvania Rubber Co.—717 Main St. Tires.
 Seaman's Auto Water Heaters.—448 Niagara St.
 Strauss & Mathew.—707 Main St.
 Strauss & Son, J.—197 E. Genesee St.
 Utica Automobile Station.—22-24 W. Utica St. Garage, repairing.
 Warner Inst. Co.—722 Main St.
 White Automobile Agency.—1116 Main St. (White.) Garage.
 Yates, Russel P.—887 Main St.

CAMBRIDGE—

Automobile Agents and Dealers.
 Barton & Day.—S. Union St. (Cameron.)

CANAJOHARIE—

Automobile Agents and Dealers.
 Burnap & Roser. (Atlas.)
Garages.
 Bullock, Wm.
 McCoukey, Frank.
 Wilson, F. H.—215 Seneca St.
Repairing, Automobile.
 Fixit Shop.—Moyer St.

CANANDAIGUA—

Garages.
 Hawley, Wm. J.—221 S. Main St.
 Henry, Walter M.—162 S. Main St.

CANASTOTA—

Automobile Agents and Dealers.
 Thompson, T. E. (Maxwell.)
Garages.
 Waverly Garage.—334 Waverly Ave.
Motorboat Manufacturers.
 Tuttle Co., D. M.
Parts and Accessories Manufacturers.
 Tuttle Co., D. M. Gasoline and marine motors.

CATSKILL—

Automobile Agents and Dealers.
 Golden, Percy. (Maxwell.)
 Post, Amos. (Franklin.)

NEW YORK (Continued)

Garages.

Wynkoop, Theodore.—406 Main St.
Motorboat Manufacturers.
 Benter, Worth S.

CENTRAL VALLEY—

Automobile Agents and Dealers.
 Weygant Sons, R. F. (Maxwell.)

CHATEAUGAY LAKE—

Motorboat Manufacturers.
 Bellows, M. S.

CHATHAM—

Repairing, Automobile.
 Abrams, Chas. E.

CHESTER—

Automobile Agents and Dealers.
 Murray, T. S. (Maxwell.)

CITY ISLAND—

Motorboat Manufacturers.
 Jacob, R.
 Wood, B. F.

CLAYTON—

Automobile Agents and Dealers.
 Johnson, Henry S. (Waltham.)

CLIFTON SPRINGS—

Parts and Accessories Manufacturers.
 Judd & Leland Mfg. Co.—Hibbard Ave. Circulating pumps, gauges, tire pumps, axles, nipples.

COBLESKILL—

Automobile Agents and Dealers.
 Dana, Howard. (Dolson.)

COHOES—

Clubs and Associations.
 Cohoes Automobile Club.—E. R. Clifton, Sec.
Automobile Agents and Dealers.
 Clute Bros.—49 Mohawk St. (Pope-Hartford, Pope-Waverley, Royal.)
Repairing.
 Smith Machine Co.—Van Rensselaer St. (Maxwell.)

Garages.

Cohoes Auto Storage & Repair Station.—42 Van Rensselaer St.
Repairing, Automobile.
 Clute Bros.—49 Mohawk St. (Pope-Waverley, Royal, Pope-Hartford.)

COLD SPRING—

Automobile Agents and Dealers.
 Post, E. L. (Waltham.)

COLLEGE POINT, LONG ISLAND—

Motorboat Manufacturers.
 Powell's Cove Boat & Engine Co.

CONEY ISLAND—

Motorboat Manufacturers.
 Brooklyn Launch Works.

COOPERSTOWN—

Garages.
 Crist, Scott & Parshall. **Repairing.**
Repairing, Automobile.
 Crist, Scott & Parshall. Garage.

COPENHAGEN—

Automobile Agents and Dealers.
 Tamblin, Dr. J. H. (Knox.)

NEW YORK (Continued)

CORNING—

Automobile Agents and Dealers.
 Corning Auto Co.—45 W. Market St. (Franklin, Cadillac, Holsman.)
 Kitts & Son, E. A. (Jackson.)

Garages.

Johnson, Ithuel M.—Main St. (Gibson Village.)
 Steuben Automobile Co.—92 E. Market St.

CORTLAND—

Automobile Agents and Dealers.
 Cortland Automobile Co.—151 S. Main St. (Cadillac, Franklin.)
 Cortland Specialty Co. (Maxwell.)
Automobile Manufacturers, Gasolene.
 Hatfield Motor Vehicle Co.

Garages.

City Cycle & Auto Co.—29 Railroad St. **Repairing.**

Parts and Accessories Manufacturers.
 Cortland Carriage Goods Co. Bow sockets and metal trimmings.

Cortland Forging Co. Bow sockets, drop forgings, top fixtures, metal trimmings.

Cortland Specialty Co.—176 Railroad St. **Brazing compound.**

Newton & Son, W. H.—127 Elm St. **Cushions, automobile tops.**

Repairing, Automobile.

City Cycle & Auto Co.—29 Railroad St. **Garage.**

DALTON—

Automobile Agents and Dealers.
 Wakeman, W. R. (Waltham.)

DANVILLE—

Automobile Manufacturers, Gasolene.
 Klink Motor Car Mfg. Co.

DELHI—

Parts and Accessories Manufacturers.
 Crawford, G. W. & H. D. Wood and metallic bodies.

DESPATCH—

Automobile Manufacturers, Gasolene.
 Selden Motor Vehicle Co.

DUNKIRK—

Automobile Agents and Dealers.
 Alling & Fields.—331 Lion St. (Maxwell.)

Garages.

Cole, S. R.—39 E. Third St.
 Fellows & Fay.—126 Central Ave.
 Hamilton Auto Co.—221 Eagle St.
 Hilton Machine Works.—16 E. Third St.

Shafer, Henry.—436 Lion St.

ELBRIDGE—

Parts and Accessories Manufacturers.
 Elbridge Electric Co.—Electric generators, magnetos and ignition dynamos, spark coils, spark plugs.

ELMIRA—

Clubs and Associations.
 Elmira Automobile Club.—F. H. Richardson, Pres.

NEW YORK (Continued)

Automobile Agents and Dealers.

Beach, J. A.—William and Market Sts. (Cadillac.)

Gallagher, J. C.—The Rathbun House. (Haynes.)

Gladke, Morris.—101 E. Water St. (Thomas Flyer.)

La France Motor Car Co.—451 E. Market St. (Corbin.)

Rhodes, John F.—109 Church St. (Waltham, Jackson.)

Ross, C. W. (Haynes.)

Smith, A. L. (Studebaker.)

Willys-Crew Motor Car Co.—119 Main St. (Rambler, White, Premier, Pope-Waverley, Ford, Detroit, American.) Garage, repairs, supplies.

Repairing, Automobile.

Willys-Crew Motor Car Co.—119 Main St. (Rambler, White, Premier, Pope-Waverley, Ford, Detroit, American.) Garage, supplies.

Supplies, Automobile.

Willys-Crew Motor Car Co.—119 Main St. (Rambler, White, Premier, Pope-Waverley, Ford, Detroit, American.) Garage, repairing.

Garages.

Rathbun House Garage.—Exchange St.

Watrous Automobile Co.—Main St. (The Heights.)

Willys-Crew Motor Car Co.—119 Main St. (Rambler, White, Premier, Pope-Waverley, Ford, Detroit, American.) Repairs, supplies.

Parts and Accessories Manufacturers.

Eclipse Machine Co. Coaster brakes, screws, nuts.

Rees, F. H. Steel Memorial Bldg. License numbers, monograms, name plates.

FAR ROCKAWAY—

Garages.

Casey, Edward.—387 Central Ave.

FAYETTEVILLE—

Parts and Accessories Manufacturers.

Lester Co., E. F. Aluminum, solder.

FLUSHING—

Garages.

Flushing Auto Garage.—107 Broadway. Repairing.

Repairing, Automobile.

Flushing Auto Garage.—107 Broadway. Garage.

FONDA—

Garages.

Jansen & Huestis.

Mohawk Machine Shop.—Main St.

FORT EDWARD—

Automobile Agents and Dealers.

McCoy, Fred V.—23 East St. (Maxwell.)

NEW YORK (Continued)

FORT PLAIN—

Garages.

Hale, Ralph.—Willet and Crouse Sts.

FREDONIA—

Automobile Agents and Dealers.

Hammend, J. W.—79-81 W. Main St. (Waltham.)

FREEPORT, LONG ISLAND—

Automobile Agents and Dealers.

Smith, G. Bennet. (Logan.)

Garages.

Baldwin Motor Works.—Merrick Road. Supplies.

Supplies, Automobile.

Baldwin Motor Works.—Merrick Road. Garage.

FULTON—

Automobile Agents and Dealers.

Emeny Co., G. J.—Hubbard St.

Miller & Armstrong.—N. 1st St.

Parts and Accessories Manufacturers.

Parker Co., J. J.—506 Erie St. Marine motors.

GARDEN CITY, LONG ISLAND—

Automobile Agents and Dealers.

Garden City Garage, The. (American Mercedes.)

Porrier, A.—Franklin St. (Maxwell.) Garage, repairing.

Garages.

Porrier, A.—Franklin St. (Maxwell.) Repairing.

Repairing, Automobile.

Porrier, A.—Franklin St. (Maxwell.) Garage.

GENEVA—

Clubs and Associations.

Geneva Automobile Club.—C. W. Fairfax, Sec.

Automobile Agents and Dealers.

Clapp, J. Reginald.—379 S. Main St. (Covert.)

Geneva Automobile Co.—145 Castle St. (Cadillac.) Garage, repairing, supplies.

McCan, Dr. W.—391 S. Main St. (Franklin.)

Garages.

Geneva Automobile Co.—145 Castle St. (Cadillac.) Repairing, supplies.

Motorboat Manufacturers.

Fay & Bowen.—92 Lake St.

Parts and Accessories Manufacturers.

Fay & Bowen Engine Co.—92 Lake St. Marine and kerosene motors.

Motor and Mfg. Wks. Mufflers, cut-out mufflers.

Repairing, Automobile.

Geneva Automobile Co.—145 Castle St. (Cadillac.) Garage, supplies.

Supplies, Automobile.

Geneva Automobile Co.—145 Castle St. (Cadillac.) Garage, repairing.

NEW YORK (Continued)

GLEN COVE—

Garages.

Long Island Garage Co.

Titus, L. H.—Glen St. Repairing.

Repairing, Automobile.

Titus, L. H.—Glen St. Garage.

GLEN FALLS—

Automobile Agents and Dealers.

Cowls, D. H. (Ford.)

Miller Bros.—Office, 7 Bay St.; Garage, 12 Maple St. (Buick.) Garage, repairs, supplies.

Seaman, Jr., Samuel J.—Glen St. (Ford.)

Garages.

Miller Bros.—Office, 7 Bay St.; Garage, 12 Maple St. (Buick.) Repairing, supplies.

Repairing, Automobile.

Miller Bros.—Office, 7 Bay St.; Garage, 12 Maple St. (Buick.) Garage, supplies.

Supplies, Automobile.

Miller Bros.—Office, 7 Bay St.; Garage, 12 Maple St. (Buick.) Garage, repairing.

GLOVERSVILLE—

Automobile Agents and Dealers.

Brown, A. B. (Waltham.)

Curtin-Hebert Mfg. Co.—75 S. Main St. (Northern.)

Griffin, N. D.—99 W. Fulton St. (Pope.) Repairing, garage.

Wilkins, E. J. (Atlas.)

Garages.

Bremer, L. A.—25 Washington St.

Griffin, N. D.—99 N. Fulton St. (Pope.) Garage.

Parts and Accessories Manufacturers.

Allen & Son, John C. Gloves and Gauntlets.

Repairing, Automobile.

Griffin, N. D.—99 N. Fulton St. (Pope.) Garage.

Steele Mfg. Co.

GOOD GROUND, LONG ISLAND—

Garages.

Clowes, Chas.

GOVERNEUR—

Automobile Agents and Dealers.

Freeman, F. N. (Maxwell.)

GRANVILLE—

Automobile Agents and Dealers.

Mettowee Valley Auto Agency. (Cadillac.)

GREAT NECK, LONG ISLAND—

Garages.

Scherick Bros.

GREATKILLS, STATEN ISLAND—

Motorboat Manufacturers.

Solheim's Launch Works.

GREENPOINT—

Automobile Agents and Dealers.

Hedges, S. P.—13 Main St. (Ford.)

NEW YORK (Continued)

GREENPORT—

Motorboat Manufacturers.

Fraser Hollow Spar & Boat Co.

GROVETON—

Automobile Agents and Dealers.

Tibbetts, N. H. (Lambert.)

HAMMONDSPORT—

Automobile Agents and Dealers.

Curtiss Mfg. Co., G. H. (Frayer-Miller, Ford.)

Motorcycle Manufacturers.

Curtiss Mfg. Co., G. H.

Motorcycle Equipment & Supply Co.

—4 Lake St.

HAVERSTRAW—

Automobile Agents and Dealers.

Driscoll, Martin A. (Smith.)

Gillies, J. W. (Franklin.)

Weiant & Rembe. (Ford.)

Garages.

Haverstraw Garage, The.

HEMPSTEAD, LONG ISLAND—

Automobile Agents and Dealers.

Central Garage.—Fulton St. (Jackson, Austin.)

Hutcheson & Smith. (Ford, Auto-car.)

Tew, B. T. (Haynes.)

Garages.

Christ, E. J.—7 Franklin St.

Motorcycle Manufacturers.

Meadowbrook Cycle Co.—137-141 Jackson St.

HERKIMER—

Clubs and Associations.

Herkimer Automobile Club.

Automobile Agents and Dealers.

Clark, J. A.—Eastern Ave. (Maxwell.)

Herkimer Motor Car Co.—124-126 Albany St. (Maxwell.) Garage, repairs.

Garages.

Herkimer Motor Car Co.—124-126 Albany St. (Maxwell.) Repairing, supplies.

Keefe, J. C.—133 Main St.

Repairing, Automobile.

Herkimer Motor Car Co.—124-126 Albany St. (Maxwell.) Supplies, garage.

Supplies, Automobile.

Herkimer Motor Car Co.—124-126 Albany St. (Maxwell.) Garage, repairing.

HIGHBRIDGE—

Parts and Accessories Manufacturers.

Taylor, Iron & Steel Co. Steel castings.

HOT SPRINGS—

Garages.

Knickerbocker Garage.

NEW YORK (Continued)

HORNELL—

Automobile Agents and Dealers.

Peters & Kittell.—Cass and Union Sts. (Rambler.)

HUDSON—

Automobile Agents and Dealers.

Crown Garage.—534 Washington St. (Franklin.)

Lisk & Petry.—405-407 Diamond St. (Stevens-Duryea, Cadillac, Thomas.) Garage, repairs, supplies.

Garages.

Gifford-Wood Co.—Greene and Columbia Sts.

Lisk & Petry.—405-407 Diamond St. (Stevens-Duryea, Cadillac, Thomas.) Repairs, supplies.

Repairing, Automobile.

Lisk & Petry.—405-407 Diamond St. (Stevens-Duryea, Cadillac, Thomas.) Supplies, garage.

Supplies, Automobile.

Lisk & Petry.—405-407 Diamond St. (Stevens-Duryea, Cadillac, Thomas.) Garage, repairs.

HUNTINGTON, LONG ISLAND—

Automobile Agents and Dealers.

Arthur & Flessel. (Waltham.)

Gerard & Hall. (Aerocar.)

Repairing, Automobile.

Chateau des Beaux Arts. Garage, supplies.

Supplies, Automobile.

Chateau des Beaux Arts. Repairing, garage.

Garages.

Chateau des Beaux Arts. Supplies, repairing.

Motorboat Manufacturers.

Halesite, Huntington Harbor.

Parts and Accessories Manufacturers.

Huntington Automobile Co. Tire plugs.

ILION—

Automobile Agents and Dealers.

Stone, Geo. H. P.—Harter Block. (Pope-Hartford.)

Garages.

Fake, Ed. D.—18 E. Clark St.

INTERLAKEN—

Manning, A. C. (Holsman.)

ITHACA—

Automobile Agents and Dealers.

McClure, F. A.—205 S. Cayuga St. (Cadillac, Franklin.)

Garages.

Fairbanks-Grant Mfg. Co.—100 Albany St.

Motorboat Manufacturers.

Fairbanks-Grant Mfg. Co.

Parts and Accessories Manufacturers.

Fairbanks-Grant Mfg. Co. Auto and marine products.

NEW YORK (Continued)

Ithaca Carriage Co. Automobile seats. Wyckoff Lumber & Mfg. Co. Portable houses.

Publications.

Sibley Journal of Engineering.

JAMAICA—

Automobile Agents and Dealers.

Disbrow Bros. Garage.—Hillside Ave. and Hoffman Blvd. (Rainier, Ford, White, Stearns.) Garage, repairs, supplies.

Garages.

Disbrow Bros. Garage.—Hillside Ave. and Hoffman Blvd. (Rainier, Ford, White, Stearns.) Repairs, supplies.

Morris Auto-Garage.—Fulton St., cor. Merrick Road. Repairs, supplies.

Repairing, Automobile.

Disbrow Bros. Garage.—Hillside Ave. and Hoffman Blvd. (Rainier, Ford, White, Stearns.) Supplies, garage.

Morris Auto-Garage.—Fulton St., cor. Merrick Road. Supplies, garage.

Supplies, Automobile.

Disbrow Bros. Garage.—Hillside Ave. and Hoffman Blvd. (Rainier, Ford, White, Stearns.) Garage, repairing.

Morris Auto-Garage.—Fulton St., cor. Merrick Road. Repairs, garage.

JAMESTOWN—

Garages.

Jamestown Iron Works Co.—11 Shranan Pl. Repairing.

Salisbury & Son.—14 Tilden Ave.

Warren, W. F.—214 Washington St.

Parts and Accessories Manufacturers.

Art Metal Construction Co. Lockers.

Davidson & Co., J. S. Wrenches.

Hjorth Wrench Co. Tools, wrenches.

Salisbury Wheel & Mfg. Co. Wheels, front and rear axles.

Repairing, Automobile.

Jamestown Iron Works Co.—11 Shranan Pl. Garage.

JAMESVILLE—

Parts and Accessories Manufacturers.

Jamesville Mfg. Co. Hubs, nipples, steel rims, steering apparatus, steering wheels, wire wheels, wood wheels.

JOHNSTOWN—

Automobile Agents and Dealers.

Ferres, John G.—118 W. Main St. (Reo.) Supplies.

Garages.

Allfrey, Henry, Jr.—24 N. Melcher St.

Travis & Occho.—215 N. Perry St.

Parts and Accessories Manufacturers.

Heagle, James.—Cor. 1st and Market Sts. Gloves, gauntlets.

Supplies, Automobile.

Ferres, John G.—118 W. Main St. (Reo.)

NEW YORK (Continued)

KATONAH—

Automobile Agents and Dealers.

Barrett, W. G. (Maxwell.)

Katonah Garage.—Railroad Ave. and Allen Court. (Premier, Maxwell.)

KELLY'S CORNERS—

Automobile Agents and Dealers.

Hubbell Bros. (Maxwell.)

KINGSTON—

Automobile Agents and Dealers.

Hughes, S. A. (Elmore.)

Kingston Garage.—Grand and Prince Sts. (Rambler, Ford.)

Van Amberg, C. E.—118 N. Perry St. (Maxwell.)

Automobile Manufacturers, Gasolene.
New York Car & Truck Co. Auto department.

Garages.

Forsyth & Davis.—777 Broadway. Repairing.

Parts and Accessories Manufacturers.
Kingston Truck & Bolt Co. Drop forgings.

Repairing, Automobile.

Forsyth & Davis.—777 Broadway. Garage.

LAKE PLACID—

Automobile Agents and Dealers.

Adirondack Auto Co. (Cadillac, Thomas.) Garage, repairing.

Garages.

Adirondack Auto Co. (Cadillac, Thomas.) Repairing.

Motorcycle Agents and Dealers.

Adirondack Auto Co. (Indian.)

Repairing, Automobile.

Adirondack Auto Co. (Cadillac, Thomas.) Garage.

LAKEPORT—

Parts and Accessories Manufacturers.

Lakeport Mfg. Co. Steam engines.

LAWRENCE—

Garages.

Cedarhurst Auto Co., The.—Central Ave.

LEROY—

Automobile Agents and Dealers.

Leroy Strg. & Trans. Co. (Holsman.)

Sperry, W. M. (Maxwell.)

Garages.

Sperry, Wilbur.—Myrtle St.

LITTLE FALLS—

Automobile Agents and Dealers.

Feldmeir, Harvey. (Franklin.)

Garages.

Ross Motor Car Co., C. A.—40 W. Main St. Repairs, supplies.

Supplies, Automobile.

Ross Motor Car Co., C. A.—40 W. Main St. Garage, repairs.

Repairing, Automobile.

Ross Motor Car Co., C. A.—40 W. Main St. Supplies, garage.

NEW YORK (Continued)

LOCKPORT—

Automobile Agents and Dealers.

Atkinson Auto & Garage Co.—Ashley Bldg. (Maxwell.)

Dussault Auto Works, The.—Buffalo St. (Cadillac, Winton.)

Automobile Manufacturers, Gasolene.

Covert Motor Vehicle Co.—57 Richmond Ave.

Automobile Manufacturers, Gasolene Commercial.

American Motor Truck Co.

Covert Motor Vehicle Co.

Parts and Accessories Manufacturers.

Covert Motor Vehicle Co.—47-61 Richmond Ave. Axles and transmissions.

Electric Smelting & Aluminum Co.—W. Jackson St. Aluminum, brass and copper metals.

Ferree, E. H.—Market St. Aluminum.

LONG BEACH—

Clubs and Associations.

Long Beach Country Club.—Raymond F. Ayers, Sec.; Temple Court Bldg., New York City.

LONG ISLAND CITY—

Automobile Manufacturers, Electric.

General Vehicle Co.—Borden and Review Aves.

Automobile Manufacturers, Gasolene.

Daimler Mfg. Co.—959 Steinway Ave.

Automobile Manufacturers, Gasolene Commercial.

Daimler Mfg. Co.—959 Steinway Ave.

Automobile Manufacturers, Steam.

Newcomb Motor Co.—378 Jackson Ave.

Automobile Manufacturers, Steam Commercial.

Newcomb Motor Co.—378 Jackson Ave.

Garages.

Gem Cycle Exchange.—73 Borden Ave.

Long Island City Auto Garage Co.—East Ave., cor. 8th St.

Miller's Sons, W. P.—75 3d St.

Motorboat Manufacturers.

Williams-Whittlesey Co.

Parts and Accessories Manufacturers.

Chase, Roberts & Co.—West Ave. and 5th St. Varnishes, wood fillers, japans and dryers.

McCaill Brainard Engine Co.—390 Webster Ave. Gasoline marine motors.

Miller's Sons, Wm. P.—73-79 3d St. Grease, oils and semi-solid oils.

LOWVILLE—

Automobile Agents and Dealers.

Pelton, Chas. E.—7 Shady Ave. (Knox.)

NEW YORK (Continued)

LYNBROOK, LONG ISLAND—

Automobile Agents and Dealers.

Whitcomb Auto Co.—Merrick Rd. and Broadway. (Maxwell.)

Parts and Accessories Manufacturers.

Longhurst, James S.—Walnut St.
Fire cement and mending cement for metals.

Longhurst, Jas. S., Jr. Tire fluid.

MALONE—

Automobile Agents and Dealers.

Brown, Birt. (Maxwell.)

Mason, Ernest. (Reo.)

MASSENA—

Automobile Agents and Dealers.

Brouse, W. B. (Rapid.)

MEDINA—

Automobile Agents and Dealers.

Medina Stamping & Mach. Co.—
Church St. (Winton, Cadillac, Oldsmobile, Autocar, Pope-Toledo.)

Garages.

Barrett, E. H.—Main St.

MIDDLEBURGH—

Automobile Agents and Dealers.

Pindar, N. J. (Mitchell.)

MIDDLETOWN—

Automobile Agents and Dealers.

Empire Garage.—97 North St. (Cadillac.)

Fancher, Sayer.—21 Cottage St. (Lambert.)

Middletown Auto Co.—10 Henry St. (Maxwell.)

Morrow & Bretthauer.—Cor. John and North Sts. (Rambler, Ford, Frontenac.)

Swezy, C. L. (Dragon.)

Garages.

Coleman, Galen.—11 Academy Ave.

Parts and Accessories Manufacturers.

Nevermiss Fire Extinguisher Co. Fire extinguishers.

Renting.

Wilcox, Lewis E.—Main St., cor. Grand Ave.

MILLBROOK—

Automobile Agents and Dealers.

Swift, Chas. I. (Mitchell.)

MINEOLA, LONG ISLAND—

Automobile Agents and Dealers.

Schmidt, Edw. (National, Rambler.)

Wimonsen, Wm. (Mitchell.)

Garages.

Mineola Motor Car Co.

MORIAH—

Automobile Agents and Dealers.

Putnam, C. M. (Waltham.)

MORRIS HEIGHTS, N. Y. C.—

Motorboat Manufacturers.

Gas Engine & Power Co., and Chas. L. Seabury Co.

N. Y. Yacht, Launch & Engine Co.

NEW YORK (Continued)

Parts and Accessories Manufacturers.

Gas Engine & Power Co., and Chas. L. Seabury Co.

MORRISTOWN—

Motorboat Manufacturers.

Thousand Island Boat & Engine Co.

MT. KISCOE—

Automobile Agents and Dealers.

Gorham, R. W. (Northern.)

MT. VERNON—

Automobile Agents and Dealers.

Henning, Jos. A.—205 Stevens Ave. (Winton.)

Huss, H., Jr. (Maxwell.)

Smith & Co., Carey W. C.—98 W. Lincoln Ave. (Rapid.)

Stephenson, C. A. (Aerocar.)

Van Schaick, C. D. (Covert.)

Garages.

Contractors Electric Co.—9 Prospect St.

Mt. Vernon Automobile Co.—Prospect St. and N. 3d Ave.

Mt. Vernon Auto Station.—Prospect St. and N. 4th Ave.

Parts and Accessories Manufacturers.

Benford, E. M.—497 Lincoln Ave.

Mica, spark plugs.

Draper Co., Walter H.—120 S. Railroad Ave. Lubricants, grease and oil.

NEWARK—

Automobile Agents and Dealers.

Drake & Sons, Harry R.—122 E. Union St. (Reo.) Garage, repairing.

Hollywood Motor Co., The. (Marion.)

Automobile Manufacturers, Gasolene.

Mora Motor Car Co.

Garages.

Drake & Sons, Harry R.—122 E. Union St. (Reo.) Repairing.

Mora Motor Car Co.

Repairing, Automobile.

Drake & Sons, Harry R.—122 E. Union St. (Reo.) Garage.

NEW BRIGHTON, S. I.—

Clubs and Associations.

Richmond County Automobile Club.—J. J. Worrell, Sec.

NEWBURGH—

Clubs and Associations.

Automobile Club of Newburgh.—Geo. S. Weller, Sec.

Automobile Agents and Dealers.

Mason Automobile Exchange.—163 Broadway. (Franklin.)

Newburgh Auto Shop, Youngs & Co., Inc.—249 Grand St. (Autocar, Winton.) Garage, repairs.

Automobile Manufacturers, Gasolene.

Abendroth & Root Mfg. Co.

Garages.

Bellingher's Garage.—10-12 Landers St., nr. Broadway. Repairs, supplies.

NEW YORK (Continued)

Newburgh Auto Shop, Youngs & Co., Inc.—249 Grand St. (Autocar, Winton.) Repairs.

Parts and Accessories Manufacturers.
Fabrokoid Co. Artificial leather.

Lackawanna Mfg. Co. Gasoline marine motors.

Staples & Hanford. Springs.

Webb Mfg. Co.—60 Shipman St. Speedometers, flexible shafts, wire belts.

Repairing, Automobile.

Bellinger's Garage.—10-12 Landers St., nr. Broadway. Supplies, garage.

Newburgh Auto Shop, Youngs & Co., Inc.—249 Grand St. (Autocar, Winton.) Garage.

Supplies, Automobile.

Bellinger's Garage.—10-12 Landers St., nr. Broadway. Garage, repairing.

NEW HYDE PARK—

Automobile Agents and Dealers.

Kiefer's Sons, Henry. (Reo.)

NEW PALTZ—

Automobile Agents and Dealers.

Johnson & Son, Geo. E.—Chestnut St. (Jackson, Ford.)

NEW ROCHELLE—

Automobile Agents and Dealers.

Wallace Bros. Co.—46-48 Main St. (Maxwell.) Garage, repairs and supplies.

Winslow, A. S. (Cadillac.)

Garages.

Deselbrow Motor Car Co.

Rochelle Motor Co.—Main St.

Wallace Bros. Garage.—245 Huguenot St.

Wallace Bros. Co.—46-48 Main St. (Maxwell.) Repairs, supplies.

Westchester Motor Car Co.—124-126 Main St., nr. Franklin Ave. Repairing, supplies.

Motorcycle Manufacturers.

Huntington Mfg. Co.

Parts and Accessories Manufacturers.

United States Battery Co. Storage batteries.

Repairing, Automobile.

Wallace Bros. Co.—46-48 Main St. (Maxwell.) Garage, supplies.

Westchester Motor Car Co.—124-126 Main St., nr. Franklin Ave. Supplies, garage.

Supplies, Automobile.

Wallace Bros. Co.—46-48 Main St. (Maxwell.) Garage, repairing.

Westchester Motor Car Co.—124-126 Main St., nr. Franklin Ave. Garage, repairs.

NEW YORK CITY—

Clubs and Associations.

Aero Club of America.—Augustus Post, Secretary, 12 E. 42d St.

NEW YORK—New York City (Cont.)

American Automobile Association.—Frederick H. Elliott, Secretary, 437 5th Ave.

American Motor Car Manufacturers Association.—Alfred P. Reeves, General Manager, 29 W. 42d St.

American Motor League.—Headquarters, Vanderbilt Bldg., 132 Nassau St.

Association Licensed Automobile Manufacturers.—Milton J. Budlong, General Manager, 7 E. 42d St.

Association Patents Co.—7 E. 42d St. Patents holding company of the A. L. A. M.

Automobile Club of America.—S. M. Butler, Secretary, 54th St., nr. Broadway.

Bronx Automobile Club.—J. Stuart Blackton, Sec., 310 Mott Ave.

Chauffeurs' Protective Association of America.—1947 Broadway.

Federation of American Motorcyclists.—R. G. Betts, Pres., Tribune Bldg., 150 Nassau St.

Importers' Automobile Salon.—Bryant Park Bldg.

Long Island Motor Parkway.—537 5th Ave.

Motor Boat Club of America.—Hugh Gamble, Secretary, 314 Madison Ave.

National Ass'n of Automobile Manufacturers.—S. A. Miles, Gen. Mgr., 7 E. 42d St.

National Professional Chauffeur Club. No. 1, of the United States.—1947 Broadway.

New York Automobile Club.—306 W. 109th St. I. E. Roskam, Sec., 110 W. 34th St.

New York Automobile Trade Ass'n.—Broadway and 62d St.

New York Timers' Club.—P. O. Box 1453.

Professional Chauffeurs' Club of America.—1775 Broadway.

Automobile Agents and Dealers.

Allen-Kingston Motor Car Co.—3 W. 44th St. (Allen-Kingston.)

American Locomotive Motor Car Co.—Broadway and 62d St. (License Berliet.)

American Motor Car & Sales Co.—2230 Broadway at 80th St. (American, Marion, Overland.)

Archer & Co.—1597 Broadway. (Hotchkiss.)

Argus Import Co.—17 E. 34th St. (Argus.)

Atlantic Motor Car Co.—57th St. and Broadway. (Stoddard-Dayton.)

Atlas Motor Co., The.—102 W. 107th St. (Acme.)

NEW YORK—New York City (Cont.)

- Auto Arcade Co.—164 W. 46th St. (Second-hand cars.)
 Autocar Sales Co., The—Broadway and 80th St. (Autocar.)
 Auto Import Co.—1786 Broadway. (Rochet-Schneider.)
 Automobile Exchange & Storage Co.—133-135-137-139 W. 38th St. (Second-hand cars.) Garage, repairing.
 Automobile Sales Corp. of N. Y.—1665 Broadway. (American Mercedes.)
 Automobile Maintenance Co.—1239 Fulton St. (Second-hand dealers.)
 Babcock Electric Carriage Co.—1591 Broadway. (Babcock.)
 Baker Motor Vehicle Co.—1790 Broadway. (Baker.)
 Barnett-Jackson Co.—236 W. 54th St. (Dorris.)
 Bowman Automobile Co., Sidney B.—225-231 W. 49th St. (Clement-Bayard, Apperson.) Garage, repairing.
 Brewster & Co.—47th St. and Broadway. (Renault, Acme.)
 Cantono Garage.—111 W. 37th St. (Cantono.)
 Cartercar Co.—7 W. 60th St. (Cartercar.)
 Chelsea Auto Storage Co.—516 W. 37th St. (The Manhattan gasoline commercial trucks and passenger cars.) Garage, repairing.
 Cleveland Motor Car Co.—Office, 1659 Broadway. (Cleveland.)
 Clover Mfg. Co.—228 W. 58th St. (Second-hand cars.)
 Colonial Garage.—220 W. 30th St. (Second-hand cars.) Repairing, garage.
 Commercial Motor Car Co., The.—Times Bldg., 42d St. and Broadway. (Safer Truck.)
 Corbin Motor Vehicle Corp.—1892 Broadway. (Corbin.)
 Crawford Agency.—152 W. 56th St. (Crawford.)
 Cryder & Co.—N. E. Cor. Park Ave. and 63d St. (Mors, Renault, Leon Bollée.) Garage, repairing.
 Darling, K. C.—1686 Broadway. (Second-hand cars.) Renting, supplies.
 Darracq Motor Car Co.—1989 Broadway. (Darracq.)
 DeBarre's Automobile Co.—1966-1968 Broadway. (Delahaye, Pilain.)
 De Dietrich Import Co.—3 W. 44th St. (Lorraine De Dietrich.)
 Dolson Automobile Co.—25 W. 42d St. (Dolson.)
 Duerr & Co., C. A.—77th St. and Broadway. (Royal.) Garage, repairing.

NEW YORK—New York City (Cont.)

- Electric Vehicle Co.—134 W. 39th St. (Columbia.)
 Elmore Auto Co.—1851 Broadway. (Elmore.)
 Empire State Motor Car Co.—2148-50 Broadway. (Craig-Toledo, Queen.) Garage, repairing.
 Fiat Automobile Co.—1789-1791 Broadway. (American branch Fiat Fabbrica Italiana Automobile Torino, Manufacturers of Fiat Automobiles.)
 Fiss, Doerr & Carroll Horse Co.—153 E. 24th St. (Reliance, American.)
 Ford Motor Co.—1721 Broadway. (Ford.)
 Franklin Automobile Company.—Broadway, Amsterdam Ave. and 73d St. (Franklin.)
 Frayer-Miller Motor Car Co.—62d St. and Broadway. (Frayer-Miller.) Garage.
 Garford Motor Car Co.—1540-1542 Broadway. (Garford.) Repairing.
 General Vehicle Co.—Broadway and 62d St. (G. V. cars and trucks.)
 Globe Automobile Exporters, The.—43 Cedar St. (De Dion Bouton, Spyker.)
 Grossman, Geo. J.—1649 Broadway. (Cadillac.)
 Harrolds Motor Car Co.—233-237 W. 54th St. (Pierce Arrow.)
 Hartford Suspension Co.—67 Vestry and 212 W. 88th St. (Gobron Brillie.) Garage, repairing.
 Haynes Automobile Co.—1715 Broadway. (Haynes.) Repairing.
 Hernandez, J. C.—90 Wall St. (Locomobile, export only.)
 Hol-Tan Co., The.—244 W. 49th St. (Hol-Tan, Fiat.)
 Homan & Schultz.—38 W. 62d St. (Rambler, National.)
 Hought, Harry S.—63d St. and Broadway. (Thomas.) Garage.
 Hudson Automobile Co.—516 W. 145th St. (Lane, Springfield.)
 International Automobile Exchange, The.—250 W. 49th St. (Second-hand cars.)
 Irvin Richard & Co.—25 Broad St. (Maxwell.)
 Isotta Import Co.—1624 Broadway. (Isotta Fraschini.)
 Itala Import Co.—335 5th Ave. (Itala.)
 Johnson Service Co.—20th St. and Broadway. (Johnson.)
 Joyce, Ralph.—1531 Broadway. (Second-hand cars.)
 Kehoe Co., Inc., E. J., The.—1659 Broadway. (Continental.)
 Kingsbridge Garage.—W. 230th St., nr. Broadway. (Second-hand cars.)

NEW YORK—New York City (Cont.)
 Knox Automobile Co.—1595 Broadway. (Knox.)
 Kull Auto Co., A. L.—1677 Broadway. (Dragon.)
 La Buire Import Co.—1964 Broadway. (De La Buire.)
 La France Motor Co.—753 5th Ave. (Cottin & Desgouttes.) Repairing.
 Lane Sales Co.—514 W. 145th St. Gen. Sales Agts. Lane Motor Vehicle Co., Poughkeepsie, N. Y.
 Lear Automobile Co., Oscar.—Motor Mart, Broadway and 62d St. (Frayser-Miller.)
 Locomobile Co. of America.—Broadway and 76th St. (Locomobile.)
 Lozier Motor Co., The.—55th St. and Broadway. (Lozier.)
 McLean Automobile Co.—1604 Broadway. (Lambert.)
 MacNamara, Lewis P.—1591 Broadway. (Renault.)
 Maja Co., Ltd., American Branch.—230 W. 58th St. (Maja.)
 Martin, C. H.—31 W. 42d St. (Atlas runabout.)
 Martini Import Co.—239 W. 50th St. (Martini.)
 Mason Automobile Exchange.—163 Broadway. (Franklin.)
 Maxwell-Briscoe, Inc.—317-319 W. 59th St. (Maxwell.)
 Mercedes Import Co.—590 5th Ave. (Mercedes.)
 Mitchell Motor Co. of N. Y.—1876 Broadway. (Mitchell.)
 Mora Motor Co. of New York.—Broadway and 52d St. (Mora.)
 Motobloc Agency, The.—244 W. 69th St. (Motobloc.)
 Motor Sales Co.—1771 Broadway. (De Luxe.)
 Murray Hill Garage.—32 E. 40th St. (Second-hand cars.)
 New Amsterdam Motor Co.—152 W. 56th St. (Crawford.) Repairing.
 New York Motor Car Co.—231 W. 40th St. (Atlas trucks.)
 New York Transportation Co.—49th St. and 8th Ave. (Columbia.) Exide batteries. Garages: 66th St. and 3d Ave., 27th St. and 9th Ave., Bayard St. and Bowery.
 Oldsmobile Co.—1653 Broadway. Oldsmobile.)
 Owen Co., R. M.—1759 Broadway. (Premier, Reo.)
 Owen, Inc., Percy.—62d St. and Broadway. (Bianchi.)
 Packard Motor Car Co.—1861 Broadway. (Packard.) Garage.
 Palais de L'Automobile.—Broadway and 57th St. (Delauney Belleville, Panhard, Renault.)

NEW YORK—New York City (Cont.)
 Palmer & Singer Mfg. Co.—1620-1624 Broadway. (Simplex, P. & S.) Garage, repairing.
 Panhard & Levassor.—Broadway and 62d St. (Panhard.)
 Peerless Motor Car Co.—220 W. 41st St. (Peerless.)
 Plaza Auto Co.—Union St. (Second-hand cars.)
 Rainier Motor Car Co., The.—Broadway and 56th St. (Rainier.)
 Ranny & Co., A. Elliot.—1851 Broadway. (Elmore.) Garage, repairing.
 Renault Freres Selling Branch.—Broadway and 57th St. (Renault.)
 Rolls-Royce Import Co.—1879 Broadway. (Rolls-Royce.)
 Scott Motor Co., Geo. J., The.—1720-1722 Broadway. (Jackson, Glide.) Garage, repairing.
 Smith Auto Co.—61st St. and Broadway. (Smith.)
 Southworth Co., A. G.—1733 Broadway. (Pope-Toledo, Pope-Hartford, Pope-Waverley.) Repairing.
 Spalding & Bros., A. G.—29 W. 42d St. (Stevens-Duryea.) Garage, repairing.
 St. Louis Car Co.—1776 Broadway. (American Mors.)
 State Motor Service Co.—216 W. 50th St. (Second-hand cars.)
 Studebaker Bros. Co.—Broadway and 48th St. (Studebaker.)
 Times Square Automobile Co.—1599-1601 Broadway. (Second-hand cars.)
 Tyrrell, Geo. H.—2639 Webster Ave. (Second-hand cars.)
 Van Alstyne, T. B.—25 W. 42d St. (Dolson.)
 Walter Auto Co.—49 W. 66th St. (Walter.)
 Waltham Mfg. Co.—1615 Broadway. (Waltham.) Repairing.
 Welch Motor Car Co.—1871-1873 Broadway. (Welch.) Repairing, Welch cars only.
 Wellington Garage.—826 7th Ave. (Second-hand cars.)
 White Co., The.—Broadway and 62d St. (White.)
 Winton Motor Carriage Co.—Broadway and 70th St. (Winton.)
 Woods Motor Vehicle Co. (Woods.)
 Wyckoff, Church & Partridge.—Broadway and 56th St. (Stearns.) Garage, repairing, supplies.
Auto Bail Bonds.
 National Surety Co.—346 Broadway.
Automobile Manufacturers, Electric Commercial.
 General Vehicle Co.—Broadway and 62d St.
 McNaughton Co., James.—29 W. 42d St.

NEW YORK—New York City (Cont.)

Automobile Manufacturers, Gasolene
Cleveland Motor Car Co.—1659 Broad-
way.

Hewitt Motor Co.—10 E. 31st St.

Lozier Motor Co., The.—55th St. and
Broadway.

Simplex Automobile Co.—83d St. and
East River.

**Automobile Manufacturers, Gasolene
Commercial.**

Consolidated Motor Co.—148 W. 56th
St.

Empire State Engineering Works.—
555 E. 116th St.

Hewitt Motor Co.—10 E. 31st St.

McNaughton Co., James.—29 W. 42d
St.

Garages.

Acton Garage.—137 W. 89th St.

Alborak Auto Co.—Broadway and 62d
St.

Allenhurst Garage & Auto Station.—
135-137 W. 37th St. Repairs, rent-
ing.

Alpine Automobile Co.—238 W. 108th
St.

Ansonia Auto Co.—235 W. 69th St.

Arion Garage, Inc.—485 Park Ave.

Aster Garage.—123 W. 52d St.

Auto Arcade Repair Co.—164 W. 46th
St.

Auto Buyers' Association.—98 Cham-
bers St.

Auto Corporation & Agency.—138 W.
38th St.

Auto Garage.—146 W. 39th St.

Automobile Hire & Sales Co.—231 W.
40th St.

Auto Livery.—1604 Broadway, 142 W.
18th St.

Auto Mart.—37th St. and 7th Ave.

Automobile Arcade.—Broadway and
49th St.

Automobile Auction Co. of America.
—41-43 W. 63d St.

Automobile Depot, Inc.—215 W. 48th
St.

Automobile Exchange & Storage Co.
—133-5-7-9 W. 38th St. (Second-
hand cars.) Repairing.

Automobile Hire & Sales Co.—231 W.
40th St.

Auto Renting Co.—1626 Broadway.

Auto Renting & Selling Co.—111 W.
37th St.

Auto Renting & Touring Co.—304 W.
54th St.

Auto Tally-Ho Co.—1358 Broadway.

Auto Touring Co.—133 W. 38th St.

Auto Transportation Co.—309 W. 41st
St.

B. & H. Motor Car Co.—147-49-51 W.
49th St. Garage, repairing.

Bargain Auto Co.—1628 Broadway.

NEW YORK—New York City (Cont.)

Barwise, R. M.—170th St. and Jerome
Ave. (Chalfant.) Repairing.

Bell, Billmyer & Rothke.—211 W. 87th
St.

Blue Ribbon Garage Co.—112 East
75th St.

Bowman Automobile Co., Sidney B.
—225-231 W. 49th St. (Importer,
Clement-Bayard, Agent, Apperson.)
Repairing.

Brady, A. C.—32 W. 33d St.

Broadway Auto Exchange.—513 7th
Ave.

Broadway Auto Renting Co.—164 W.
46th St.

Bronx Auto Garage.—1115 Boston Rd.

Bryant & Johnson.—120 E. 84th St.

Bryant Garage.—50-56 W. 43d St.
Repairing.

Bryant Motor Co.—110 W. 41st St.
and 1675 Broadway. Garage.

Burghardt Milk Co., Louis.—211-213
W. 82d St.

Central Auto Station.—238 W. 50th
St.

Chelsea Auto Storage Co.—516 W.
37th St. (Manhattan.) Repairing.

Christie Motor Co., The.—51st St.
and 12th Ave.

Church, E. B.—140 W. 42d St.

Cimiotti Garage.—Broadway and 110th
St.

Colonial Garage.—220 W. 30th St.
(Second-hand cars.) Repairing.

Columbus Automobile Exchange.—
1780 Broadway.

Commission Automobile Co.—742 7th
Ave.

Continental Auto Co.—168 E. 75th St.
Crafts, H. L.—233 E. 33d St.

Cryder & Co.—N. E. Cor. Park Ave.
and 63d St. (Mors, Leon Bollée,
Renault.) Repairing.

Davy, Humphrey.—35 W. 43d St.

DeWitt Auto Co., The.—248-250 W.
80th St. Repairing, recharging bat-
teries.

Drewitz & Son, A.—White Plains Rd.
and 225th St.

Duerr & Co., C. A.—77th St. and
Broadway. (Royal.) Repairing.

Eastern Auto Co.—306 W. 52d St.

Edelman, Wm.—914 Pelham Ave.

Eilers & Kliesrath.—241 W. 107th St.

Electric Cab Co.—238 W. 50th St.

Electric Vehicle Co.—134 W. 39th St.

Empire State Motor Car Co.—2148-
2150 Broadway (Craig-Toledo,
Queen.) Repairing.

Eureka Auto Agency.—2285 8th Ave.

Excelsior Auto Co.—133 W. 32d St.

Fifth Ave. Garage.—45 W. 44th St.

Fire-Proof Garage.—170th St. and
Jerome Ave.

Fisher, Peter J.—57 W. 66th St.

NEW YORK—New York City (Cont.)

Foley, J. C.—Jerome Ave. and 162d St.
 Frayer-Miller Motor Car Co.—62d St. and Broadway. (Frayer-Miller.)
 Gerome, T. F.—130-132 W. 18th St. Repairing.
 Graham & Goodman, Inc.—51-55 W. 93d St.
 Harlem Automobile Co.—159 W. 127th St.
 Hartford Suspension Co.—67 Vestry St. and 212 W. 88th St. (Gobron-Brillie.) Repairing.
 Hartog, A.—303 W. 54th St.
 Hewitt Motor Co.—6 E. 31st St.
 Hoffman & Setzer Auto Station.—1918 Jerome Ave.
 Hout Co., Harry S.—63d St. and Broadway. (Thomas.)
 Imperial Auto Station.—52 W. 67th St.
 Imperial Garage, The.—52-54 W. 67th St.
 Irving Auto Station.—128 E. 19th St.
 Jensen Auto Co.—206 W. 65th St.
 Johnston & Son. Geo. E.
 Khesrath, V.—588 Fordham Road.
 Kid McCoy Motor Co.—60 W. 43d St.
 Knickerbocker Auto Co.—253 W. 64th St.
 Koehler Co., H. J.—Broadway and 51st St.
 Kratzer, Wayne.—1172 5th Ave.
 Kull Auto Co., A. L.—Garage, 62 W. 43d St.
 Lenox Auto Co.—60 W. 116th St.
 Lexington Garage.—135 E. 40th St.
 Light, Oliver.—280 St. Nicholas Ave.
 Lincoln Carriage Auto Co.—216 W. 50th St.
 Long Acre Auto Depot.—507 W. 44th St.
 Lurie's Automobile Depot.—287 Morris Ave.
 Mack Bros. Motor Car Co.—949 Broadway.
 Madison Square Garage.—226 E. 24th St.
 Manhattan Auto Storage & Garage.—541 W 52d St.
 Manhattan Storage Co.—334 W. 44th St.
 Manufacturer's Motor Car Co.—54 W. 43d St.
 Martyn's Auto Repair Station, D. J.—53 E. 124th St.
 McCartin, Geo. S.
 McIntosh Auto Garage.—130 W. 102d St.
 McKinley Square Auto Co.—1369 Boston Road.
 Meyer, Eugene.—347 Amsterdam Ave.
 Millward & Cook.—208 W. 124th St.
 Molter's Automobile Station.—26 W. 65th St.

NEW YORK—New York City (Cont.)

Motor Car Maintenance Co.—247-249 W. 49th St. Repairing.
 Motor Vehicle Repair & Storage Co.—121 W. 81st St.
 Mt. Morris Auto Garage.—27 W. 124th St.
 Murray Hill Auto Station.—27 E. 25th St.
 New York Auto College.—45 W. 44th St.
 New York Auto Garage.—306-308 W. 65th St.
 New York City Garage.—10 W. 60th St.
 New York Transfer Co.—344 W. 50th St.
 New York Transfer Co. Garage.—524 W. 36th St.
 New York Transportation Co.—49th St. and 8th Ave. (Columbia.) Exide batteries. Garages: 66th St. and 3d Ave., 27th St. and 9th Ave., Bayard St. and Bowery.
 Nichols, W. L.—244 W. 49th St.
 Odell, R. L.—156 W. 39th St.
 Outlook Motor Co.—102 W. 107th St.
 Packard Auto Renting Co.—1499 Broadway.
 Packard Garage.—162½ W. 46th St.
 Packard Motor Car Co.—1861 Broadway. (Packard.)
 Palace Garage Co.—214 W. 80th St.
 Palmer & Singer Mfg. Co.—1620-1624 Broadway. (Simplex, P. & S.) Repairing.
 Parkway Garage Co.—Central Park West and 110th St. Repairing.
 Paul & Heming.—Jerome Ave. and 162d St.
 Plaza Garage, The.—152 E. 55th St.
 Pyramid Garage Co.—36-38 W. 62d St.
 Quinn, James A.—300½ W. 54th St.
 Ranney & Co., A. Elliot.—1851 Broadway. (Elmore.) Repairing.
 Reynold & Archer.—169th St. and Jerome Ave.
 Rialto Automobile Exchange.—307 W. 44th St.
 Sanford, Frank A.—1843 Broadway.
 Sartori, Richard V.—353 W. 39th St.
 Schreiber, W.—132 W. 49th St.
 Scott Motor Co., Geo. J., The.—1720-1722 Broadway. (Glide.) Repairing.
 Seadate, G. H.—1923 Washington Ave.
 Setzer, Chas. Co.—561-63 Pelham Ave.
 Spalding & Bros., A. G.—29 W. 42d St. (Stevens-Duryea.) Repairing.
 Speedway Garage.—414 W. 155th St. Repairing.
 St. Nicholas Auto Depot.—53 W. 66th St.
 Strathmann's, Charles.—165 E. 120th St.

NEW YORK—New York City (Cont.)

Stubbe, F. H.—528 Morris Ave.
 Studebaker Garage.—138 W. 48th St.
 Times Square Automobile Co.—1599-1601 Broadway.
 Thourot, Paul.—240 W. 27th St.
 Tremont Garage & Repair Station.—1923 Washington Ave.
 Tuxedo Garage Co.—33 E. 58th St.
 Twombly Power Co. & Garage.—51st St. and 12th Ave.
 University Place Garage.—Washington Square.
 Victor Auto Storage Co.—147 W. 55th St. Repairing.
 Warren Auto Exchange.—38 W. 62d St.
 Washington Sq. Garage.—73 S. Washington Sq.
 West End Automobile Palace.—202 W. 89th St.
 West End Garage, The.—266 W. 135th St.
 Williamson, W. S.—123 Liberty St.
 Windsor Auto Co.—115 W. 37th St.
 Wyckoff, Church & Partridge.—Broadway, at 56th St. (C. G. V., Stearns.) Repairing, supplies.
 Yorkville Auto Station.—285 E. 88th St.
 Yorkville Central Garage, Inc.—205-209 E. 86th St.

Instruction, Automobile.

Baldwin, John F.—239 E. 53d St.
 Central Automobile School.—238-240 W. 50th St. Automobile instruction.
 Guarantee Automobile School Co.—162 W. 56th St.
 New York School of Automobile Engineers.—146 W. 56th St. Automobile instruction, correspondence.
 Y. M. C. A., West Side Branch.—318 W. 57th St.

Insurance, Automobile.

Columbia Insurance Co. of New Jersey.—37 Wall St.
 Fireman's Fund Insurance Co.—Atlantic Marine Dept., 37 Wall St.
 Travelers' Insurance Company.—32 Nassau St.; home office, Hartford, Conn.

Motorboat Manufacturers.

Church Motor & Launch Co.—62 William St.
 Consolidated Motor Co.—148 W. 56th St.
 Lozier Motor Co., The.—Broadway and 55th St.
 New York Kerosene Oil Engine Co.—31 Burling Slip.

Motorcycle Agents and Dealers.

Baker, F. A.—37 Warren St. (Indian.)
 Brandenburg & Co., (Selling Agents.)—103 Reade St. (Thor.)

NEW YORK—New York City (Cont.)

Gliesman, H. A.—782 Eighth Ave. (Curtiss.)
 McLaughlin, J. F.—148 E. 49th St.
 Ovington Mfg. Co. F. N. Motorcycle.
 Wanamaker, John.—Broadway & 10th St. (Merkel.)
 Widmayer, F. B.—2312 Broadway. (Indian.)

Motorcycle Manufacturers.

Ovington Mfg. Co.—2382 Broadway.
 Widmayer, F. B.—2312 Broadway.

***Parts and Accessories Manufacturers.**

Abbott, W. H.—1263 Broadway. Monograms, name plates.
 Abercrombie & Fitch.—57 Reade St. Collapsible buckets, auto covers.
 Acetyvone Co.—38 Park Row. Carbide, acetylene generators.
 Acetylene Gas Ill. Co.—105 Walker St. French carbide, acetylene burners, tanks and generators.
 Acme Spring Check Co.—1717 Broadway. Shock absorbers.
 Adams, Wm. F.—399 Broadway. Cloth and carpet trimmings.
 Ajax-Grieb Rubber Co.—Broadway and 57th St. Tires and rubber specialties.
 Alexander & Co., H. T.—17 State St. Oils.
 Allen Auto Specialty Co.—1931 Broadway. Tire holders, lamp covers, tire cases, tire locks, boots.
 Aller & Co., Harry A.—136 Liberty St. Metal polishes.
 Alpha Dry Battery Co.—28 Cortlandt St. Primary batteries.
 American Anti-Puncture Tire & Auto Co.—1693 Broadway. Tire sleeves.
 American Diesel Oil Engine Co.—11 Broadway. Kerosene motors.
 American Electrical Novelty & Mfg. Co.—308 Hudson St. Ammeters, voltmeters, primary batteries, automobile clocks, lamps, wire terminals.
 American Gas Furnace.—23 John St. Forge equipment.
 American Lamp Works.—253 W. 47th St. Lamps.
 American Sheet Steel Co.—24 State St. Sheet iron and steel.
 American Steel Wool Co.—451-453 Greenwich St. Steel wool.
 American Thermo-ware Co.—16 Warren St. Eye shields, hydrometers.
 Ampere Mfg. Co.—408-412 W. 13th St. Dry batteries.
 Ansonia Brass & Copper Co. Sheet and rod brass and copper, brass and copper metals, bronze metals, brass and copper tubing.
 Arc Spark Mfg. Co.—125 W. 32d St. Spark plugs.
 Arlington Co., The.—473-475 Broadway. Celluloid sheets.

NEW YORK—New York City (Cont.)

Arthur Co., The.—188 Front St. Metal gear wheels.
 Aster Co.—1610 Broadway. Carbureters.
 Atlantic Insulated Wire & Cable Co. Insulated wire.
 Auto Chemical & Mfg. Co.—1770 Broadway. Anti-freezing solutions.
 Auto Improvement Co.—316 Hudson St. Speedometers, tire tools, automatic starter, vulcanizer, carbureter.
 Auto Lock Plug Co., Inc.—31 Nassau St. Electric lock switches.
 Autolyte Mfg. Co.—10-12 Thomas St. Horns, lamps.
 Automobile-Road Map Co.—428 Lafayette St. Road maps.
 Auto Spring Repairer Co.—54 Maiden Lane. Spring repairers.
 Axiom Carburetter Mfg. Co., The.—106 E. 28th St. Carbureters.
 A.Z. Co., The.—527 W. 56th St. Radiators, hoods, mud guards, sprocket covers, tanks, bodies, dashes, fittings, brazing and beating, metal hampers and trunks, tool boxes, fans, mufflers, pipe, tube bending and brazing.
 Baeder, Adamson & Co.—67 Beekman St. Curled hair.
 Baird-Banks Mfg. & Supply Co.—35 Warren St. Carbureters and spark plugs.
 Balzer, Gus.—1556 Broadway. Radiators, monograms, crests, signs, lamps, auto numbering devices. Mfr's. Agt., grease guns, generators, oilers, shock absorbers, speedometers.
 Beckwith-Chandler Co.—220 5th Ave.—201 Emmett St., Newark, N. J. Varnishes.
 Bishop Gutta-Percha Co.—425 E. 25th St. Insulated wire.
 Boker & Co., Herman.—101 Duane St. Sparking points, steel.
 Bosch, Robert.—1945 Broadway. Magnetos and ignition dynamos, spark plugs, wire terminals.
 Bothner Hardwood Moulding Co.—1945 Park Ave. Wood panels.
 Boston Artificial Leather Co.—12 E. 18th St. Artificial leather.
 Bowers Metal Stamping Co.—718 E. 11th St. Curtain fasteners, machinery springs.
 Boyle & Co., John.—112-114 Duane St. License numbers, tool bags, auto trunks.
 Brann, E.—1225 Park Ave. Miscellaneous wearing apparel.
 Braunsdorf, Geo. W.—309 E. 43d St. Felt washers.
 Bretz Co., J. S. (Importer.)—Times Bldg. Ball bearings.

NEW YORK—New York City (Cont.)

Brewster & Co.—47th St. and Broadway. Bodies.
 Broc-Barber Auto Ignition Co.—143 W. 54th St. Magnetos and ignition dynamos, spark coils, spark plugs, timers, electric switches.
 Brooks Bros.—22d St. and Broadway. Miscellaneous wearing apparel.
 Buehne Wool Co., The.—93 Nassau St. Steel wool.
 Calman, Emil.—299 Pearl St. Varnishes.
 Cary Spring Works.—240 W. 29th St. Steel wire and springs.
 Central Leather & Rubber Tire Works.—238-240 W. 50th St. Leather tires.
 Childs Co., G. B., The.—499 Greenwich St. Oils and metal polishes.
 Clover Mfg. Co.—228 W. 58th St. Grinding compound.
 Cohen, Frank & Co., Inc.—Office 136 W. 23d St.; Factory, 765-771 Stone Ave., Brooklyn, N. Y. Boots.
 Cole & Woop.—50 W. 67th St. Tops, glass fronts, motor pans.
 Columbia Lubricants Co.—78 Broad St. Monograms, oils and greases.
 Columbia Smelting & Refining Works.—307 Water St. Brass and copper metals.
 Columbia Smelting & Refining Co.—365-367 West St. Pig lead, solder, tin, babbitt metal, white brass, metal alloys.
 Commercial Acetylene Co.—80 Broadway. Acetylene tanks.
 Commonwealth Rubber Co.—1001 Flatiron Bldg. Rubber cloth, pneumatic tires.
 Comptoir d'Innovations Pour Automobiles.—American branch, 1693 Broadway. Tire pumps, air compressors, exhaust whistles.
 Comstock Shock Absorber Co., The.—1661 Broadway. Self-adjusting hydraulic shock absorbers.
 Consolidated Rubber Tire Co.—39 Pine St. Main office, 243-245 W. 47th St. Tires.
 Continental Caoutchouc Co.—43 Warren St., 2100 Broadway. Pneumatic tires, tubes, raw stocks.
 Cooper Hewitt Electric Co.—220 W. 29th St. Lamps.
 Craig & Scott, 556 W. 34th St. Marine motors.
 Crane Co., W. N.—1131-33 Broadway. Gas lamp burners.
 Crane & MacMahon.—8 Bridge St. Bent rims, hickory and auto spokes and spoke billets.

NEW YORK—New York City (Cont.)

- Crescent Auto Top Co.—58 W. 43d St. Automobile tops, slip covers, dust hoods, extra seats and glass fronts.
- Crescent Parts Co., The.—1743 Broadway. Removable rims.
- Crown Battery Co.—992 Southern Blvd. Primary batteries.
- Davis-Bournonville Acetylene Development Co.—Room 1511, No. 90 W. St. Special automobile machinery.
- Demar Co., J. E.—244-248 W. 49th St. Auto tops, slip covers, and fittings.
- Demmerle & Co.—248 W. 23d St. Miscellaneous wearing apparel, caps, gloves, gauntlets.
- Devoe, T. W. & C. T. Raynolds Co.—Fulton and William Sts. Varnishes.
- Diamond Rubber Co.—1876 Broadway. Tires.
- Dien, Ch.—43-45 W. 34th St. Importer and American sales agent for Edouard Dubred & Co.
- Dieter Steam Engine Works.—123 Liberty St. Motors, boiler feed pumps.
- Dietz Co., R. E.—60 Laight St. Acetylene generators, lamps, water glass lamps.
- Dixon Crucible Co., Joseph.—68 Reade St. Graphite, grease.
- Downing, Chas. J.—54 Warren St. Selling agts. lamp burners, gas pliers, wire cutters, pinchers, battery connectors, tires, horns.
- Dow Tire Company.—104 W. 42d St. Factory, Bush Terminal, No. 2, foot 36th St., S. Brooklyn, N. Y. Inner tubes.
- Dressler & Co., Chas. E.—143-147 E. 23d St. Models, patterns, timing devices and repair work of every description.
- Duane & Co., W. J.—304 W. 54th St. Automobile tops, slip covers, trunk racks, wind shields, iron and steel work.
- DuBois Searchlight Co.—220 Broadway. Lamps.
- Ducker Co. Portable houses.
- Duplex Folding Pail Co.—420 W. 14th St. Collapsible buckets.
- Duplex Ignition Co., Inc.—307 W. 36th St. Spark plugs.
- Dusenbury, Louis.—86-88 North St. Automobile robes, cloth and carpet trimmings.
- Edwards & Co.—405 E. 144th St. Bells.
- Ehrlich & Son, J.—1345 Broadway. Eye shields.
- Elastro Company, The.—256 Broadway. Tire filling compound.
- Electric Contract Co.—202 Centre St. Primary batteries, spark coils.

NEW YORK—New York City (Cont.)

- C. & C. Electric Co.—143 Liberty St. Electric motors.
- Electric Signs & Signals Co. 177½ E. 87th St. Annunciators, automobile mirrors.
- Electric Storage Battery Co.—100 Broadway. Sales office. Exide storage battery.
- Ellsworth, J. M.—518 W. 22d St. Alloy steel automobile products.
- Emergency Spring Repairer Co.—80 Broadway. Spring repairers.
- Empire Automobile Tire Co.—148 Chambers St., 2230 Broadway.
- Empire Depth Gauge Co.—120 Liberty St.
- Empire Rubber Co.—115-117 Worth St. Lamp covers.
- Empire State Dry Battery Co.—70 Fulton St. Primary batteries and storage batteries.
- Engineering Specialty Co., Inc.—143 Liberty St. Electric generators, charging apparatus, magnetos and ignition dynamos.
- Eureka Pneumatic Spray Co.—92 Lafayette St. Air compressors.
- Eureka Spring Co.—347 Broadway. Machinery springs.
- Fahrig Metal Co.—316 Hudson St. Babbitt metals.
- Fickling & Co., Inc.—154 E. 57th St. Bodies, tops, slip covers, wind shields, folding seats, foot rests, coat rails, lamp covers, dust shields, tire covers, upholstering, trunk racks, tire irons, lamp brackets, battery boxes, tool boxes, auto fenders, relief springs, ignition and lighting systems.
- Firestone Tire & Rubber Co.—233 W. 58th St., nr. Broadway. Tires.
- Fisk Rubber Co.—754 7th Ave. Tires.
- Frasse & Co., Peter A.—92-94 Fulton St. Importers, tools, machinery.
- Frasse Co.—38 Cortlandt St. Lubricators, tools.
- Friedlander & Bro., Joseph.—8 Maiden Lane. Eye shields.
- F. R. V. Auto Parts Co.—116 Nassau St. Shock absorbers.
- Gaither-Owen Co.—40 W. 60th St. Carbureters.
- Gallaway, G. W.—322 Pearl St. Grease, oils.
- Gardam & Son, Wm.—45-51 Rose St. Special parts, machine work to order.
- Garvin Machine Co.—Spring and Varick Sts. Special automobile machinery, circulation pumps.
- Gas Engine & Power Co.—Morris Heights. Body irons, marine motors.
- Gautier & Co., D. G.—20 Cliff St. Drop forgings, gear blanks, chrome nickel steel.

NEW YORK—New York City (Cont.)

Gibbs & Bower Co.—150 Nassau St. Turntables.
 Geiszler Bros.—316 W. 42d St. Storage batteries and storage battery igniters.
 General Power Co., The.—100 William St. Charging apparatus.
 General Vehicle Co.—Broadway and 62d St. (G. V. trucks.)
 Gifford & Son, John A.—25 Park Pl. Lamp covers, machine works to order.
 Gilbert & Barker Mfg. Co.—80-82 4th Ave. and 82 John St. Gasoline storage tanks, gasoline gauges, funnels.
 Gilmore Co., R. M. Asbestos.
 Glaenzer & Co.—26-28 Washington Pl. Magnetos.
 Gleason Peters Air Pump Co.—Mercer and Houston Sts. Horns, oil guns, fuel air pumps, tanks, storage tanks, power driven tire pumps.
 Goodyear Tire & Rubber Co.—64th St. and Broadway. Tires.
 Gordon Battery Co.—223-231 E. 144th St. Primary batteries.
 Gould Storage Battery Co.—25 W. 33d St. Primary batteries, storage batteries.
 Graham & Co., John H.—113 Chambers St. Agents Hams lamps.
 Graham & Goodman.—51-55 W. 93d St. Shock absorbers.
 Gray & Co., Wm. S.—76 William St. Denatured alcohol.
 Greene, Tweed & Co.—17 Murray St. Lubricators, packing.
 Grip Nut Co.—152 Lake St. Lock nuts.
 Gunther's Sons, G. C.—184 5th Ave. Miscellaneous wearing apparel.
 Gutta Percha & Rubber Mfg. Co. Collapsible buckets.
 Hall, Chas. E.—108 Broadway. Wrenches.
 Hancock Inspirator Co.—85 Liberty St. Stampings.
 Hammacher, Schlemmer & Co.—133 4th Ave. Tools.
 Hardy Co., R. E.—86 Watts St. Spark coils, plugs, timers.
 Harburg Tire Co.—234 W. 58th St. Pneumatic tires.
 Harrington Lubricant Co. — 1691 Broadway. Oils.
 Harris Safety Co. Fire extinguishers.
 Hartford Suspension Co.—67 Vestry St. Shock absorbers.
 Havemeyer Oil Co.—80 Broad St. and 1906 Broadway. Grease, oils.
 Haws, George A.—73 Pine St. Cylinder oil, transmission gear case, anti-fluid, cup grease.
 Hayward & Co, S. F.—20 Warren St. Fire extinguishers:

NEW YORK—New York City (Cont.)

Healy & Co.—51st St. and Broadway. Wood and metallic bodies.
 Healy Leather Tire Co.—90 Gold St. Leather tires, tubes, non-skids.
 Heath Dry Gas Co.—1937 Broadway. Carbureters.
 Hendricks Bros. Sheet and rod brass and copper.
 Herz & Co.—203-205 Lafayette St. Storage batteries, gaskets, magnetos, ignition dynamos, shock absorbers, spark coils, spark plugs, timers, electric switches, pump tire inflators, wire terminals.
 Hildreth Varnish Co.—32 Broadway. Paints, varnishes.
 Hodgman Rubber Co.—806 Broadway. Collapsible buckets, auto tops, wearing apparel.
 Holcomb & Co.—45 Vesey St. Primary batteries, spark coils, spark plugs.
 Homan, J. & E.—380 West Broadway. Gasoline automobile motors.
 Hungerford Brass & Copper Co. Sheet and rod brass and copper, brass and copper metals, bronze metals, copper boiler shells.
 Hurd & Haggin.—316 Hudson St. Gasoline marine motors.
 Hutchinson Electric Horn Co.—1 Madison Ave. Horns.
 Indian Rubber and Gutta Percha Insulating Co.—253 Broadway. Insulated wire.
 Ingersoll-Rand Co.—11 Broadway. Air compressors, hose couplings.
 International Auto Horn Mfg. Co.—151 E. 126th St. Horns and tubing.
 Jones Speedometer Co.—Broadway and 76th St. Speedometers, odometers, automobile clocks, auto annunciators.
 Johns-Manville Co., H. W.—100 William St. Asbestos, fire extinguishers, gaskets, packing.
 Johnson & Co., Isaac G.—Spuyten-Duyvil. Malleable iron castings, steel castings, chrome nickel steel.
 Kalb & Berger Mfg. Co., Inc.—1565 Broadway. Wood and metallic bodies, transmission gears.
 Kalbfleisch, Franklin H.—Metropolis Bldg., 16th St. and Broadway. Sulphuric acid, electrolyte, distilled water, battery fluids, non-freezing compounds.
 Kanter Co., R. J.—647 Water St. Oils.
 Keasbey, Robt. A., Co.—100 N. Moore St. Packing.
 Kellogg & Co., E. H.—243-244 South St. Cylinder oil, gear case compound, oils and greases.
 Kent Spark Plug Co.—621 Broadway. Spark plugs.

NEW YORK—New York City (Cont.)

Kero Steam Co. (Waite & Son Co.)—102 Fulton St. Kerosene burners, generators, packingless throttle, blow torches.
 King Optical Co., Julius.—10-12 Maiden Lane. Goggles.
 Kirchberger & Co.—50 Warren St. Gas lamp burners.
 Koven & Bros., L. O.—50 Cliff St. Tanks.
 Laidlaw, Jr., Wm. R.—1771 Broadway. Automobile robes, cloth and paper trimmings.
 Lasky & Levy.—20-22 Waverly Pl. Caps.
 Lavalette & Co.—112 E. 42d St. Magnetos and ignition dynamos.
 Lehman Bros.—10 Bond St. Automobile heaters.
 Leng's Son & Co., John S.—33 Murray St. Tires, tubes, chains, lamps, bells, carbide, wrenches, pumps, odometers, horns, spark plugs, batteries, goggle jacks.
 Little Grant Mfg. Co.—88 Wall St. Fire extinguishers.
 Levy, Manassch.—182 Broadway. Automobile clocks.
 Lincoln Electric Co.—1-3 Union Square. Primary batteries, electric generators.
 Livingston Radiator Co.—10 E. 31st St. Radiators.
 Locke & Co.—218 W. 84th St. Wood and metallic bodies, dashes and fenders.
 Loring Auto Appliance Co.—Broadway and 63d St.; Factory, Somerville, Mass. Speed indicators.
 M. & A. Basket Co.—239 E. 27th St. Hampers.
 Magnolia Metal Co.—113-115 Bank St. Gasoline motors, carbureters, metals, babbitt metals.
 Manhattan Auto Top & Body Co.—249 W. 64th St. Automobile covers, automobile tops, glass wind shields.
 Manhattan Brass Co.—332 E. 28th St. Brass parts, moulding lamps, horns.
 Manhattan Electrical Supply Co.—17 Park Pl. Dry batteries, bells, spark coils.
 Manhattan Lamp Works.—530 W. 20th St. Acetylene generators, lamps.
 Manhattan Screw & Stamping Works.—West End Ave. and 67th St. Lamps, generators, exhaust horns, tire brackets, oil guns, pumps, tubing screens.
 Manhattan Storage Co.—1611 Broadway. Automobile supplies, tools, wearing apparel, tires, tire brackets, robe rails, foot rests, trunk racks.
 Mann & Co., Leon.—699 Broadway. Wearing apparel, coats.

NEW YORK—New York City (Cont.)

Manufacturers Selling Co.—1777 Broadway. Rubber cloth, cloth and carpet trimmings.
 Manzel Bros. Co.—317-319 Babcock St. Force feed lubricators.
 Marshall Chemical Co.—80 William St. Metal polishes.
 Marx & Rawolle.—98 William St. Anti-freezing solutions.
 Merchant & Evans Co.—242 Water St. Importers and manufacturers, Hele-Shaw clutches, change speed gears, metal tire cases, axles, frames, special steel.
 Model Mfg. Co.—15 Frankfort St. Timograph, tire chains.
 Morgan & Wright.—214 W. 47th St. Tires.
 Mattisse Mfg. Co.—411-413 E. 107th St. Lamp reflectors.
 McNab & Harlem Mfg. Co. Pipe brass fittings.
 Merrill Spring Co., E. R.—530 W. 28th St. Leaf springs.
 Mesinger Mfg. Co., H. & F.—1801-1807 First Ave. Pneumatic tires.
 Metal Stamping Co.—243 West St. Bow sockets, curtain fasteners, radiators, top fixtures, cloth and carpet trimmings, metal trimmings, seats.
 Meyrowitz Mfg. Co., Inc.—104 E. 23d St. Eye shields.
 Mezger, Inc., C. A.—203 W. 80th St. Spark plugs.
 Michlos, Wm. S.—253 Broadway. Portable cranes and hoists.
 Mica Mfg. Co.—307 W. Broadway. Mica, washers, tubes, case, spark plugs, insulators.
 Mietz, A.—138 Mott St. Air compressors, kerosene motors, circulating pumps.
 Mills Mfg. Co.—1368-1370 Broadway. Eye shields.
 Minett Varnish Co.—129 Pearl St. Varnishes.
 Minimax Company.—1161-1175 Broadway. Fire extinguishers.
 Monarch Fire Appliance Co.—249 Pearl St. Fire extinguishers.
 Monogram Crest and Sign Co.—125 E. 86th St. License numbers, monograms, name plates, steel stamps and stencils.
 Moore Co., Inc., Geo. P.—332 Broadway. Metal polish, fire and lamp covers, handles.
 Moore & Munger Co.—602 W. 52d St. Wood and metallic bodies, dashes, fenders, hoods.
 Mosler & Co., A. R.—163 W. 29th St. Spark plugs, plugs, timers, distributors.
 Motor Accessories Co.—14 Dutch St. Horns, chairs.

NEW YORK—New York City (Cont.)

Motor Top Co. of N. Y.—216 W. 50th St. Storm aprons and curtains, wood and metallic bodies, glass wind shields.
 Mullaney's Sons, James. Pipe and brass fittings.
 Muller, Albert.—205 W. 41st St. Storage batteries.
 Mundt & Sons, Chas.—441 Pearl St. Perforated metals.
 Munsell & Co., Eugene.—218 Water St. Eye shields, mica.
 Musliner & Co., Jos.—156 Maiden Lane. Oils, semi-solid oils.
 Mutual Auto Accessories Co., The.—1937 Broadway. Tire cement, eye shields, horns, hydrometers, jacks, automobile bodies, soap, hand soap.
 Nash & Bartlett.—Flatiron Bldg. Distributors for Commonwealth Rubber Co. for United States, except New England, Pennsylvania, Indiana and Michigan.
 Nash & Co., Geo.—224 Pearl St. Steel.
 Nathan Novelty Mfg. Co. Storm aprons and curtains, lamp covers, tire cases, automobile covers, rubber aprons, tool cases, inner tube cases.
 National Auto Top Co.—Main office, 1904 Broadway; factory, 244-250 W. 49th St. Automobile tops, glass fronts, folding wind shields, slip covers, dust hoods.
 National Casket Co.—48 Great Jones St. Lap robes, rain coats, automobile heaters.
 National Oil Pump & Tank Co.—120 Liberty St. Oil pumps, tanks, storage tanks.
 New Amsterdam Motor Co.—152 W. 56th St. Carbide.
 N. Y. Asbestos Mfg. Co.—123 Cortlandt St. Asbestos, gaskets.
 Newcomb Carburetter Co.—1900 Broadway. Carbureters.
 New England Auto Top Co.—229 W. 54th St. Wind shields, auto tops, slip covers.
 N. Y. & N. J. Lubricant Co.—14-16 Church St. Oils, oil guns.
 New York Anti-Puncture Tire Co.—132 W. 49th St. Tire fluid.
 New York Auto Lamp Co.—585 Washington St. Automobile lamps.
 New York Belting and Packing Co.—25 Park Pl. Solid tires.
 New York Carriage Top Co.—509 W. 30th St. Automobile tops.
 New York Coach & Auto Lamp Co.—794-798 10th Ave. Foot rests, acetylene generators, exhaust horns, adjustable lamp brackets, lamps, robe rails.

NEW YORK—New York City (Cont.)

New York Coil Co.—338-340 Pearl St. Spark coils.
 New York Dash & Fender Co.—516-520 W. 36th St. Dashes and fenders.
 New York Insulated Wire Co.—114 Liberty St. Insulated wire.
 New York Kerosene Oil Motor Co.—31 Burling Slip. Kerosene motors.
 New York Leather Coat Co.—207 Greene St. Miscellaneous wearing apparel.
 Newmastic Tire Co.—151 W. 68th St. Tire fluid.
 New York Motor Fabric Co.—32 Union Square. Tire cases, lamp covers.
 New York Sporting Goods Co.—17 Warren St. Tire cement, horns, jacks, hydrometers, eye shields, automobile bodies, soap, hand soap.
 New York Stencil Works.—100 Nassau St. Name plates, steel stamps and stencils.
 Nicholls, Wm. S.—253 Broadway. Portable cranes.
 Nicholson Mfg. Co., H.—68 Dey St. Washing apparatus.
 Niles-Bement-Pond Co.—111 Broadway. Screw machine products, tube expanders, special automobile machinery, portable cranes and hoists.
 Non-Explosive Safety Naptha Container Co.—1133 Broadway. Tanks.
 Oelschlager Bros.—42 E. 23d St. Eye shields.
 Ofeldt & Sons, August.—123 Liberty St. Body irons, gasoline and kerosene burners, boiler pumps.
 Okonite Co.—253 Broadway. Insulated wires.
 Our Own Mfg. Co.—568-574 Broadway. Miscellaneous wearing apparel.
 Pantasote Co., The.—11 Broadway. Artificial leather, cloth and carpet trimmings.
 Paris Auto Top Co.—236 W. 41st St. Automobile covers, automobile tops.
 Parker Stearns & Co.—228-229 South St. Tire patches, inner tire tubes.
 Parsell & Weed.—129-131 W. 31st St. Electric motors, patterns.
 Patterson, Gottfried & Hunter, Ltd.—146-150 Center St. Jacks, tools, tool bags, brass and copper tubings, wrenches, machine work to order.
 Payson Varnish Co.—141st St. and Walnut Ave. Varnishes.
 Pederson Mfg. Co.—400-412 E. 37th St. Gasoline, kerosene burners, brass couplings, lubricators, wrenches.
 Peerless Rubber Mfg. Co.—16 Warren St. Rubber mats.

NEW YORK—New York City (Cont.)

Pennsylvania Rubber Co. of N. Y.—1741 Broadway. Rubber mats.
 Perfect Reversing Gear & Supply Company, The.—45 Vesey St. Reversing gears.
 Perrett Storage Battery Co.—17 State St. Storage batteries.
 St. Storage batteries.
 Perrin Varnish Co.—1133 Broadway. Varnishes.
 Peugeot Freres.—296 Broadway. Chains, steel rims.
 Phoenix Appliance Co.—15 W. 28th St. Fire extinguishers.
 Pigot Sayer & Co.—135 William St. Grease, oils, oil cans.
 Pile Bloc Co.—253 Broadway. Storage batteries.
 Pinkus, Frederick B.—103 Franklin St. Acetylene generators, lamp lighting devices.
 Pneumatic L'Electric Co.—1591 Broadway. Pneumatic tires.
 Pneumatic Mfg. Co.—3 South St. Cushions.
 Poly-Phase Ignition System Co.—52 Broadway. Magnetos and ignition dynamos.
 Portable Construction Co.—16 S. William St. Portable garages and houses.
 Powell & Young.—52 W. 43d St. Clutches.
 Prentiss Tool & Supply Co.—115 Liberty St. Special automobile machinery.
 Prest-O-Lite Co.—1904 Broadway. Gas tanks, tire filling tanks.
 Prosser & Sons, Thos.—15 Gold St. Steel, chrome nickel steel.
 Rahmann & Co., Geo.—6 Ferry St. Belting.
 Raimes & Co.—50 Ferry St. Metal polishes.
 Rajah Auto Supply Co.—147 Washington St. Spark plugs, wire terminals.
 Raritan Woolen Mills.—14 White St. Cloth and carpet trimmings.
 Republic Rubber Co.—47 Warren St.
 Republic Rubber Tire and Shoe Co., The.—449 W. 53d St. Non-skids, tire treads.
 Revillon Bros.—15 W. 28th St. Automobile robes.
 Revillon Freres, Inc.—19 W. 34th St. Wearing apparel, caps, gloves, gauntlets, miscellaneous wearing apparel.
 Rex Fire Extinguisher Co.—74 Cortlandt St. Fire extinguishers.
 Roche, William.—40 W. Broadway. Primary batteries, spark coils.
 Rogers, Peet & Co.—258, 260 and 842 Broadway. Apparel, robes, shields.

NEW YORK—New York City (Cont.)

Rose, Clarence H.—1905 Park Row. Pipe, brass fittings.
 Roth Jack & Tool Co.—68 William St. Jacks.
 Royal Battery Co.—108-110 Duane St. Storage battery, lamps and attachments.
 Royal Lub. Oil Co.—116 Broad St. Oils, automobile body polishes, soaps, metal polishes.
 Royal Metal Steel Co., Inc.—24 State St. Steel, chrome nickel steel.
 Rubay, Leon.—1697 Broadway. Storage batteries, ball bearings, horns, lamps, magnetos and ignition dynamos, spark coils, spark plugs, insulated wire.
 Ruckert Compound Shock Absorber.—66 Leonard St. Shock absorbers.
 Ruszits Fur Co., John.—73-77 Mercer St. Wearing apparel.
 S. C. Fabric Tire Tread Co.—1900 Broadway. Non-skids, tire treads.
 Safety Insulated Wire & Cable Co., The.—114 Liberty St. Rubber covered, lead covered and armored cables.
 Safety Tank Co.—25 W. 42d St. Storage tanks.
 Saks & Co.—Broadway, 33d-34th St. Automobile robes, automobile caps.
 Samson Leather Tire Co.—1634-1642 Broadway. Non-skids, tire treads, leather tires, pneumatic tires.
 Sartus Ball Bearing Co.—155 Spring St. Ball retainers and separators.
 Scandinavian Fur & Leather Co.—Office, 16 W. 23d St.; factory, 129 W. 31st St. Automobile robes, wearing apparel, caps, gloves, gauntlets, miscellaneous.
 Scheidig & Co., John.—50 Maiden Lane. Eye shields, hydrometers, lamp reflectors.
 Schlosser Mfg. Co.—151 E. 126th St. Automobile marine motors.
 Schoening, M. E.—369 Broadway. Horns, exhaust horns.
 Schoonmaker, A. O.—221 Fulton St. Mica, washers.
 Schraeder's Sons., A.—32 Rose St.—Pressed steel products.
 Seaboard Rubber Co. Miscellaneous wearing apparel.
 Seabury Co., Chas. L.—Morris Heights. Body irons.
 Seitz, C.—205 E. 35th St. Tire cases.
 Shain, Chas. D.—70 Murray St. Wire terminals.
 Shrimpton Mfg. Co.—Church St. Nipples.
 Sier Bath Co.—143 W. 54th St. Metal gear wheels.

NEW YORK—New York City (Cont.)

Simmons Co., John.—104-110 Center St. Gauges, stampings, brass and copper tubings, safety valves.
 Saxon Lamp Co.—526-532 W. 28th St. Lamps, annunciators, generators.
 Slater & Sons, S.—47 North St. Cloth and carpet trimmings.
 Smith & Hemmingway.—296 Broadway. Jacks, tools, wrenches.
 Smith & Son, Ltd., S.—116 Broad St. Speed indicators.
 Spare Motor Wheel of America, Ltd., The.—Sales office, 2148 Broadway. Spare wheels.
 Spencer Optical Mfg. Co.—15 Maiden Lane. Eye shields.
 Spiral Nut Lock Co.—432 E. 71st St. Lock nuts and washers.
 Spiral Spring and Auto Co.—1709 Broadway. Supplementary spiral springs.
 Splitdorf, Chas. F.—261-265 Walton Ave. Spark coils, magnetos, commutators, spark plugs, switches.
 Sprague Electric Motor Co.—527 W. 34th St. Electric generators, electric motors.
 Stafford Co., N.—67 Fulton St. License numbers, monograms, name plates.
 Standard Auto Supply & Mfg. Co.—20 Broad St. Tire pressures, indicators, compression indicators.
 Standard Brake Co.—101 W. 66th St. Brakes, clutches, brake and clutch cork inserts.
 Standard Oil Co.—124 Maiden Lane. Grease, oils, semi-solid oils.
 Standard Varnish Works. 29 Broadway. Enamels, varnishes.
 Stanley & Patterson.—23 Murray, 27 Warren Sts., and 329 4th Ave. Electric flashlights, electric charging plugs, electric supplies.
 Stanley, J. T.—650 W. 30th St. Soap, metal polish.
 Star Lubricating Co.—232 W. 28th St. Oils.
 Stevens & Co.—99 Chambers St. Horns, nipples, pump inflators.
 Stearn & Co., Walter H.—540-550 W. 58th St. Bodies, tops.
 St. John Rubber Tire Co.—116 Broad St. Cushion tires.
 Stimpson & Son, E. B.—31 Spruce St. Washers.
 Stivers, R. M.—19 W. 62d St. Wood and metallic bodies.
 Stolp Guaranteed Shock Absorber.—20-22 Fletcher St. Shock absorber.
 Storage Battery Supply Co.—239 E. 27th St. Storage batteries, syringes, hydrometers, dome lamps.

NEW YORK—New York City (Cont.)

Stoutenborough, X.—277 Pearl St. Storage tanks.
 Sussfeld, Lorsch & Co.—37 Maiden Lane. Eye shields.
 Swan & Finch Co.—151 Maiden Lane. Oils.
 Swinehart Clincher Tire & Rubber Co. 1843 Broadway. Tires.
 Syracuse Smelting Works.—464 10th Ave. Babbitt metals, solder.
 Talmont Electrical Engineering Co.—88-90 Center St. Ammeters and voltmeters.
 Taliaferro, W. T.—258 Broadway. Gasolene funnels.
 Terrill Gas Machine Lighting Co.—75 Fulton St. Storage tanks.
 Tire Safety & Device Co.—214 W. 124th St. Tire valves.
 Toplitz, George.—878 Broadway. Ladies' and men's apparel.
 Tower & Lyon Co.—95 Chambers St. Screw drivers, wrenches, plyers.
 Traction Tread Tire & Tube Co.—1695 Broadway. Pneumatic tires.
 Trageser Steam Copper Works, John.—447-457 W. 26th St. Tanks, brass and copper tubing.
 Traver Blow-out Patch Co.—1265 Broadway. Tire patches.
 Trident Tire Co.—1593 Broadway. Pneumatic tires and rims, solid tires.
 Tripari Bros. & V. De Prisco Co.—Factory, cor. Broome and Mott Sts.; office, 179 Mott St. Horns, brass tubing, screens, bulbs.
 Twentieth Century Mfg. Co.—19 Warren St. Lamps.
 Uncas Specialty Co.—1691 Broadway. Sirens, horns.
 Utility Co., The.—233 Greenwich St. Hand soap, tire irons.
 United States Dash & Fender Co.—147 E. 42d St. Automobile tops.
 United States Industrial Alcohol Co.—100 William St. Denatured alcohol.
 United States Indestructible Gasket Co.—16 S. William St. Gaskets.
 United States Mineral Wool Co.—140 Cedar St. Gaskets.
 Valentine & Co.—257 Broadway. Paints, varnishes.
 Valvoline Oil Co.—11 Broadway. Oils.
 Victor Factories, The.—Broadway and 65th St. Windshields, slip covers, dust hoods.
 Victor Metals Co.—29 Broadway. Metal trimmings.
 Victor Shock-Absorber Co.—1937 Broadway. Shock absorbers.
 Walter & Sons, N. C.—194 William St. Monograms, mufflers.
 Wanckel, Manfred.—640 Madison Ave. Caps.

NEW YORK—New York City (Cont.)

Watres Mfg. Co.—1131 Broadway.
Exhaust horns.
Webb & Son, James A.—50-52 Stone St. Denatured alcohol.
Weed Chain Tire Grip Co.—28 Moore St. Anti-skid devices, tire chains.
Wells Light Mfg. Co., The—44-46 Washington St. Non-skidding tire covers.
Werner Car Importing Co.—110 W. 34th St. Shock absorbers.
Wildes, Thomas.—246 Water St. Bab-bitt metals, solders.
Wiley, C. A.—Nott Ave., Long Is-land City, N. Y. Varnishes.
Williams Co., John, The.—114 Liberty St. Steam engines.
Willis Co., E. J.—8 Park Place. Switches, mica spark plugs, grade-meters.
Winchester Speedometer Co., Inc.—Motor Mart, 62d St. and Broadway. Speedometers.
Winn Co., F. R.—174 Maiden Lane. Oils.
Winn, Wm. R.—143 Maiden Lane. Lubricating oils, steam packing, rubber hose.
Witherbee Igniter Co.—541 W. 43d St. Storage batteries, mica, spark plugs, coils, switches, timers, wires, boat meters, electric fittings, volt-meters.
Wood & Son, Frederick R.—219 W. 19th St. Storm aprons and curtains, wood and metallic bodies, automo-bile covers, automobile tops.

Publications.

American Chauffeur.—1931 Broadway.
American Institute of Electrical En-gineers (Transactions).—Published at 25 W. 39th St.
American Machinist.—Published at 505 Pearl St.
American Magazine of Aeronautics.—142 W. 65th St., publication offices.
American Society of Civil Engineers (Proceedings).—Published at 320 W. 57th St.
American Society of Mechanical En-gineers (Transactions).—25 W. 39th St.
Automobile Blue Book (Class Journal Pub. Co.), Flatiron Bldg.
Automobile Dealer & Repairer.—27 Park Pl.
Automobile Dealer & Repairer.—The Motor Vehicle Publishing Co., 24 Murray St.
Automobile, The.—(Class Journal Pub. Co.), Flatiron Bldg.
Automobile Topics. (The only weekly published for automobile owners).—Times Bldg., Times Square.
Bicycling World & Motorcycle Re-view.—154 Nassau St.

NEW YORK—New York City (Cont.)

Cassier's Magazine.—3 W. 29th St.
Commercial Vehicle, The.—1402 Broadway.
Electrical Review.—13 Park Row.
Electrical World.—239 W. 39th St.
Engineering Record, The.—239 W. 39th St.
Horseless Age, The.—9-15 Murray St.
Hub, The.—24 Murray St.
India Rubber World.—35 W. 21st St.
International Motor Cyclopædia.—Times Bldg.
Iron Age, The.—14 Park Pl.
Machinery.—49 Lafayette St.
Motor.—(New Publication Co.), 2 Duane St.
Motor Boat.—1133 Broadway.
Motor Boating Magazine.—138 Liberty St.
Motor Car Magazine.—108 Fulton St.
Motorcycle Illustrated, The.—Drexel Bldg., Broad and Wall Sts.
Motor World.—154 Nassau St.
Power.—505 Pearl St.
Rudder, The.—9 Murray St.
Scientific American.—361 Broadway. (Weekly.)
Technical Literature Co., The.—220 Broadway.
Yachting.—(Yachting Pub. Co.), 20 Vesey St.

Recharging Batteries.

DeWitt Auto Co., The.—248-250 W. 80th St. Garage, repairing.

Renting.

Allenhurst Garage & Auto Station.—135-137 W. 37th St. Garage, repair-ing.
Automobile National Renting Co.—109 W. 37th St.
Auto-Packard Renting Co.—1499 Broadway.
Auto Renting & Touring Co.—N. W. cor. Broadway and 54th St.
Bryant Motor Co.—110 W. 41st St.
Crescent Auto Top Co.—58 W. 43d St.
Darling, K. C.—1686 Broadway. (Sec-ond-hand cars.) Supplies.
New Amsterdam Motor Co.—152 W. 56th St.
New York Transportation Co.—Office and garage, Eighth Ave. and 49th St. Garages: 350 W. 50th St., 66th St. and Third Ave., Ninth Ave. and 27th St., Bowery and Bay-ard St. Stands: Cafe Martin, Sherry's, Hotel Astor, L. I. R. R. ft. E. 34th St., C. R. R. of N. J. and D. L. & W. R. R. ft. W. 23d St.
New York Taxicab Co.—Office 546 Fifth Ave. Stands: Hotel Imperial, Hotel Knickerbocker, Hotel Nether-lands, Hotel Plaza.

NEW YORK—New York City (Cont.)

Parkway Garage Co., The.—Central Park West & 110th St.

Peets, C. S.—109 W. 37th St.

St. Nicholas Ave. Garage.—649-51 St. Nicholas Ave.

Thedford's Garage.—315 W. 96th St.

West End Automobile Palace.—212 W. 89th St.

West End Garage.—266 W. 135th St.
Yorkville Auto Renting Co.—64 W. 63d St.

Repairing, Automobile.

Acme Mfg. Co.—210 W. 26th St.

Allenhurst Garage & Auto Station.—135-137 W. 37th St. Renting, garage.

Anderson & Wilkens.—125 W. 49th St.

Auto Garage Co.—146 W. 39th St.

Automobile Exchange & Storage Co.—133-5-7-9 W. 38th St. (Second-hand cars.) Garage.

Automobile School of America.—742 7th Ave.

A. Z. Co., The.—527 W. 56th St.

B. & H. Motor Car Co.—147-149-151 W. 49th St. Garage.

Barwise, R. M.—170th St. and Jerome Ave. Garage.

Blair Tool & Machine Works.—24-27 West St.

Bowman Automobile Co., Sidney B.—225-231 W. 49th St. (Importer, Clement-Bayard; Agent, Apperson.) Garage.

Bryant Garage.—50-56 W. 43d St. Garage.

Chelsea Auto Storage Co.—516 W. 37th St. (Manhattan.) Garage.

Colonial Garage.—220 W. 30th St. (Second-hand cars.) Garage.

Cryder & Co.—N. E. Cor. Park Ave. and 63d St. (Mors, Renault, Leon Bollée.) Garage.

Detroit Motor Car & Supply Co.—Bet. 79th and 80th Sts, Broadway. (American Tourist, Overland.) Repair cars represented.

DeWitt Auto Co., The.—248-250 W. 80th St. Charging batteries, garage.

Duerr & Co., C. A.—77th St. and Broadway. (Royal.) Garage.

Edelman, Wm.—914 Pelham Ave.

Empire State Motor Car Co.—2148-2150 Broadway. (Craig-Toledo, Queen.) Garage.

Garford Motor Car Co.—1540-1542 Broadway. (Garford.)

Gerome, T. F.—130-132 W. 18th St. Garage.

Guarantee Auto Co.—162 W. 56th St.

Hartford Suspension Co.—67 Vestry St., and 212 W. 88th St. (Gobron-Brillie.) Garage.

Haynes Automobile Co.—1715 Broadway. (Haynes.)

Hol-Tan Co., The.—244 W. 49th St. (Hol-Tan, Fiat.) Repairing.

NEW YORK—New York City (Cont.)

La France Motor Co.—753 5th Ave. (Cottin & Desgouttes.) Repairing.

Motor Car Maintenance Co.—247-249 W. 49th St. Garage.

Motor Car Repair Co.—38-40 W. 43d St.

National Auto Top Co.—Main office, 1904 Broadway; factory, 244-250 W. 49th St.

New Amsterdam Motor Co.—152 W. 56th St. (Crawford.)

Palmer & Singer Mfg. Co.—1620-1624 Broadway. (Simplex, P. & S.) Garage.

Parkway Garage Co.—Central Park West and 110th St. Garage.

Quackenbush, W. F.—1287 Madison Ave.

Ranney & Co., A. Elliott.—1851 Broadway. (Elmore.) Garage.

Saratoga Auto Top Co.—107 W. 46th St.

Scott Motor Co., Geo. J., The.—1720-1722 Broadway. (Glide.) Garage.

Smith & Co., W. R.—306 W. 52d St.

Southworth Co., A. J.—1733 Broadway. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)

Spalding & Bros, A. G.—29 W. 42d St. (Stevens-Duryea.) Garage.

Speedway Garage.—414 W. 155th St. Garage.

St. Nicholas Ave. Garage.—649-51 St. Nicholas Ave.

Victor Auto Storage Co.—147 W. 55th St. Garage.

Waltham Mfg. Co.—1615 Broadway. (Waltham.)

West End Garage.—266 W. 135th St.

Welch Motor Car Co.—1871-1873 Broadway. (Welch.) Repairing Welch cars only.

White Auto Repair Co.—164 W. 46th St.

Wyckoff, Church & Partridge.—Broadway, at 56th St. (Stearns, C. G. V.) Supplies, garage.

Supplies, Automobile.

Automobile Owners' Supply Co.—1665 Broadway.

Automobile Supply Co., The.—1733-1737 Broadway.

Bean, Sidney A.—1780-1782 Broadway.

Broadway Bicycle & Auto Supply Co.—60 Vesey St.

Brooke Automobile Supply Co.—197 Fulton St.

Da-An-Nite Auto Supply Co.—1912 Broadway.

Darling, K. C.—1686 Broadway. (Second-hand cars.) Renting.

Dyde & Richards Auto Supply Co.—1691 Broadway.

Eagle Auto Supply Co.—1780 Broadway.

NEW YORK—New York City (Cont.)

Frasse & Co. Peter A.—92-94 Fulton St.
 General Automobile Supply Co.—1671 Broadway.
 Gorman Supply Co., The.—134 E. 25th St., Rooms 29 and 30.
 Kasner, A. H.—152 Church St.
 Manhattan Storage Co.—1611 Broadway.
 Miller, Chas. E.—97-101 Reade St. (Manufacturer, jobber, exporter, importer.)
 Miller, Chas. E.—924 8th Ave. (Manufacturer, jobber, exporter, importer.)
 Moore, Co., Inc., Geo. P.—332 Broadway.
 Motor Parts Co.—25 W. 42d St.
 National Casket Co.—48 Great Jones St.
 National Sales Corporation.—296 Broadway. Importers and distributors.
 New York & Brooklyn Auto Supply Co.—1693 Broadway.
 New York Sporting Goods Co.—17 Warren St.
 Patterson, Gottfried & Hunter, Ltd.—146-150 Center St.
 Rubay, Leon.—1697 Broadway.
 Shain, Chas. D.—70 Murray St.
 Siegel Cooper Co.—6th Ave., 18th to 19th Sts.
 Smith-Haines.—1673 Broadway.
 Sports, Ltd.—2049 Broadway.
 Stevens & Co.—99 Chambers St.
 35 Per Cent. Auto Supply Co.—83 Chambers St.
 W. C. P. Automobile Supply House.—1739 Broadway.
 Widmayer, F. B.—2312 Broadway, nr. 84th St.
 Willis Co., E. J.—8 Park Pl.
 Winn, Wm. R.—143 Maiden Lane.
 Wooster Auto Co.—88 Chambers St.
 Wyckoff, Church & Partridge.—Broadway, at 56th St. Supplies, garage, repairing.
Vulcanizing and Tire Repairing.
 Automobile Tire Co.—1578 Broadway.
 Broadway Rubber Tire Works.—1900 Broadway.
 Meyers & Greyson.—1608 Broadway.
 New York Steam Rubber Tire Repair Works.—306 W. 52d St.
 O'Conner, M.—201 W. 48th St.
 Universal Tire Repair Co.—1900 Broadway.
 Vulcan Tire Repair Co.—227 W. 53d St.

NIAGARA FALLS—

Automobile Agents and Dealers.
 Christ, G. B. (Maxwell.)

NEW YORK (Continued)

Niagara Falls Automobile Transit Co.—103 Main St. (Cadillac, Winton.)
 Garage, repairing, supplies.
 Rae, G. & J. M.—106 Falls St. (Ford.)
Garages.
 Cataract Machine & Automobile Co.—1-3 W. Niagara St.
 Clifton Hotel Garage.—Upper Bridge.
 Gaiser's Garage.—103 Main St.
 Harris & Willson.—326 Main St.
 Niagara Falls Automobile Transit Co.—103 Main St. (Cadillac, Winton.)
 Repairing, supplies.
Parts and Accessories Manufacturers.
 Aluminum Co. of America.—Lower End Canal Basin. Aluminum.
 Aluminum Co. of America.—Upper End Canal Basin. Aluminum.
 Aluminum Co. of America.—Buffalo Ave. and 19th St. Aluminum ...
 Carborundum Co., The.—Buffalo and 18th Sts. Emery wheels.
 Frontier Brass Foundry Co.—Whitney Lane. Brass castings.
 Niagara Iron, Steel and Metal Co.—835 Ashland St. Iron and steel sheet and bar.
 Niagara Surface Coating Co.—Erie and 9th Sts. Varnish.
 Norton Emery Wheel Co.—Buffalo Ave. Emery wheels.
 Visor Knitting Co. Mufflers.
Repairing, Automobile.
 Niagara Falls Automobile Transit Co.—103 Main St. (Cadillac, Winton.)
 Supplies, garage.
Supplies, Automobile.
 Niagara Falls Automobile Transit Co.—103 Main St. (Cadillac, Winton.)
 Garage, repairs.
 Niagara Tachometer & Instrument Co.—26th and Adams Sts.
NORTH TONAWANDA—
Garages.
 Jones, E. E.—9-11 Tremont St.
 Zimmerman-Smith Co., The.—72 Main St.
Motorboat Manufacturers.
 Less-More Valveless Engine Co.
 Niagara Motor Boat Co.
Parts and Accessories Manufacturers.
 Herschell-Spillman Co. Automobile and marine motors.
NORWICH—
Clubs and Associations.
 Chenango County Automobile Club.—B. W. Stover, Sec.
Automobile Agents and Dealers.
 Latham, C. H. (Buick.)
Garages.
 Norwich Motor & Machine Co.—30 Lackawanna Ave.
NYACK—
Automobile Agents and Dealers.
 Nyack Auto Garage.—68 Burd St. (Maxwell.)

NEW YORK (Continued)

Randolph, T. (Holsman.)

Writer, Geo. S. (Ford.)

Garages.

Offeldt & Sons, F. W.

Motorboat Manufacturers.

Ayers & Son, A.

Parts and Accessories Manufacturers.

Offeldt & Sons, F. W. Water tube boilers, kerosene burners, automatic fuel regulator, automatic water regulator, feed water heaters, steam engines.

OAKFIELD—

Automobile Agents and Dealers.

Spear, C. A. (Waltham.)

OGDENSBURG—

Automobile Agents and Dealers.

Hannan & Henry Motor Co.—29-31 Catherine St. (Cadillac, Buick.)
Garage, repairing.

Garages.

Hannan & Henry Motor Co.—29-31 Catherine St. (Cadillac, Buick.)
Repairing.

Louis, C.—19 S. Water St.

Motorboat Manufacturers.

Legare, J. L.

Parts and Accessories Manufacturers.

Dunn, Walter E. Marine motors.

Repairing, Automobile.

Hannan & Henry Motor Co.—29-31 Catherine St. (Cadillac, Buick.)
Garage.

OLEAN—

Clubs and Associations.

Cattaraugus County Automobile Club.
— George Forbes, Sec.

Automobile Agents and Dealers.

Forbes, George.—Union St. (Ford.)
Kreidler Bros.—214 State St. (Cadillac, Winton.)

Garages.

Alger, P. B.—244 Union St.
Olean Garage Co.—481 Union St.
Smith Garage & Repair Co., Geo.—
257 N. Union St. Repairs, supplies.
Repairing, Automobile.

Smith Garage & Repair Co., Geo.—
257 N. Union St. Supplies, garage.
Supplies, Automobile.

Smith Garage & Repair Co., Geo.—
257 N. Union St. Garage, repairs.

ONEIDA—

Clubs and Associations.

Oneida Automobile Club.—H. C. Stone, Sec.

Automobile Agents and Dealers.

Silver Carriage Co.—52 Cedar St. (Maxwell, Ford.)

Parts and Accessories Manufacturers.

Halliday, C. A.—42 Cedar St. Cloth and carpet trimmings.

Oneida Rubber Tire Works. Solid tires.

NEW YORK (Continued)

Schubert Bros. Gear Co.—42-44 Cedar St. Bodies, trunk racks, tire holders, removable seats, tops, slip covers, fenders.

ONEONTA—

Automobile Agents and Dealers.

Butts, A. M.—240 Main St. (Elmore.)

Murdock Bros. (Maxwell.)

Oneonta Automobile Garage.—23 Dietz St. (Haynes, Orient, Oldsmobile, Waltham.)

OSWEGO—

Clubs and Associations.

Oswego Automobile Club.—N. L. Bates, Sec.

Automobile Agents and Dealers.

Bulger, W. J. (Jewel.)

Garages.

Keating Garage Co.—145 W. 2d St. Supplies, repairing.

Ontario Garage Co.—103 W. 2d St.

Parts and Accessories Manufacturers.

Aluminum Solder & Refining Co. Aluminum solder.

Barnes Gear Co. Steering apparatus.

Kitts Mfg. Co.—111-115 Water St. Water alarms and columns.

Steam Carriage Boiler Co. Body irons, gasoline kerosene burners.

Repairing, Automobile.

Keating Garage Co.—145 W. 2d St. Garage, supplies.

Supplies, Automobile.

Keating Garage Co.—145 W. 2d St. Repairing, garage.

OVID—

Garages.

Covert & Williamson.

OWEGO—

Automobile Agents and Dealers.

Willys Crew Motor Car Co.—Main St., branch of Elmira. (Rambler, White, Premier, Pope-Waverley, Ford, American.) Garage, repairs, supplies.

Automobile Manufacturers, Electric, Commercial.

Champion Wagon Co.

Garages.

Stevens, N. A.—Temple St., nr. N Ave.

Willys Crew Motor Car Co.—Main St., branch of Elmira. (Rambler, White, Premier, Pope-Waverley, Ford, American.) Repairs, supplies.

Repairing, Automobile.

Willys Crew Motor Car Co.—Main St., branch of Elmira. (Rambler, White, Premier, Pope-Waverley, Ford, American.) Supplies, garage.

Supplies, Automobile.

Willys Crew Motor Car Co.—Main St., branch of Elmira. (Rambler, White, Premier, Pope-Waverley, Ford, American.) Repairs, garage.

NEW YORK (Continued)

OXFORD—

Garages.

Oxford Automobile Co.—N. Canal St.

PALMYRA—

Automobile Agents and Dealers.

Garlock & Co., O. J. (Peerless.)

PATCHOGUE, LONG ISLAND—

Automobile Agents and Dealers.

Gray, W. C. (Maxwell.)

Garages.

Roe & Sons, Justus.—52 E. Main St.

PEEKSKILL—

Automobile Agents and Dealers.

Croft, W. H. (Maxwell.)

Davis, F. W. (Waltham.)

Lawson's Garage.—810-12-14-16 South St. (Cadillac, Pope-Hartford, Pope-Toledo.) Garage, repairs, supplies.

Martin, Jos. (Maxwell.)

Selleck, John L.—South St. and Union Ave. (Rambler, Marion.)

Scowden, John W. (Winton.)

Garages.

Lawson's Garage.—810-12-14-16 South St. (Cadillac, Pope-Hartford, Pope-Toledo.) Repairs, supplies.

Winn, C. H.—621 South St.

Parts and Accessories Manufacturers.

Miller Mfg. Co., The.—813 Central Ave. Searchlights, generators, pumps, oil guns, automobile jacks.

Repairing, Automobile.

Lawson's Garage.—810-12-14-16 South St. (Cadillac, Pope-Hartford, Pope-Toledo.) Supplies, garage.

Supplies, Automobile.

Lawson's Garage.—810-12-14-16 South St. (Cadillac, Pope-Hartford, Pope-Toledo.) Garage, repairing.

PLATTSBURG—

Automobile Agents and Dealers.

Dale, Chas. J. (Northern.)

Ramsay, B. S. (Waltham.)

PORT CHESTER—

Automobile Agents and Dealers.

Minchin, C. H. (Waltham.)

Raban & Johnston.—34 Broad St. (Reo, Premier.)

Stinemetz, Fred. (Maxwell.)

Garages.

Campana, John M.—Post Road.

Jencick Motor Mfg. Co.—N. Main St.

Parts and Accessories Manufacturers.

Jencick Motor Mfg. Co. Gasolene automobile motors, gasolene marine motors.

Russel, Burdsall & Ward Bolt and Nut Co. Nuts.

PORT JEFFERSON—

Garages.

Randall, A. W.—Jones St.

PORT JERVIS—

Automobile Agents and Dealers.

Case Co., Geo. W.—54 Front St. (Rambler, Ford.) Garage, repairing.

NEW YORK (Continued)

Rutan & Co., P. C.—46 Front St. (Pope-Hartford.) Garage, repairing

Garages.

Case Co., Geo. W.—54 Front St. (Rambler, Ford.) Repairing.

Rutan & Co., P. C.—46 Front St. (Pope-Hartford.) Repairing.

Repairing, Automobile.

Case Co., Geo. W.—54 Front St. (Rambler, Ford.) Garage.

Rutan & Co., P. C.—46 Front St. (Pope-Hartford.) Garage.

PORT RICHMOND, S. I.—

Motorboat Manufacturers.

American Dynamic Co.

PORT WASHINGTON, L. I.—

Motorboat Manufacturers.

Manhasset Shipbuilding and Repair Co.

POUGHKEEPSIE—

Clubs and Associations.

Hudson Valley Automobile Club of Poughkeepsie.—Otis W. Sherman, Sec.

Automobile Agents and Dealers.

Hawkey & Kelder.—34 Market St. (Maxwell.)

Hill, C. H.—234 Main St. (Reo, Premier.)

Lane Motor Vehicle Co.—Prospect St. (Lane.)

Miller, Dr. C. D. (White.)

Nelson House Garage.—34 Market St. (Maxwell.)

Sague & Son, Horace.—184-192 Church St. (Cadillac.) Supplies, garage, repairs.

Van Benschoten, John.—14-20 Catherine St. (Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Mitchell, Lozier.) Supplies, garage, repairing.

Von der Linden, H.—52 Market St. (Rambler.)

Automobile Manufacturers, Steam.

Lane Motor Vehicle Co.

Garages.

De Lamater, E. B.—50 Market St.

Sague & Son, Horace. (Cadillac.) Repairing, supplies.

Van Benschoten, John.—14-20 Catherine St. (Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Mitchell, Lozier.) Repairs, supplies.

Repairing, Automobile.

Sague & Son, Horace. (Cadillac.) Garage, supplies.

Van Benschoten, John.—14-20 Catherine St. (Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Mitchell, Lozier.) Supplies, garage.

NEW YORK (Continued)

Supplies, Automobile.

Sague & Son, Horace. (Cadillac.)
Garage, repairs.

Van Benschoten, John.—14-20 Catherine St. (Thomas Flyer, Stevens-Duryea, Pope-Waverley, Pope-Hartford, Mitchell, Lozier.) Garage, repairs.

PRINCEBAY—

Automobile Agents and Dealers.

Wincapaw & Co., C. C. (Waltham.)

QUOGUE—

Garages.

Quogue Automobile & Bicycle Co.
—Jessop Ave. Repairing, supplies.

Repairing, Automobile.

Quogue Automobile & Bicycle Co.
—Jessop Ave. Garage, supplies.

Supplies, Automobile.

Quogue Automobile & Bicycle Co.
—Jessop Ave. Garage, repairs.

RED HOOK—

Automobile Agents and Dealers.

Cadillac Co. of Dutchess Co. (Cadillac.)

Havens, Beckwith. (Waltham.)

RHINEBECK—

Automobile Agents and Dealers.

Traver, Judson D. (Waltham.)

Garages.

Fraleigh Bros.—W. Market St.

Smillie & Co., Harry.—Mill and Market Sts.

Snyder, Clark.—Mill St.

RIVERHEAD, LONG ISLAND—

Automobile Agents and Dealers.

Moutoux, E. (Maxwell.)

ROCHESTER—

Clubs and Associations.

Rochester Automobile Club.—B. Van Tuyle, Sec.; 25 Plymouth Ave.

Society of Automobile Engineers.—42 East Ave.

Automobile Agents and Dealers.

Bauer, Geo. J.—112 Exchange St. (Aerocar.)

Farnsworth & Glidden.—28 Euclid St. (Welch.)

Genesee Motor Vehicle Co.—Court and Exchange Sts. (Corbin.)

Hart, A. V.—30 Carleton St. (Thomas Flyer, Elmore, Haynes, Studebaker.)

Jenkins, J. W.—237 Rutgers St. (Jenkins Spec.)

Kirkpatrick, L. B. (Holsman.)

Kraft, Victor L.—44 N. Water St. (Monarch.)

Leach, A. R.—580 Lake Ave. (Queen, De Luxe.)

Mabbett, F. A.—191 W. Main St. (Cadillac, Oldsmobile.)

Mandery, J. J.—150 South Ave. (Columbia.)

NEW YORK (Continued)

McNall, Arthur.—East Ave. and S. Union St. (Peerless, Franklin, Rauch & Lang.)

Northway, Thos. J.—92 Exchange St. (Rainier, Rambler, Ford, White, Reo.)

Rochester Automobile Co.—158 South Ave. (Lansden, Columbia, Baker, Matheson, Packard, Winton.)

Schoeffel Auto & Livery Co.—26 Plymouth Ave. (Royal.)

Thomson Co., Robert, The.—254 Court St. (Pope.)

United States Automobile Co.—21-29 Plymouth Ave., nr. Main St., W. (Locomobile, Stevens-Duryea, Pierce Arrow, Stearns.) Supplies, garage, repairing.

University Auto Co.—30 Carlton Pl. (Mitchell.)

Whiting, C. L.—591 Main St., E. (Buick.)

Zimbrich, A. M.—45-47-49 South Ave. (Maxwell, Marmon, Stoddard-Dayton, Dolson.)

Automobile Manufacturers, Gasolene.
Gearless Transmission Co.

Jenkins, J. W.

Mora Motor Car Co.—317 Livingston Bldg.

Selden Motor Vehicle Co.—701 German Ins. Bldg.

Trebert Gas Engine Co.

Garages.

Auto Hospital.—425 Lake Ave.

Becker & Kurtz.—456 State St.

Schirck, E.—22 Spring St.

State Street Garage.—468 State St.

United States Automobile Co.—21-29 Plymouth Ave., nr. Main St., W. (Locomobile, Stevens-Duryea, Pierce Arrow, Stearns.) Repairs, supplies.

Motorboat Manufacturers.

Beers Bros. Engine Co.

Rochester Gas. Eng. Co.

Motorcycle Agents and Dealers.

Forest & Malone.—10 Norcross Ave. (Merkel.)

Miner Co., Geo. L. S., The.—Carlton Ave., cor. Court St. (Indian.)

Parts and Accessories Manufacturers.

Ashle Machine Wks.—714 University Ave. Machine work to order, steering apparatus, universal joints.

Auburn Ball Bearing Co. Ball bearings, hubs.

Autmo Cabinet Co., The.—Cox Bldg. Tools, vises.

Bausch & Lomb Optical Co. Lamp reflectors.

Brownell Motor Co., F. A.—634-636 Lexington Ave. Auto and marine motors, transmissions, carbureters, circulating pumps.

NEW YORK (Continued)

Clarke Novelty Co.—380 Exchange St. Metal specialties and tire clamps.
 Clum & Atkinson.—575 Lyell Ave. Brass, bronze, aluminum, phosphor bronze, manganese bronze, white brass castings, babbitt metal, white brass, bearing metals, aluminum solder, brass unions.
 Crosby, Frisian Fur Co.—116 Mill St. Automobile robes, wearing apparel, gloves, gauntlets.
 Gearless Transmission Co. (Gearless cars.) Gearless transmissions.
 Hall, Inc., E. H.—12 Elm St. Carbureters, dashes, fenders.
 Ham Mfg. Co., C. T.—731 Oak St. Cold blast side and tail lamp.
 Hutchinson & Co., W. R.—15 Caledonia Ave. Cloth and carpet trimmings.
 Ideal Carriage Washer Co.—383 Main St. Automobile washing apparatus.
 Kellogg, G. W.—9 Belmont St. Tire valve pump connections.
 Long & Mann Co.—Beehive Bldg., Grave St. Tools, rims.
 Marson Vulcanizing Works.—125 W. Main St. Vises.
 Morse & Son, C. H.—13 S. Water St. License numbers, name plates.
 Mosher Sales Co.—32 St. Paul St. Oilers.
 National Casket Co. Lap robes, rain coats, automobile heaters.
 Puritan Soap Co.—500-502-504 Exchange St. Automobile soap, metal polishes.
 Rochester Gas Engine Co.—705 Driving Park Ave. Marine motors.
 Rochester Machine Tool Works, Ltd. Body irons, steam engines.
 Rolfe-Fox Co.—402 W. Livingston Bldg. Lamp lighting devices.
 Sager Co., J. H. Non-skids, shock absorbers, tire chains.
 Taylor Brothers Co. Hydrometers.
 Thompson, J. Northway.—102 Exchange St. Adjustable lamp brackets.
 Toledo Metal Wheel Co. Nipples.
 Trebert Gas Engine Co.—35-37 Ford St. Gasolene motors.
 Vacuum Oil Co. Oils.
 Vogt Mfg. & Coach Lace Co.—322-324 St. Paul St. Cloth and carpet trimmings.
 Wray Pump & Register Co.—191-193 Mill St. Pressure gauges, tire pumps.
Repairing, Automobile.
 Fitt, James.—106 Commercial St.

NEW YORK (Continued)

Repairing, Automobile.
 United States Automobile Co.—21-29 Plymouth Ave., nr. Main St., W. (Locomobile, Stevens-Duryea, Pierce Arrow, Stearns.) Supplies, garage.
Supplies, Automobile.
 Roby Co., Sidney B.—208 South Ave.
 United States Automobile Co.—21-29 Plymouth Ave., nr. Main St., W. (Locomobile, Stevens-Duryea, Pierce Arrow, Stearns.) Garage, supplies.
ROME—
Automobile Agents and Dealers.
 Noonan Tool & Machine Works. (Rambler.)
Garages.
 Haynes, A. K. & L. B.—144 N. Washington St.
Parts and Accessories Manufacturers.
 Baum's Castorine Co.—104 George St. Engine oil, varnish, hand soap, cup and transmission grease, radiator compounds.
 Long-Turney Mfg. Co. Condensers, hoods.
 Maxwell & Fitch Co. Motors, carbureters.
 Noonan Tool & Machine Works. Brass, bronze, aluminum and copper castings, license numbers, brass and nickel plating tools, trunk racks, valve mufflers and lifters, wire terminals.
 Rome Brass and Copper Co. Sheet and rod brass and copper, brass and copper tubing.
 Rome Soap Mfg. Co. Hand soaps.
RONDOUT—
Repairing, Automobile.
 Livingston, C. V.
RYE—
Automobile Agents and Dealers.
 Edwards & Peck. (Pope-Hartford.)
 Werner, Geo. J. (Maxwell.)
Motorboat Manufacturers.
 Milton Point Shipyard.
SACKETS HARBOR—
Automobile Agents and Dealers.
 Knowlton, E. C. (Waltham.)
SAG HARBOR—
Garages.
 Youngs, H. M.
ST. ALBANS—
Automobile Agents and Dealers.
 St. Albans Foundry Co. (Rambler.)
Garages.
 Bedard & Carlisle.—Lake St.
SALAMANCA—
Automobile Agents and Dealers.
 Salamanca Cycle Works.—5 River St. (Detroit.)
SANDY HILL—
Clubs and Associations.
 Adirondack Automobile Club.—E. E. Rugus, Sec.

NEW YORK (Continued)

Automobile Agents and Dealers.
Smith, A. E. (Maxwell.)

SARATOGA—

Automobile Agents and Dealers.
Hodges, W. L.—16 Woodlawn Ave. (Waltham.)

Ketchum, J. P.—60 Putnam St. (Packard, Cadillac.) Garage.

Tarrant, W. P.—12 Maple Ave. (Dolson.)

Garages.

Ketchum, J. P.—60 Putnam St. (Packard, Cadillac.)

Ward's Auto Garage.—23 Lafayette St.

SARATOGA SPRINGS—

Automobile Agents and Dealers.
Gagemobile Co. (White.)

Smith, J. A. (Thomas Flyer.)

SAYVILLE—

Automobile Agents and Dealers.
Stenger & Rohm.—Main St. (Ford.)

SCHENECTADY—

Clubs and Associations.

Automobile Club of Schenectady.—A. F. Knight, Sec.

Automobile Agents and Dealers.

Close Bros.—405 Smith St. (Knox, Cadillac.) Supplies, garage, repairs.

Latham. (Ford, Corbin.)

Schenectady Automobile Exchange & Supply Co. (Maxwell.)

Vrooman Bros.—1259 State St. (Elmore, Waltham.) Garage, repairing.

Vrooman, C. Stuart V.—8 Yates St. (Haynes.) Garage.

Garages.

Burtis & Son.—18 Jay St.

Close Bros.—405 Smith St. (Knox, Cadillac.) Repairs, supplies.

Dorsch, H. S.—1030 Albany St.

Ryan, P. F.—9-10 Central Arcade.

Vrooman Bros.—1259 State St. (Waltham, Elmore.) Repairing.

Vrooman, C. Stuart V.—8 Yates St. (Haynes.)

Parts and Accessories Manufacturers.

General Electric Co. Charging apparatus, Mercury arc rectifiers, motor generators.

Mohawk Electric Co.—1554 Union St. Wire terminals.

Repairing, Automobile.

Close Bros.—405 Smith St. (Knox, Cadillac.) Supplies, garage.

Vrooman Bros.—1259 State St. (Elmore, Waltham.) Garage.

Supplies, Automobile.

Close Bros.—405 Smith St. (Knox, Cadillac.) Garage, repairs.

SCHROON LAKE—

Automobile Agents and Dealers.

Bailey, Fred. F. (Waltham.)

NEW YORK (Continued)

SEA GATE—

Garages.

Sea Gate Garage.

SENECA FALLS—

Automobile Manufacturers, Gasolene.
Iroquois Motor Car Co.

Garages.

Davis & Co., E. C.—155 Falls St.

Parts and Accessories Manufacturers.
Romsey & Co. Fuel air pumps.

SHERBURNE—

Garages.

Fairchild, Frank.

SIDNEY—

Garages.

Phelps, H. J.

SMITHTOWN—

Garages.

Holm, John S.

SOMERS—

Automobile Agents and Dealers.
Wright, Geo. M. (Aerocar.)

SOUTHAMPTON—

Garages.

Squires, H. G.

SOUTHOLD—

Automobile Agents and Dealers.

Overton, L. W.—Traveler St. (Waltham.)

SPRINGVILLE—

Parts and Accessories Manufacturers.
Auto Pump Co. Pump tire inflators, tank gauges.

Repairing, Automobile.

Prinz & Schneider.

STAMFORD—

Garages.

Dyckman's Garage.—Harper St.

STANFORDVILLE—

Garages.

Wheeler, B.

STATESVILLE—

Automobile Agents and Dealers.

Steele, C. M. (Waltham.)

SUFFERN—

Automobile Agents and Dealers.

Slavin, Wm. (Maxwell.)

Vanderbilt, H. M. (Haynes.)

SYRACUSE—

Clubs and Associations.

Automobile Club of Syracuse.—Forman Wilkinson, Sec., 701 S. A. and K. Bldg.

Automobile Agents and Dealers.

Chase Motor Truck Co.—230 E. Water St. (Ford, Atlas, Stoddard-Dayton.)

Cronin Automobile Co.—569 S. Clinton St. (Premier, Dragon, Reo.)

Harrison Garage, The.—310 Harrison St. (Dolson, Northern.)

Kerr, M. W.—301 Dillaye Bldg. (Buick.)

NEW YORK (Continued)

Onondaga Garage.—54 S. Clinton St. (Pope-Hartford.)

Pierce Automobile Co., Amos.—109 S. State St. (Oldsmobile, Stevens-Duryea, Peerless.) Repairing.

Rambler Auto Co.—101 Fulton St. (Rambler.)

Reilly, C. J. (Waltham.)

Snow, B. W.—132 Bissell St. Mufflers, stampings.

Syracuse Auto Supply Co.—118-120 S. State St. (Maxwell.)

Syracuse Motor Car Co., The.—511 S. Clinton St. (Winton, Cadillac.)

Warner, G. E.—438 S. Salina St. (Thomas Flyer.)

Automobile Manufacturers, Gasolene. Franklin Mfg. Co., H. H.

Automobile Manufacturers, Gasolene Commercial.

Chase Motor Truck Co.—232 E. Water St.

Garages.

Breads, F. A.—328 E. Water St.

Doubleday Co., W. A.—349 S. Warren St.

Franklin Mfg. Co., H. H.—712 Gifford St.

Morrison Bros.—310 Harrison St.

Olmstead & Son., H. R.—413 S. Clinton St. Supplies.

Yorton, J. H.—413 S. State St.

Motorboat Manufacturers.

Leighton, H. J.

Motorcycle Agents and Dealers.

Olmstead & Son, H. R.—413 S. Clinton St. (Indian.)

Parts and Accessories Manufacturers.

Barber Bros.—101 Grape St. Gasolene and automobile motors.

Brennan Mfg. Co. Vaporizers.

Brennan Motor Co. Gasolene automobile motors, gasolene marine motors, circulating pumps.

Brown, Henry W.—517-521 E. Water St. Cylinder compression meters.

Brown-Lipe Gear Co.—208 S. Geddes St. Gears, transmission.

Crouse-Hinds Co.—W. Jefferson St. Timers and distributors.

Frazer & Jones Co. Malleable iron castings, steel castings.

Globe Malleable Iron Co.—Greenway Ave. Malleable iron castings.

Lefevre Arms Co. Chains.

Leighton, H. J.—901 Lafayette St. Marine motors.

New Process Rawhide Co. Gears.

Noxon, C. Per Lee.—500 E. Water St. Spark coil.

Oberdofer Brass Co., M. L.—804 Water St. Aluminum, brass, bronze, aluminum and copper castings.

NEW YORK (Continued)

Olmsted & Son, H. R.—413 S. Clinton St. Automobile tires, lockers.

Palmer-Moore Co. Automobile motors.

Picrome Hide Co.—1417 N. Salina St. Rawhide gear wheels, leather washers.

S. E. C. Co. Ammeters, voltmeters.

Standard Gauge Mfg. Co.—Industrial Bldg. Pressure gauges, waterline gauges, lubricators, stampings, safety valves.

Syracuse Aluminum & Bronze Co.—530 Leavenworth Ave. Bronze, bronze castings.

Syracuse Auto Supply Co.—118-120 State St. Storage batteries.

Syracuse & Eldredge Gloves Co.—924 S. Salina St. Gloves.

Syracuse Gear Co. Transmission gears.

Syracuse Malleable Iron Works. Malleable iron castings.

Syracuse Rawhide Mfg. Co.—Niagara and Shonnard Sts. Rawhide gear wheels.

Syracuse Rubber Co.—214 Clinton St. Morgan & Wright tires.

Syracuse Wrench Co.—Franklin and Water Sts. Wrenches.

Williams, E. Q.—533 S. Clinton St. Spark coil, spark plugs, electric switches.

Repairing, Automobile.

Pierce Auto Co., Amos.—109 S. State St. (Oldsmobile, Stevens-Duryea, Peerless.)

Supplies, Automobile.

Olmsted & Son, H. R.—413 S. Clinton St. Garage.

Vulcanizing.

Syracuse Rubber Co.—212 S. Clinton St.

TARRYTOWN—

Clubs and Associations.

Westchester Motor Club.—A. B. Barkman, Sec.

Automobile Agents and Dealers.

Koenig Bros.—Broadway, bet. Central Ave. and Main St. (Premier, Reo.) Supplies, garage, repairs.

Automobile Manufacturers, Gasolene. Maxwell-Briscoe Motor Co.

Automobile Manufacturers, Gasolene Commercial.

Maxwell-Briscoe Motor Co.

Garages.

Koenig Bros.—Broadway, bet. Central Ave. and Main St. (Premier, Reo.) Repairing, supplies.

Motorboat Manufacturers.

Petersen, Julius.

NEW YORK (Continued)

Repairing, Automobile.

Koenig Bros.—Broadway, bet. Central Ave. and Main St. (Premier, Reo.)
Garage, supplies.

Supplies, Automobile.

Koenig Bros.—Broadway, bet. Central Ave. and Main St. (Premier, Reo.)
Garage, repairs.

TIVOLI—

Automobile Agents and Dealers.

Havens, Beckwith. (Waltham.)

TOMPKINSVILLE—

Garages.

Killian's Garage.

TONAWANDA—

Automobile Agents and Dealers.

Echo Co., The.—Cor. Delaware and Young Sts. (Waltham.)

Garages.

Jones, E. E.—11 Tremont St.

Parts and Accessories Manufacturers.

Adamite Abrasive Co.—Schenck St.
Emery wheels.

Buffalo Bolt Co.—East Ave. and Oliver St. Bolts and nuts.

Buffalo Steel Co.—Fillmore Ave. Steel.

Echo Company.—Young and Delaware Sts. Gasolene marine motors.

Feine, August.—152 Terrace St. Bolts and rods.

Niagara Motor Boat Co.—Sweeney St. Boats.

Rose, Edw. I.—Fillmore St. Boats.

Tona Iron & Steel Co., Ironton St.
Iron and steel sheet and bar.

**TOTTENVILLE, STATEN ISLAND—
Motorboat Manufacturers.**

Acker, H.

TROY—

Clubs and Associations.

Automobile Club of Troy.—Dr. Archibald Buchanan, Sec.

Automobile Agents and Dealers.

Acme Auto Co.—310 Liberty St. (Mora.)

Albany Garage Co. (Peerless, Thomas, Matheson, Isotta Fraschini, Stevens-Duryea.) Supplies, garage, repairing.

Burdick, John.—485 River St. (National.)

Lucey Motor Car Co.—231-233 River St. (Stoddard-Dayton.) Garage.

Nichols, Scott D.—Federal and Front Sts. (Ford, Premier, Maxwell, Rambler.)

Trojan Button Fastener Co.—594 River St. (Queen, Gale.)

Troy Automobile Exchange.—22 4th St. (Pierce Arrow, Pope-Toledo, Franklin, Buick.)

Troy Carriage Wks.—5th Ave. and Federal St. and 745 3d Ave. (Wayne, Mitchell, Chadwick, Frayer-Miller, Baker.) Repairing.

White Co., The.—417 Federal St. (White.)

NEW YORK (Continued)

Garages.

Albany Garage Co. (Peerless, Thomas, Matheson, Isotta Fraschini, Stevens-Duryea.) Supplies, repairing.

Brewer, W. W.—2787 6th Ave.

Brunell, E. H.—359 Fulton St.

Kavanaugh, Fred. W.

Lucey Motor Car Co.—231-233 River St. (Stoddard-Dayton.)

Parts and Accessories Manufacturers.

Covert Mfg. Co. Screw jacks.

Grant-Ferris Co. Automobile motors.

Knowlson & M'Conihe.—65 River St.
Waterline gauges.

Troy Spring Works.—394-396 Congress St. Leaf springs.

Publications.

Carriage Dealers Journal.

Repairing, Automobile.

Albany Garage Co. (Peerless, Thomas, Matheson, Isotta Fraschini, Stevens-Duryea.) Supplies, garage.

Troy Carriage Wks.—5th Ave. and Federal St. and 745 3d Ave. (Wayne, Mitchell, Chadwick, Frayer-Miller, Baker.)

Supplies, Automobile.

Albany Garage Co. (Peerless, Thomas, Matheson, Isotta, Stevens-Duryea.)
Garage, repairing.

TRUMANSBURG—

Parts and Accessories Manufacturers.

Morse Chain Co. Chains.

TUXEDO PARK—

Automobile Agents and Dealers.

Weygant, W. M. (Maxwell, Mitchell.)

UTICA—

Clubs and Associations.

Automobile Club of Utica.—Robt. M. Hunt, Sec., 4 Lansing St.

Automobile Agents and Dealers.

Childs & Co., Chas. H.—Salesrooms and offices, 12-18 Lafayette St.; garage, cor. Cooper and Cornelia Sts. (Packard, Franklin, Pope-Waverley, Pope-Hartford, White, Autocar.)
Fitchard & Co., H. T.—9 Columbus St. (Maxwell.)

New York Auto Co.—126-130 Lafayette St., cor. State St. (Reo, Ford, Aerocar.) Garage, repairing.

Prichard, Percy. (Maxwell.)

Utica Cycle Co.—21 Columbia St. (Rambler.)

Utica Motor Car Co.—333-335-337 Bleeker St. (Buick, Peerless, Pierce Arrow, Thomas Flyer, Baker, Cadillac, Darracq.) Supplies, garage, repairs.

Garages.

Childs & Co., Chas. H.—Garage, cor. Cooper and Cornelia Sts.; salesrooms and offices, 12-18 Lafayette St. (Packard, Franklin, Autocar, White, Pope-Waverley, Pope-Hartford.)

NEW YORK (Continued)

Cronk; E. B. & A. F.—7 Liberty St.
 Mallison, J. M.—62 John St.
 New York Auto Co.—126-130 Lafayette St., cor. State St. (Reo, Ford, Aerocar.) Repairing.
 Utica Motor Car Co.—333-335-337 Bleecker St. (Buick, Peerless, Pierce Arrow, Thomas Flyer, Baker, Cadillac, Darracq.) Repairs, supplies.
Parts and Accessories Manufacturers.
 Blasier, M. E. Mfg. Co.—65 Columbia St. Automobile tops, glass wind shields.
 Childs Co., O. J.—48-50 Liberty St. Fire extinguishers.
 Clarke, E. P.—Arcade. Gasolene strainers.
 Eureka Mower Co. Jacks.
 Jones, John E.—173 South St. Wood wheels.
 Mott Wheel Works.—Pleasant St. Wire wheels.
 Powell Muffler & Timer Co.—44 Lafayette St. Timers, muffler cut-out valves.
 Smith & Co., D. B. Mufflers, cutout muffler valves.
 Utica Foundry Co. Gray iron castings.
 Utica Drop Forge & Tool Co. Nippers and pliers.
 Utica Steam Engine & Boiler Works. Gray iron castings.
 United States Emergency Case Co. Medical emergency cases.
 Willoughby Co.—86 Genesee St. Wood and metallic bodies.
 Xardell Co., C. A. Carbureters, automobile motors.
 Yankee Muffler Co., The. Mufflers.
Repairing, Automobile.
 New York Auto Co.—126-130 Lafayette St., cor. State St. (Reo, Ford, Aerocar.) Repairing.
 Utica Motor Car Co.—333-335-337 Bleecker St. (Buick, Peerless, Pierce Arrow, Thomas Flyer, Baker, Cadillac, Darracq.) Supplies, garage.
Supplies, Automobile.
 Utica Motor Car Co.—333-335-337 Bleecker St. (Buick, Peerless, Pierce Arrow, Thomas Flyer, Baker, Cadillac, Darracq.) Garage, repairs.

UNIONVILLE—

Automobile Agents and Dealers.
 Tuthill, R. S. (Holsman.)

WAINSCOTT—

Automobile Agents and Dealers.
 Strait & Son, J. G. (Reo.)
Garages.

Hedges, W. H.

WARSAW—

Automobile Agents and Dealers.
 Warsaw Auto Garage & Machine Wks. (Winton, Cadillac, Autocar.)
 Williams, C. D. (Waltham.)

NEW YORK (Continued)

WARWICK—

Automobile Agents and Dealers.
 Wood, Jesse. (Cadillac.)
Garages.
 Sanford, Edw. B.

WASHINGTONVILLE—

Garages.
 Fulton, Thomas.

WATERLOO—

Automobile Agents and Dealers.
 Waterloo Automobile Co. (Buick, Marmon.)
Parts and Accessories Manufacturers.
 Waterloo Woolen Mfg. Co. Cloth and carpet trimmings.

WATERTOWN—

Clubs and Associations.
 Watertown Automobile Club.—I. G. De Cant, Pres.
Automobile Agents and Dealers.
 De Cant.—3 Lansing Block. (Northern.)
 Gray, Chauncey W.—5 Taggart Block. (Franklin.)
 Harbottle Co. (Waltham.)
 Howard Co., F. H.—56 Galen St. (Glide.)
 Taggart, B. B. (White.)
 McCartin, Geo. S. T. (Thomas.)
 Riordan & Riggs. (Cadillac.)
 Watertown Auto & Supply Co. (Matheson.)

Garages.

Greene, Will C.—91 Washington St.
Motorboat Manufacturers.
 Watertown Motor Co.
Parts and Accessories Manufacturers.
 Babcock Co., H. H.—Factory Square. Automobile bodies.
 Massey Machine Co.—Pearl St. Castings, gray iron castings.
 Waterman Motor Co.—40 Moulton St. Marine motors.
 Watertown Motor Co.—40 Moulton St. Marine motors.

WATERVILLE—

Garages.
 Waterville Market Co.—White St.

WATERVLIET—

Parts and Accessories Manufacturers.
 Roy & Co., James. Cloth and carpet trimmings.

WAVERLY—

Garages.
 Miller, L. C.—227 Broad St.

WELLSVILLE—

Automobile Agents and Dealers.
 Brown & Scott Co. (Ford, National.)

WESTBURY, LONG ISLAND—

Garages.
 Maltby, D. F.

WESTHAMPTON BEACH—

Automobile Agents and Dealers.
 Graphic Cycle & Auto Wks. (Cadillac, Oldsmobile, Reo.)

NEW YORK (Continued)

WEST NEW BRIGHTON, S. I.—

Automobile Agents and Dealers.

Cornell, W. W. (Maxwell.)

WHITE PLAINS—

Automobile Agents and Dealers.

Ennis & Gavin.—14 Martin Ave. (Reo.)

Horton, E. P.—2-4 Mamaroneck Ave. (Maxwell.)

Logan, Co., Ernest. (Maxwell.)

Garages.

Hessel's Garage, E. S.—15 Brookfield St. Supplies.

Mammoth Garage Co.—Mamaroneck Ave. and Post Rd.

White Plains Garage.—2-4 Mamaroneck Ave. Supplies.

Supplies, Automobile.

Hessel's Garage, E. S.—15 Brookfield St. Garage.

White Plains Garage.—2-4 Mamaroneck Ave. Garage.

WOLCOTT—

Automobile Agents and Dealers.

Reo Automobile Co.—Main St. (Reo, Premier.)

WOODMERE—

Garages.

Higgins, C. C.

YONKERS—

Clubs and Associations.

Yonkers Automobile Club.

Automobile Agents and Dealers.

Mann, W. F. (Waltham.)

Shrive, William.—64 Warburton Ave. (Cadillac.)

Yonkers Auto Station.—71 S. Broadway. (Locomobile, Maxwell.) Repairs, garage.

Automobile Manufacturers, Gasolene.

Colt Runabout Co.—52 Broadway.

Garages.

Eickemeyer & Osterheld.—5 Napperhan St.

Yonkers Auto Station.—71 S. Broadway. (Locomobile, Maxwell.) Repairs.

Motorboat Manufacturers.

Gere Launch & Engine Works.

Parts and Accessories Manufacturers.

Van Auken Cleavage Co. Gasolene automobile motors.

Willyoung Appliance Co. Ignition coils, magnetos, spark plugs, tire chain grips, shock absorbers, accessories.

Repairing, Automobile.

Yonkers Auto Station.—71 S. Broadway. (Locomobile, Maxwell.) Garage.

NORTH CAROLINA

ASHEVILLE—

Automobile Agents and Dealers.

Asheville Cycle & Auto Co.—15 Lexington Ave. (Cadillac, Knox.)

NORTH CAROLINA (Continued)

Southern Auto Co.—College St. (Rambler, Ford.)

Garages.

Modern Auto Co.—College St.

Parts and Accessories Manufacturers.

Asheville Mica Co. Mica washers.

BURLINGTON—

Automobile Agents and Dealers.

Holt, Eugene. (Maxwell.)

CHARLOTTE—

Automobile Agents and Dealers.

Barringer Co., Ormond L.—20 W. Trade St. (Franklin, Autocar, Cadillac, Baker, Pope-Waverley.)

Garage, repairing.

Burwell, A., Jr.—7 W. 5th St. (Rambler.)

Ham & Ross.—23 S. College St. (Maxwell-Briscoe.) Garage, repairing.

Hamilton, J. H. (Pope-Hartford.)

Painter, G. W. (Buick.)

Garages.

Barringer Co., Ormond L.—20 W. Trade St. (Franklin, Autocar, Cadillac, Baker, Pope-Waverley.)

Repairing.

Ham & Ross.—23 S. College St. (Maxwell-Briscoe.) Repairing.

Repairing, Automobile.

Barringer Co., Ormond L.—20 W. Trade St. (Franklin, Autocar, Cadillac, Baker, Pope-Waverley.)

Garage.

Ham & Ross.—23 S. College St. (Maxwell-Briscoe.) Garage.

CONCORD—

Automobile Agents and Dealers.

Rogers, F. O. (Maxwell.)

DURHAM—

Automobile Agents and Dealers.

Lyon, Geo. L.—Main and Chapel Hill Sts. (Reo, Premier.)

FAYETTEVILLE—

Automobile Agents and Dealers.

Percival, E. W., Jr. (Waltham.)

FRANKLIN—

Parts and Accessories Manufacturers.

Carolina Locust Pin & Mica Co. Mica.

GREENSBORO—

Automobile Agents and Dealers.

Rosenblatt, J. M. (Jackson.)

PINETOWN—

Parts and Accessories Manufacturers.

Parker, Surry. Gasolene engines, steam boilers, gears, iron and brass castings, forgings.

Repairing, Automobile.

Parker, Surry.

PLUMTREE—

Parts and Accessories Manufacturers.

Vance, D. T. Mica, mica washers.

ROANOKE RAPIDS—

Automobile Agents and Dealers.

Treacy & Pierce. (Waltham.)

NORTH CAROLINA (Continued)

ROWLAND—

Automobile Agents and Dealers.
McCormac, P. A. (Waltham.)
McLeod, A. J. (Cadillac.)
Repairing, Automobile.
Braswell, O. E.

SALISBURY—

Automobile Agents and Dealers.
Wallace & Sons, V. (Pope-Hartford.)

STOVAL—

Automobile Agents and Dealers.
Dickerson, E. N. (Waltham.)

TAYLORSVILLE—

Automobile Agents and Dealers.
Everhart, N. C. (Maxwell.)

WASHINGTON—

Automobile Agents and Dealers.
Havens, John. (Cadillac.)

WILMINGTON—

Automobile Agents and Dealers.
Herbst, F.—110 S. Second St. (Maxwell.)

WILSON—

Automobile Agents and Dealers.
Eason Auto Co. (Cadillac.)
Hales, J. C. (Ford.)

WINSTON—

Automobile Agents and Dealers.
Painter, G. W. (Buick.)

WINSTON-SALEM—

Automobile Agents and Dealers.
Hedge Co., Oscar F.—317 Maine St. (Cadillac.) **Garage, repairing.**
Garages.
Hedge Co., Oscar F.—317 Maine St. (Cadillac.) **Repairing.**
Repairing, Automobile.
Hedge Co., Oscar F.—317 Maine St. (Cadillac.) **Garage.**

WORTH—

Automobile Agents and Dealers.
Earl & Carpenter. (Maxwell.)

NORTH DAKOTA

BISMARCK—

Automobile Agents and Dealers.
Henzler, C. W. (Buick.)

BOTTINEAU—

Automobile Agents and Dealers.
Hofacker, A. W. (Waltham.)
Lundy-Fulton Auto Co. (Ford, Mitchell, Cameron.)

CARRINGTON—

Automobile Agents and Dealers.
Carrington Auto Co. (Dragon.)

CATHAY—

Automobile Agents and Dealers.
Cathay Hdw. & Imp. Co. (Waltham.)

COOPERSTOWN—

Automobile Agents and Dealers.
King-Platt Auto Co. (Rambler, Reo, Queen.)
Rhoda, A. (Mitchell.)

NORTH DAKOTA (Continued)

DEVILS LAKE—

Automobile Agents and Dealers.
Moody, C. F. (Buick.)

DICKINSON—

Automobile Agents and Dealers.
Davis, Dr. H. A. (Buick.)

ENDERLIN—

Automobile Agents and Dealers.
Gerrish, W. A.—First Ave. and Railway St. (Mitchell.)

FARGO—

Automobile Agents and Dealers.
Lynch Co., Frank. (Cadillac, Pope-Waverley.)
Garages.
Fargo Auto Brokerage & Garage Co.—302 Broadway.

GLENULLIN—

Automobile Agents and Dealers.
Western Realty & Loan Co. (Buick.)

GRAND FORKS—

Automobile Agents and Dealers.
Houghton Implement Co.—201-225 N. 9th St. (Jackson, Gale.)
Lyons & Co. (Franklin, Cadillac.)
Shillinglaw, H. L.—20 N. 4th St. (Mitchell.)

Motorcycle Agents and Dealers.
Lyons & Co. (Indian.)

HARVEY—

Automobile Agents and Dealers.
Renfrew, S. S. (Buick.)

INKSTER—

Automobile Agents and Dealers.
Sims & Co., H. W. (Buick.)

JAMESTOWN—

Automobile Agents and Dealers.
Ford, H. N. (Dolson.)
Lenzland & Loan Co. (Buick.)
Seiler Co., The. (Cadillac.)

KENMARE—

Automobile Agents and Dealers.
England, J. A. (Buick.)

LAKOTA—

Automobile Agents and Dealers.
Ware & Floren. (Reo, Premier.)

MAYVILLE—

Automobile Agents and Dealers.
Horton & Co. (Cadillac.)
Spuringer & Eastrold. (Ford.)

MINOT—

Automobile Agents and Dealers.
Lorge & Welch (Cadillac.)
Tasher, B. B. (Ford.)
Garages.
Minot Machine Supply Co.

PARK RIVER—

Garages.
McEwan & Dougherty.

PINGREE—

Automobile Agents and Dealers.
Jarvis, Levi. (Jewel.) **Repairing.**
Repairing, Automobile.
Jarvis, Levi. (Jewel.)

NORTH DAKOTA (Continued)

PORTLAND—

Garages.

Kern & Son.

REDFIELD—

Automobile Agents and Dealers.

Norbeck & Nicholson. (Maxwell.)

ROLLA—

Garages.

Duncan, W. A.

RUGBY—

Automobile Agents and Dealers.

McBride, Dr. (Mitchell.)

Scott, A. J. (Northern.)

VALLEY CITY—

Garages.

Butrey, James.

McDonald, Hugh.

Westergard, Wm. J.

WAHPETON—

Automobile Agents and Dealers.

Horton & Co. (Cadillac.)

WIMBLEDON—

Automobile Agents and Dealers.

More Bros. (Lambert.)

OHIO

AKRON—

Clubs and Associations.

Akron Automobile Club.—Dr. F. W. W. Work.

Ohio Automobile Club.

Automobile Agents and Dealers.

Akron Auto Garage Co.—9 W. Buchtel Ave. (Franklin, Winton.)

Akron Automobile Garage.—Cor. Main and Cedar Sts. (Franklin, Winton.) Garage, repairs, supplies.

Camp, L. W. (Haynes.)

Central Motor Car Co. (Maxwell, Pope-Hartford, Pope-Waverley.)

Central Motor Car Co.—150 S. Howard St. (Pope.)

Club Garage.—729 S. Main St. (Lambert, Queen, Glide, Plymouth.)

Goodyear Rubber & Tire Co. (Rapid.) Lata, L. M. (Jewel.)

Rhinehard, A. B. (White.)

Ross, A. H.—Flatiron Bldg., Main St. (Reo.)

Ruede, F. S. (Dolson.)

Sander & Co., J. M. (Cartercar.)

Smith & Lander. (Premier, Rambler.)

Summit Automobile Co. (Cartercar.)

Union Auto Garage Co.—35 S. College St. (Buick, Pope-Toledo, Thomas Flyer.)

Weaver, J. C.—720 S. Main St. (Queen.)

Automobile Manufacturers, Gasolene. International Harvester Co.

Garages.

Akron Automobile Garage.—Cor. Main and Cedar Sts. (Franklin, Winton.)

Repairs, supplies.

OHIO (Continued)

Standard Auto Garage Co.—257-259 E. Market St.

Stein, Charles.

Williams Motor Car Co.

Parts and Accessories Manufacturers.

Akron Mfg. Co.—927 S. High St. Oil cans, tire treads.

Akron Pneumatic Tire & Protector Co. Non-skids, tire shoes, tire sleeves.

Collins & Son, G. A. Automobile tops.

Consolidated Rubber Tire Co.—Cook and 3d Aves. Tires.

Diamond Rubber Co. Rubber tires, mechanical rubber goods.

Diamond Tire Co. Hard rubber steering wheels.

Firestone Tire & Rubber Co.—Miller St. and Sweitzer Ave. Solid and pneumatic tires.

Frantz Body Co., The.—Stanton Ave. and Getz St. Automobile bodies and seats.

Freer Gauge Co.—Everett Bldg. Gasolene tank gauges.

Goodrich Co., B. F., The. Collapsible buckets, rubber mats, tire valve pump connections, tire repair kits, tire plugs, tire tools, pneumatic tires and solid tires.

Goodyear Tire & Rubber Co. Automobile tires, universal rims, motor cycle tires.

Independent Tire & Rubber Co. Pneumatic tires.

Long Wrench Co., J. R., The. Wrenches.

Lyon Rubber Co. Tire cement.

M. & M. Mfg. Co. Tire cement, tire patches, tire treads.

Motz Clincher Tire & Rubber Co. Solid and cushion tires.

Stein Double Cushion Tire Co. Solid tires.

Swinehart Clincher Tire & Rubber Co. Solid tires, pneumatic tires.

Whitman & Barnes Mfg. Co. Drop forgings, wrenches, tools.

Publications.

India Rubber Review.

Repairing, Automobile.

Akron Automobile Garage.—Cor. Main and Cedar Sts. (Franklin, Winton.) Garage, supplies.

Crowley, G. G.—1319 E. Market St.

Mahonning Motor Repair Co.—26-28 Warren Ave.

Supplies, Automobile.

Akron Automobile Garage.—Cor. Main and Cedar Sts. (Franklin, Winton.) Garage, repairs.

Vulcanizing.

Akron Pneumatic Tire & Protector Co.

OHIO (Continued)

ALLIANCE—

Automobile Agents and Dealers.

Alliance Motor Car Co.—Court St. (Jackson.)

Stark Summitt Auto Co.—512 S. Arch Ave. (Mitchell, Cartercar, Ford, Marvel.) Garage, repairing.

Tollerton, I. G. (Jewel.)

Wilson & Ellett Motor Car Co., The. (Cadillac, Winton.)

Garages.

Central Auto Co.

Stark Summitt Auto Co.—512 S. Arch Ave. (Mitchell, Cartercar, Ford, Marvel.) Repairing.

Parts and Accessories Manufacturers.

Trasnoe & Williams Co., The. Drop forgings.

Repairing, Automobile.

Stark Summitt Auto Co.—512 S. Arch Ave. (Mitchell, Cartercar, Ford, Marvel.) Garage.

ASHLAND—

Automobile Agents and Dealers.

Fouche, Ira.—E. 4th St. (Cameron.)
Mansfield Auto & Supply Co. (Cadillac.)

Overs, C. E.—2d St. (Ford, Mitchell.)

Richards, J. B.—2d St. (Ford, Jackson.)

Safety Door Hanger. (Mitchell.)

Garages.

Hunter, F. S.

Supplies, Automobile.

Elite Mfg. Co. Automobile supplies.

ASHTABULA—

Automobile Agents and Dealers.

McGiffert, James. (Reo.)

Reedenbach, R. P. (Jackson.)

Scriven's New Garage. C. L.—13 Spring St. (Buick, Cadillac.) Garage, repairing.

Garages.

Auto Shop.—85½ Park St.

Scriven's New Garage, C. L.—13 Spring St. (Buick, Cadillac.) Repairing.

Parts and Accessories Manufacturers.

Ashtabula Carriage Bow Co.—99 Prospect St. Bow sockets.

Ashtabula Hide and Leather Co. Leather.

Raser Tanning Co. Leather.

Repairing, Automobile.

Scriven's New Garage, C. L.—13 Spring St. (Buick, Cadillac.) Garage.

BARNESVILLE—

Automobile Agents and Dealers.

Dounda, J. W. (Mitchell.)

BELLEFONTAINE—

Automobile Agents and Dealers.

Martin, C. F. (Northern, Cadillac.)

White Co., The.—19 E. 9th St. (White.)

OHIO (Continued)

Garages.

Patterson, Wm. T.

Parts and Accessories Manufacturers.

Miller & Co., A. J. Bodies, seats.

Ohio Carriage Body Co. Wood and metallic bodies.

Automobile Manufacturers, Gasolene.

Bellefontaine Auto Co.

Zent Auto Co.

BELLEVUE—

Automobile Agents and Dealers.

Duerr, J. J.—122-124 Northwest St. (Jackson.) Repairing, garage.

Garages.

Duerr, J. J.—122-124 Northwest St. (Jackson.) Repairing.

Repairing, Automobile.

Duerr, J. J.—122-124 Northwest St. (Jackson.) Garage.

BLUFFTON—

Parts and Accessories Manufacturers.

Pocket Meter Co. Ammeters, voltmeters.

BUCYRUS—

Automobile Agents and Dealers.

Bucyrus Cycle & Auto Co. (Maxwell, Rambler, Pope-Waverley, Mitchell.)

Crawford Auto Agency. (Winton.)

Rosena Bros. (Reo.)

Garages.

Eberhart & Son.

CAMBRIDGE—

Automobile Agents and Dealers.

Siegfried, J. B. (Jewel.)

Garages.

Fritz, J. S. Repairing.

Repairing, Automobile.

Fritz, J. S. Garage.

CANAL DOVER—

Automobile Agents and Dealers.

Miller, E. H. (Jewel.)

CANTON—

Automobile Agents and Dealers.

Automobile Transit & Repair Co.—E. 5th St., nr. Cleveland Ave. (Jackson.)

Culp, T. S.—627 Mahoning St. (Gale, Wayne, Second-hand cars.) Garage, repairing.

Diebold Auto Co. (Thomas Flyer.)

Diebold Motor Car Co.—Cor. 5th and McKinley Sts. (Buick, Franklin.)

Dunlap Motor Car Co. (Mitchell.)

Monnot & Sacher, Salesroom & Garage.—305 S. Market St. (Rambler.) Garage, repairing.

Rubright, A.—2d and Market Sts. (Reo, Premier.)

Wilson, A. H.—2d and Market Sts. (Cadillac, Winton, Northern.)

Garages.

Culp, T. S.—627 Mahoning St. (Gale, Wayne, Second-hand cars.) Repairing.

OHIO (Continued)

Monnot & Sacher, Salesroom & Garage.—305 S. Market St. (Rambler.) Repairing.

Parts and Accessories Manufacturers.
Cleveland-Canton Spring Co., The. Leaf springs.

Hedglend Mfg. Co. Differential gears.
Timken Roller Bearing Axle Co. Roller bearings and axles, steering apparatus.

Repairing, Automobile.

Culp, T. S.—627 Mahoning St. (Gale, Wayne, Second-hand cars.) Garage.

Monnot & Sacher, Salesroom & Garage.—305 S. Market St. (Rambler.) Garage.

CHILLICOTHE—

Automobile Manufacturers, Gasolene.
Logan Construction Co.

Automobile Manufacturers, Gasolene Commercial.

Logan Construction Co.

Garages.

Houser, Orville.—101 N. Mulberry St. Logan Construction Co.

Parts and Accessories Manufacturers.
Deschler, August.—1820 E. Water St. Axles, hubs, gasolene automobile motors.

CINCINNATI—

Clubs and Associations.

Automobile Club of Cincinnati.—L. S. Colter, Sec., 3410 Clifton Ave.

Automobile Agents and Dealers.

Aerocar Co., The.—707 Broadway. (Mora, Reo.)

Auto Livery & Repair Co.—707 Broadway. (Aerocar.)

Auto-Motor Car Co.—804 Sycamore St. (Berliet, Rainier, Welch, Stoddard-Dayton, Baker, Rapid Delivery wagons, Couplegear electric trucks.) Garage, repairs.

Buckeye Automobile Co.—441 Bank St. (Monarch, Cameron.)

Cincinnati Automobile Co.—215-217 E. 5th St. (Pope-Toledo, Pope-Hartford, Peerless.) Garage, repairs, supplies.

Cincinnati Motor Vehicle Co.—117-121 Opera Pl. (Pope-Waverley, Marmion, Gasolene touring cars.) Garage, repairing.

Citizens' Motor Car Co.—N. E. Cor. 7th and Main Sts. (Packard, Pierce, Cadillac, Columbus.) Garage, repairing.

Coldewey, W. G. (Frayer-Miller.)

Crowthers, Robert C.—117 E. 7th St. (Elmore, Marion.)

De Luxe Motor Sales Co.—216 E. 3d St. (De Luxe.)

Gunther Bros.—1633 Madison Rd. (Royal.)

OHIO (Continued)

Gustin Auto Co.—1309 Sycamore St. (Lambert.)

Hanauer Automobile Co.—118 E. 7th St. (Locomobile, Winton.)

Hooker, Stanley A.—217 E. 3d St. (Maxwell, Pullman.)

Hughes Automobile Co.—816 Main St. (Stearns.)

Jungclass Auto Co.—Reading Road, Avondale. (Mitchell, Dragon, Dolson.)

Maguire & Co., T. D. (Cartercar.)

McGowan, J. Harry, c/r John H. McGowan Co. (Haynes.)

Miller Sons Carriage Co., Geo. C.—713 Main St. (Stevens-Duryea, Isotta.)

Queen City Auto Co.—538 W. McNicken Ave. (Knox, Waltham.)

Reliance Motor Co.—216 E. 3d St. (Maxwell.)

Sid Black Automobile Co.—630 Walnut St. (Lozier, Franklin, Babcock, Buick.) Garage, repairing, renting, supplies.

Special Motor Vehicle Co.—225 E. 4th St. (Ford.)

Suburban Auto & Garage Co.—2713-2717 Woodburn Ave. (Queen, Rauch & Lang.)

White Co., The.—19 E. 9th St. (White.)

Automobile Manufacturers, Gasolene.
Schact Mfg. Co., The.—2727 Spring Grove Ave.

Automobile Manufacturers, Gasolene Commercial.

Sayers & Scovill.—2247-2261 Colerain Ave.

Garages.

Auto-Motor Car Co.—804 Sycamore St. (Berliet, Rainier, Welch, Stoddard-Dayton, Baker, Rapid delivery wagons, Couplegear electric trucks.) Repairing.

Cincinnati Auto Co.—215-219 E. 5th St. (Pope-Toledo, Pope-Hartford, Peerless.) Repairing, supplies.

Cincinnati Motor Vehicle Co.—117-121 Opera Place. (Pope-Waverley, Marmion.) Repairing.

Citizens' Motor Car Co.—N. E. Cor. 7th and Main Sts. (Packard, Pierce, Cadillac, Columbus.) Repairing.

Sid Black Automobile Co.—630 Walnut St. (Lozier, Franklin, Babcock Buick.) Repairing, supplies, renting.

Standard Auto Co.—640 Main St.

Motorcycle Agents and Dealers.

Pickering Hardware Co. (Indian.)

Parts and Accessories Manufacturers.

American Oak Leather Co.—Kenner St. and Dalton Ave. Leather.

Bauer Bros.—937 W. 8th St. Auto tops.

Bullock Electric Mfg. Co. Charging apparatus, electric motors.

OHIO (Continued)

Buob & Scheu.—408 E. Court St. Wood and metallic bodies, tire cases, glass wind shields, auto tops.

Carlisle & Finch Co.—223 E. Clinton Ave. Magnetos and ignition dynamos, lamps.

Central Brass Works. Brass pipe fittings.

Cincinnati Electric Tool Co., The.—650-652 Evans St. Portable electric drills, grinders, blowers, flexible shafts, buffing and polishing lathes.

Cincinnati Milling Machine Co. Milling machines, cutters and tool grinders.

Clifton Motor Works.—265 E. Clifton Ave. Marine motors.

Consolidated Rubber Tire Co.—641 Main St. Tires.

Corcoran Lamp Co.—1712 Reading Road. Lamps.

Fewless-Lean Brass & Iron Co. Brass pipe fittings.

Fischer Special Mfg. Co.—2076-2078 Reading Road. Spark coils, spark plugs.

Goodyear Tire & Rubber Co.—317 E. 5th St. Tires.

Hisey Wolf Machine Co. Special automobile machinery.

Jergens Co., Andrew. Hand soaps.

Lunkenheimer Co., The. Lubricators, exhaust pressure regulators, oil and grease cups, primary cups, gasoline strainers, pumps, crank cases, valves.

Mendenhall, C. S.—Race St. and Opera Pl. Road maps.

Mitchell Co., P. R. Spring Grove and Harrison Aves. Curled hair.

Murdock, Co., James, Jr.—116 Opera Pl. License numbers, monograms, steel stamps and stencils, metal trimmings.

Obermayer Co., S.—641 Evans St. Crucibles, graphite.

Powell Co., William, The.—2525-2531 Spring Grove Ave. Pipe and brass fittings, grease cups, lubricators, throttle valves.

Queen City Brass & Iron Works. Brass pipe fittings.

Rock Island Battery Co. Dry cells.

Standard Caronic Co. Tank tire inflators.

Steptoe Shaper Co., John, The.—2961 Colerain Ave. Iron works, shapers.

Streit Machine Co.—1108-1110 Harrison Ave. Automobile motors.

United States Aluminum Castings Co. Aluminum, brass, bronze, aluminum and copper castings.

Von Wyck Machine Tool Co. Special automobile machinery.

OHIO (Continued)

Warner Pole & Top Co. Storm aprons and curtains, foot rests, tool bags, automobile tops.

Watkins Co., Frank M., The.—525 Baymiller St. Marine motors.

Williams Valve Co., D. T.—904-915 Broadway. Carbureters, brass, bronze, aluminum and copper castings, brass couplings, pipe and brass fittings, grease cups, lubricators, oil cups, oil pumps, gasoline strainers, safety valves, throttle valves.

Publications.

Gas Engine, The.—514 Main St.

Iron Moulder's Journal.

Renting, Automobile.

Sid Black Automobile Co.—630 Walnut St. (Franklin, Lozier, Babcock Buick.) Supplies, garage, repairing.

Repairing, Automobile.

Auto-Motor Car Co.—804 Sycamore St. (Berliet, Rainier, Welch, Stoddard-Dayton, Baker, Rapid Delivery wagons, Couplegear electric trucks.) Garage.

Cincinnati Auto Co.—215-219 E. 5th St. (Pope-Toledo, Pope-Hartford, Peerless.) Garage, supplies.

Cincinnati Motor Vehicle Co.—117-121 Opera Pl. (Pope-Waverley, Marmon, Gasolene touring cars.) Garage.

Citizens' Motor Car Co.—N. E. Cor. 7th and Main Sts. (Packard, Pierce, Cadillac, Columbus.) Garage.

Sid Black Automobile Co.—630 Walnut St. (Lozier, Franklin, Babcock Buick.) Garage, repairing, renting.

Supplies, Automobile.

Avondale Auto Supply Co.—Reading Road and Windham Ave. Jobbers and dealers, automobile supplies.

Cincinnati Auto Co.—215-219 E. 5th St. (Pope-Toledo, Pope-Hartford, Peerless.) Garage, repairing.

Sid Black Automobile Co.—630 Walnut St. (Lozier, Franklin, Babcock Buick.) Garage, supplies, renting.

CIRCLEVILLE—

Clubs and Associations.

Automobile Club of Circleville.

Automobile Agents and Dealers.

Hulse, H. S. (Maxwell.)

CLEVELAND—

Clubs and Associations.

Ohio State Automobile Association.

—The Hollenden Hotel.

Cleveland Automobile Club.—The Hollenden Hotel.

Cleveland Automobile Trade Ass'n.—The Hollenden Hotel.

Automobile Agents and Dealers.

Auto Shop Co., The.—731 Vincent Ave., N. E. (Thomas Flyer, Thomas Detroit, Franklin.) Garage, repairing.

Bailey Co., The. (Oldsmobile.)

OHIO—Cleveland (Continued)

Central Automobile Co.—2169 9th St.
(Matheson, Studebaker.)
Chisholm-Philips Automobile Co.—
5906-5908 Euclid Ave. (Stevens-
Duryea.) Garage, repairing.
Davis, W. B.—92 Ontario St. (Jewel.)
Drake, Francis E. (Napier.)
Euclid Garage, The.—Euclid Ave.
(Pungs-Finch, Compound.)
Ford Motor Co.—1913 Euclid Ave.
(Ford.)
Garford Motor Car Co., The. (Gar-
ford.)
Hall Bros.—1613 Euclid Ave. (Carter-
car, Reliance, Rapid, Climax.)
Hipp, J. C.—347 Euclid Ave. (Moline.)
Homes Booth Auto Co.—636 55th St.
(Pope-Hartford.)
Jewel Automobile Sales Agency.—
1375 Ontario St. (Jewel.)
Leonard Motor Car Co. (Jackson.)
Lucas & Christenson.—2002 Euclid
Ave. (Mitchell.) Garage.
Magoon Motor Co., R. H.—2174-2180
9th St., S. E. (Pope-Toledo.) Gar-
age, repairs, supplies.
Metropolitan Motor Car Co.—E. 19th
St. and Euclid Ave. (Stearns, Cad-
illac, Pierce Arrow.)
Moore, Harry S.—1761 Crawford Rd.
(Stoddard-Dayton.) Garage, repair-
ing.
Moore, J. G.—809 Euclid Ave. (Dol-
son.)
Ohio Motor Car Co.—2142 E. 9th St.
(Buick, Columbia, Waltham,
Haynes.)
Oldsmobile Co.—1010 Prospect Ave.
(Oldsmobile.)
Patterson, Geo. S.—254 Euclid Ave.
(Reo, Premier.)
Price Bros.—Huron St. (Baker.)
Reese, E. Shriver.—330 Euclid Ave.
(Columbus, Royal.)
Reid, S. D., Euclid Garage. (Dolson.)
Reo Motor Car Co.—1032 Euclid Ave.
(Reo, Premier.)
Royal Motor Car Co. (Royal.)
Schellentrager, E. J. (Matheson.)
Standard Auto Co.—1206 Huron Road.
(Packard.)
Stearns Co., F. B., The. (Stearns.)
Stevenson, Frank E. (Atlas.)
United Motor Car Co.—6912 Euclid
Ave. (Dragon.)
Wentworth Motor Car Co.—11406
11408 Euclid Ave. (Mora.)
Whitcomb Auto Co., T. C.—E. 9th St.
(Rambler.)
White Co., The.—407 Rockwell Ave.
(White.) Garage.
Winton Motor Car Co.—122 Huron
Rd. (Winton.)

OHIO—Cleveland (Continued)

Automobile Manufacturers, Electric.
Baker Motor Vehicle Co.—116 Jesse
St.
Parsons Elec. Motor Carriage Co.
Rauch & Lang Carriage Co., The.—406
Superior St.
**Automobile Manufacturers, Electric
Commercial.**
McCrea Motor Truck Co., The.—Am-
erican Trust Bldg.
Automobile Manufacturers, Gasolene.
Broc. Co., The.—1665-1667-1669 E. 40th
St.; 4021-4023 Payne Ave.
Cleveland Motor Car Co.
French American Motor Car Co.—40th
St. and Payne Ave.
Gaeth Automobile Co., Inc., The.—
2553 W. 25th St.
Peerless Motor Car Co., The.—Lis-
bon St.
Royal Motor Car Co.—Gordon Park
Blvd. and Lake Shore Tracks.
Stearns Co., F. B., The.—Euclid and
Lake View Aves.
Winton Motor Carriage Co., The.—
Berea Road.
**Automobile Manufacturers, Gasolene
Commercial.**
Gaeth Automobile Co., Inc., The.
Automobile Manufacturers, Steam.
White Co., The.—Rose Bldg.
**Automobile Manufacturers, Steam
Commercial.**
White Co., The.—Rose Bldg.
Garages.
Advance Automobile Co.—18 St. Clair
St.
Auto Equipment Co.—472 Euclid Ave.
Auto Express Delivery Co.—Erie
Court, S. E.
Auto Livery Co.—1375 Ontario St.
Auto Shop Co., The.—731 Vincent
Ave., N. E. (Thomas Flyer, Thom-
as Detroit, Franklin.) Repairing.
Brouse, W. E.—Browning Bldg.
Chisholm-Philips Automobile Co.—
5906-5908 Euclid Ave. (Stevens-
Duryea.) Repairing, supplies.
Citizens Transit Co., The.
Crane & Co., G. F.—40 Clara St.
Crawford & Soper.—1010 Prospect
Ave., S. E.
Euclid Auto Exchange & Livery.—
5017 Euclid Ave.
Lucas & Christenson.—2002 Euclid
Ave. (Mitchell.)
Magoon Motor Co., R. H.—2174-2180
9th St., S. E. (Pope-Toledo.) Re-
pairs, supplies.
Moore, Harry S.—1761 Crawford Road.
(Stoddard-Dayton.) Repairing.
Oliver Elec. Vehicle Co.—1737 12th St.
Reliable Auto Co.—1000 Bolivar Rd.
Rice, C. B.—941 8th Ave.
Rush, C. W.—2036 Euclid Ave.

OHIO—Cleveland (Continued)

Stamped Steel Engine Mfg. Co.—475 E. 105th St.

Motorcycle Agents and Dealers.

Mueller, L. J.—6417 Woodland Ave. (Indian, Merkel.)

***Parts and Accessories Manufacturers.**

Acme Foundry Co.—Sweeny St. Gray iron castings.

Aetna Brass Co.—4800 Hamilton Ave. Automobile hinges, threadles, brass, bronze and aluminum hoods.

Allyn Brass Foundry Co. Aluminum, bronze and brass castings.

American Ball Bearing Co.—Edgewater Park and L. S. & M. S. Ry. Axles, ball bearing hubs, ball bearings, ball thrust bearings.

American Machine & Mfg. Co., The. Machine work to order.

Atlas Bolt & Screw Co., The. Bolts, nuts, screws.

Auto & Power Appliance Co.—The Arcade. Mufflers, circulating pumps, timers.

Auto Shops Co.—731 Vincent Ave., N. E. Ammeters, voltmeters, valves, lifters, timers, storage batteries, primary batteries, spark coils, chain grips.

Avery Stamping Co., The.—5209 Lakeside Ave., N. E. Automobile tanks, brake drums, gear cases, gear shields, pressed and stamped steel parts of all kinds.

Balkwill Pattern Works.—970 Hamilton St. Patterns.

Bassett-Pressley Co.—Western Reserve Bldg. Sheets for auto bodies, hoods, fenders, tanks, iron or steel bars and sheets.

Billings-Chapin Co., The. Paints, varnishes.

Broc Co., The.—1665-1669 E. 40th St.; 4021-4023 Payne Ave. Bodies, tops, wind shields, tire carriers, trimmings, paintings.

Cambria Forge Co. Axles, crank shafts, drop forgings, steering apparatus, steering wheels, universal joints, valve stems.

Cleveland Cap Screw Co.—2216 Clarkwood Rd. Screws and bolts, valves, transmission shafts, cam shafts, truss rods.

Bultman Co., F. H., The.—2108 Superior Ave. Viaduct. Steering worms and gears, differential gears, transmission gears, sprockets.

Cleveland Faucet Co., The.—706 Frankfort Ave., N. W. Automobile pumps.

Cleveland Tanning Co.—Jennings and Dennison Aves., S. W. Leather.

Cleveland Varnish Co. Varnishes.

OHIO—Cleveland (Continued)

Cleveland Wire Spring Co. Waste cans, machinery springs, seat springs.

Colonial Brass Co.—316-318 Seneca St. Pump tire inflators.

Continental Caoutchouc Co.—525 Huron St. Tires.

Cray Bros.—1244 W. 9th St. Automobile tops, cushions, trimmings.

De Mooy Bros.—765-767 Wilson Ave. Gasolene marine motors.

Diamond Rubber Co.—1514 Euclid Ave. Tires.

Eagle Mfg. Co.—383 Prospect St. Automobile body polishes, metal polishes.

Electric Storage Battery Co.—Citizens Bldg. Sales office.

Elwell Parker Electric Co.—1076 Hamilton St. Electric controllers, electric motors.

Excelsior Spark Plug Co. Spark plugs.

Ferro Machine & Foundry Co.—115 Wade Bldg. Brass, bronze, aluminum and copper castings, gray iron castings, machine works to order, automobile motors, pattern makers, piston rings.

Ferry Cap & Set Screw Co.—2151 Scranton Rd. Screws.

Fisk Rubber Co.—318 Euclid Ave. Tires.

Forest City Brass Works. Brass, bronze, aluminum and copper castings.

Forest City Spring Works. Leaf springs.

Gabriel Horn Mfg. Co.—1407 E. 40th St., N. E. Exhaust horns, shock absorbers, muffler cut-out valves.

Glidden Varnish Co. Japans, varnishes, enamels.

Globe Machine & Stamping Co.—3868 Hamilton Ave., N. E. Brake, hub flanges, stampings, copper water jackets, gaskets, pipe flanges.

Goerss, Herman.—162 Russel Ave. Steering wheels.

Goodrich Co., B. F.—2188 9th St., S. E. Tires.

Goodyear Tire & Rubber Co.—326 Frankfort Ave., N. W. Tires.

Grant Lees Machine Co., The.—Quincy Ave. and E. 69th St. Special automobile machinery.

Gumelastic Tire Co., 920-922 Bolivar Rd. Tire fluid.

Hatcher Auto Parts Co.—2108 Superior Ave. Check valves, sight feed oilers, universal joints, crimping tools, tank strainers, pipe couplings, transmissions, engine oilers, grease cups, clutches, brakes, stampings, nipples.

OHIO—Cleveland (Continued)

Horsburgh & Scott Co. Metal gear wheels.
 Humphreys, J.—4038 Payne Ave. Tire boots.
 Hydraulic Pressed Steel Co.—E. 61st St. Pressed steel frames, stampings.
 Igniter Appliance Co.—723 Central Ave. Spark plugs and ignition devices.
 Inter-State Foundry Co. Gray iron castings.
 Kelly Handle Bar Co. Lamp brackets.
 King Optical Co., Julius.—Erie and Sheriff Sts. Goggles.
 Kirk Latty Co. Bolts, nuts and screws.
 Konigsloew Mfg. Co.—2279 Clarkwood Road. Steering gears, pumps, carbureters, brakes, exhaust heaters, metal stampings, special machinery.
 Krause, R. E.—8612 Wade Park Ave. Carbureters.
 Kundtz, Theo. Wood and metallic bodies, spark coil boxes.
 K. W. Ignition Co.—Whitney Bldg. Spark plugs, magnetos.
 Lamson & Sessions Co.—412-453 Scranton Ave. Bolts and nuts, wrenches.
 Lehman, I.—61 Middleton St. Steel tubing.
 Lennox Chemical Co. Tire inflating tanks.
 Long Arm System Co.—Lakeside Ave. and E. 38th St. Front and rear axles, change gears, clutches, propeller shafts, levers, buffers, steering reaches.
 Machinery Forging Co.—Hamilton and Marquette Sts. Drop forgings, machine works to order, screw machine products.
 Modern Auto Top & Equipment Co.—Ontario St. Auto tops.
 Monarch Instrument Co. Ammeters, voltmeters.
 Morgan & Wright.—1829 Euclid Ave. Tires.
 National Acme Mfg. Co., The.—Cor. Stanton Ave., S. E., and E. 75th St. Screw machine, products, cap and set screws, special milled goods.
 National Carbon Co.—Lock Drawer L. Dry cells, ignitor, auto cells, ignition batteries.
 National Screw & Tack Co. Bolts, nuts, screws.
 Nungesser Electric Battery Co.—3519 King Ave., N. E. Primary batteries.
 Ohio Blower Co., The.—330 Prospect Ave. Hoods, drip pans, fenders, tanks, seats, bodies, brazed and bent tubing, sheet metal parts, dashes, fenders.

OHIO—Cleveland (Continued)

Ohio Electric Works.—6304 Ellen Ave., N. W. Ignition dynamos, coils, electric flash lights and lanterns.
 Otis Steel Co. Steel castings.
 Palmer & DeMooy Foundry Co. Gray iron castings.
 Parish & Bingham Co. Pressed steel products, sprockets.
 Patterson-Sargent Paint Co. Enamels, paints, varnishes.
 Pennsylvania Rubber Co.—2134-2136 E. 9th St. Tires.
 Perfection Spring Co.—2414-2420 Superior Ave., N. W. Leaf springs.
 Puncture-Proof Tire Co.—Floor 6, Guardian Bldg., 332 Euclid Ave. Cushion tires.
 Reliance Gauge Column Co., The.—45 E. Prospect St. Water alarms and columns.
 Reliance Oil & Grease Co.—1501 Columbus Road. Lubricants, gas engine oil, lubricating oils, water gauges and columns, grease, oils.
 Republic Rubber Co.—1616 W. 3d St. Tires.
 Republican Belting & Supply Co. Leathers, belts, tools and tool kits.
 Ruprecht Electrical Co.—769 Cedar Ave. Storage batteries, magnetos, and ignition dynamos, spark coils.
 Sherwin, Williams Co., The.—601 Canal Road, N. W. Paints, varnishes, stains.
 Standard Foundry & Mfg. Co. Gray iron castings.
 Standard Welding Co., The. Rims, steel tubing.
 Sterling Mfg. Co.—416 American Trust Bldg. Ammeters, voltmeters, voltameters.
 Tyler Co., W. S.—1158 St. Clair St. Horns, sirens.
 Tregoning Electric Mfg. Co.—224 High Ave., S. E. Wire terminals.
 Union Bow Co.—421 Superior Ave., N. W. Bows.
 Union Steel Screw Co. Bolts, nuts, screws.
 United States Bronze Co. Aluminum, brake bands, brass, bronze, aluminum and copper castings, babbitt metals, bronze metals, aluminum solder.
 Upson Bolt & Nut Co. Bolts and nuts, washers.
 Van Dorn & Dutton Co., The.—2714 E. 79th St. Cut gears and gear cutting.
 Western Reserve Varnish Co. Varnishes.
 Willard Storage Battery Co. Storage batteries.

OHIO—Cleveland (Continued)

Publications.

Castings.

Engineers' Review.

Foundry.—Browning Bldg.

Power Boating.—Browning Bldg.

Power Wagon, The.—American Trust Bldg.

Repairing, Automobile.

Auto Shop Co., The.—731 Vincent Ave., N. E. (Thomas Flyer, Thomas-Detroit, Franklin.) Garage.

Buckeye Garage Co.—6112 Euclid Ave.

Cachat & Co., C. M.—1718 Crawford Rd.

Chisholm-Philips Automobile Co.—5906-5908 Euclid Ave. (Stevens-Duryea.) Garage, supplies.

Magoon Motor Co., R. H.—2174-2180 9th St., S. E. (Pope-Toledo.) Garage, supplies.

Moore, Harry S.—1761 Crawford Rd. (Stoddard-Dayton.) Garage.

Supplies, Automobile.

American Distributing Co., The. Selling Agts.: Long Arm System Co., Elyria Machine Parts Co., W. J. Sculley Mfg. Co. Imperial Wheel Co., Westinghouse Electric & Mfg. Co., Shepard Engineering Co., Cleveland Axle Mfg. Co.

Collister & Sayles.—224 Superior Ave., N. W.

Chisholm-Philips Automobile Co.—5906-5908 Euclid Ave. (Stevens-Duryea.) Garage, repairing.

Magoon Motor Co., R. H.—2174-2180 9th St., S. E. (Pope-Toledo.) Garage, repairs.

Miller, Chas. E.—406 Erie St. Manufacturers, jobbers, exporters, importers.

COLUMBUS—

Clubs and Associations.

Columbus Automobile Club.

Automobile Agents and Dealers.

Avery, F. E.—1199 Franklin Ave. (Packard, Franklin, Winton.) Repairing.

Bell, Chas. L.—824 Oak St. (Waltham.)

Boda & Co., Robert F.—22 E. Rich St. (National, Mitchell.) Repairing, garage.

Broad Oak Garage.—621-627 E. Broad St. (Rambler.)

Buckeye Motor Co.—201 S. High St. (Rambler.)

Clough, C. R. (Buick.)

Crum & Co., H. C.—958-960 N. High St. (Rambler, Jackson.)

Curtin Williams Auto Co.—119 Pater-son Ave. (Peerless, Pope-Toledo, Pope-Hartford, Stevens-Duryea, Autocar.)

Eclipse Automobile Co.—955 S. High St. (Haynes.)

OHIO (Continued)

Edwards, H. T.—850 N. High St. (Ford.)

Ford Auto Co.—688 N. High St. (Ford.)

Hixson-Wittmer Auto Co.—16 E. 5th Ave. (Premier.)

Maxwell Agency. (Maxwell.)

McDonald-Titus Co.—61 E. Spring St. (Reo, Mora.)

Metropolitan Motor Car Co.—E. 19th St. and Euclid Ave. (Stearns, Pierce Arrow, Cadillac.)

Orlando Kessler Automobile Co.—36 W. Capitol St. (Pope-Hartford, Pope-Toledo, Lozier.)

Roberts & Co., O. G.—152 N. Main St. (Stoddard-Dayton, Glide, Jackson.)

Southern Garage Co.—35-37 W. Mound St. (Buick.) Repairing, garage.

White Automobile Co.—976 N. High St. (Aerocar, White, Baker.)

Williams Auto Co., R. O.—621-623 Broad St. (Stearns.)

Automobile Manufacturers, Electric.

Columbus Buggy Co.

Automobile Manufacturers, Gasolene.

Columbus Buggy Co.

Okey Motor Car Co.

Garages.

Boda & Co., Robert F.—22 E. Rich St. (National, Mitchell.) Repairing.

Esswien, Sam. A.—24 W. Broad St.

Evans Automobile Co.—63 Fay St.

Imperial Garage Co.—Mound St.

Southern Garage Co.—35-37 W. Mound St. (Buick.) Repairing.

Motorcycle Manufacturers.

Buckeye Motor Co.—201 S. High St.

Parts and Accessories Manufacturers.

Albright Mfg. Co. Spark plugs.

American Auto Brass Co.—181 W. Maple St. Cushions, acetylene generators, lamps, metal trimmings.

American Castings Co.—809 Columbus S. & F. Bldg. Brass, bronze, aluminum and copper castings.

Barndt-Johnson Auto Supply Co., The.—422 Donaldson St. Designed, built, trimmed and painted automobile bodies, tops, wind shields.

Bott Bros. Mfg. Co., The.—166 N. High St. Metal polishes.

Brown Mfg. Co., J. B. Acetylene generators, lamps.

Bryant Steel Wheel & Rim Co.—454 Hayden Bank Bldg. Steel rims, tubular steel wheels.

Budd & Ranney Mfg. Co., The.—35-37 S. Scioto St. Gasolene automobile motors, gasolene marine motors.

Century Specialty Co.—401 Deshler Ave. Gasolene strainers.

OHIO (Continued)

Columbus Bolt Works.—162 W. Randolph St. Bolts and nuts, drop forgings, metal trimmings.
Columbus Brass Co. Brass, bronze, aluminum and copper castings.
Columbus Malleable Iron Co. Malleable iron castings.
Columbus Screw & Machine Co. Axles, screw machine products, steering apparatus, turn tables, universal joints.
Columbus Varnish Co. Varnishes.
Direct Driver Axle Co.—575 N. 4th St. Transmission axles.
Dougherty & Colt Mfg. Co.—105 W. Bridge St. Miscellaneous wearing apparel.
Hayden Co., N. L. Axles, clutches, gasoline auto motors.
Keystone Supply Co. Oils.
Laminated Tube Co. Steel tubing.
Lilley & Co., M. C. Miscellaneous wearing apparel, caps, gloves, leg-gings.
Midgley Mfg. Co. Steel rims, tubular steel wheels, brazing, electric weld-ing, pressed steel work.
New American Elevator Co.—Curtis and Jefferson Ave. Elevators for garages.
Peters & Herron Dash Co. Dashes, fenders.
Quad Mfg. Co., The.—35-37 S. Scioto St. Timers.
Vehicle Apron & Hood Co. Storm aprons and curtains, auto covers, lamp covers, automobile robes, tire cases, tire shoes, tire sleeves, tool bags, leggings.
Repairing, Automobile.
Avery, F. E.—1199 Franklin Ave. (Packard, Thomas Flyer, Franklin, Winton.)
Boda & Co., Robert F.—22 Rich St. (National, Mitchell.) Garage.
Buckeye Auto Co.—753 E. Long St.
Simpson, A.—24 W. Mound St.
Southern Garage Co.—35-37 W. Mound St. (Buick.) Garage.
Vulcanizing.
Murphy & Co., Thos. J.—119 S. Par-sons Ave.
Rubber Tire Repair Co.—85 E. Gay St.

COLUMBUS GROVE—

Automobile Agents and Dealers.
Core, G. W.—High St. (Mitchell.) Garage, repairing.
Morris, A. (Cadillac, Buick, Franklin.) Garage, repairing.
Garages.
Core, G. W.—High St. (Mitchell.) Repairing.
Morris, A. (Cadillac, Buick, Franklin.) Repairing.

OHIO (Continued)

Repairing, Automobile.
Core, G. W.—High St. (Mitchell.) Garage.
Morris, A. (Cadillac, Buick, Franklin.) Garage.

CLYDE—

Automobile Agents and Dealers.
Huss & Co., M. L.—W. Buckeye St. (Reo.)
Sanford, M. C. (Northern.)
Automobile Manufacturers, Gasolene.
Elmore Mfg. Co.
Parts and Accessories Manufacturers.
Perfection Storm Shield Co. Storm aprons, curtains.

CONNEAUT—

Automobile Agents and Dealers.
Webb & Son, W. H.—316 State St. (Rambler, Howe.) Garage, repairing.
Garages.
Webb & Son, W. H.—316 State St. (Rambler, Howe.) Repairing.
Repairing, Automobile.
Webb & Son, W. H.—316 State St. (Rambler, Howe.) Garage.

COSHOCTON—

Automobile Agents and Dealers.
Forbes, J. P.—Forbes Bldg. (Winton, Stoddard-Dayton.)

CRESTLINE—

Automobile Agents and Dealers.
Holcker Bros. Buggy Co. (Auburn.)

DAYTON—

Clubs and Associations.
Automobile Club of Dayton.—George Andrus, Sec.
Automobile Agents and Dealers.
Borderwisch & Glancy Automobile Co.—12 N. Jefferson St. (Ford, Queen.)
Dayton Automobile Co.—117 W. 4th St. (Premier, Jackson, Stoddard-Dayton, Jewel, Maxwell.)
Miami Motor Car Co.—117 E. 2d St. (Franklin, Haynes, Waltham.) Gar-age, repairing.
Peckham Carriage Co.—18 S. St. Claire St. (Buick, Cadillac, White.)
Wood, Harry.—c/o Dayton Auto Co. (Jewel.)

Garages.
Auto Garage & Repair Co.—31 E. 4th St.
Miami Motor Car Co.—117 E. 2d St. (Franklin, Haynes, Waltham.) Re-paring.
Shroyer & Co., G. W.

Motorcycle Agents and Dealers.
Schaefer & Co.—11 E. 2d St. (In-dian.)

Parts and Accessories Manufacturers.
Borchers Tonneau Mfg. Co. Wood and metallic bodies.

OHIO (Continued)

Boyer, Radford & Gordon Tank & Pump Co. Tanks, storage tanks.
 Brown & Co., S. N. Top bows, top fixtures.
 Buckeye Iron & Brass Wks.—324 E. 3d St. Aluminum, brass, bronze, and copper castings, pipe, brass fittings.
 Dayton Electrical Mfg. Co.—87 St. Clair St. Primary batteries, storage batteries, electric generators, magnetos and ignition dynamos, electric switches, dynamos, spark coils, spark plugs, timers.
 Dayton Folding Tonneau Co.—1141 N. Main St. Folding tonneaus and automobile bodies.
 Dayton Malleable Iron Co. Malleable iron castings.
 Dayton Mfg. Co.—2240 E. 3d St. Storage batteries, lamps.
 Berger Co., Joseph.—310-320 Hart St. Jacks.
 King Top Manufacturing Co. Automobile tops.
 Kinsey Mfg. Co. Battery boxes, dashes and fenders, pressed steel frames, hoods, lubricators, mufflers, pressed steel products, radiators, tanks.
 Kramer & Co., Wm. F. Automobile tops.
 Morgan & Wright.—405-411 E. 3d St. Tires.
 National Oil Pump & Tank Co. Oil pumps, tanks, storage tanks.
 New Era Gas Engine Co.—9 Dale Ave. Air compression.
 Nutting Machine Co. Carbureters, automobile motors.
 Pneumatic Tire Protector Co.—14-16 S. St. Clair St. Tire sleeves.
 Sterling Electric Motor Co. Charging apparatus, electric generators, electric motors.
Repairing, Automobile.
 Miami Motor Car Co.—117 E. 2d St. (Franklin, Haynes, Waltham.) Garage.

DEFIANCE—

Automobile Agents and Dealers.
 McClary, A. G. (Reo.)
Parts and Accessories Manufacturers.
 Defiance Machine Works. Special automobile machinery.

DELAWARE—

Automobile Agents and Dealers.
 Owen, H. F. (Cameron.)

DOYLESTOWN—

Automobile Agents and Dealers.
 Hartel, J. V. (Holsman.)

EAST LIVERPOOL—

Automobile Agents and Dealers.
 East Liverpool Auto Co. (Maxwell, Mitchell.)

OHIO (Continued)

Parts and Accessories Manufacturers.
 Brunt Porcelain Works, G. F. Porcelain.

EDON—

Automobile Agents and Dealers.
 Kiese, D. T. (Cadillac.)

ELYRIA—

Clubs and Associations.
 Elyria Automobile Club.—H. N. Address, Sec.

Automobile Agents and Dealers.
 Address, H. M.—W. Broad St. (Queen.)

Leonard, H. M.—625 W. Broad St. (Jackson.) Garage, repairs, supplies.

Automobile Manufacturers, Gasolene.
 Garford Automobile Co.

Garages.

Auto Inn.—345 W. 2d St.

Leonard, H. M.—625 W. Broad St. (Jackson.) Repairs, supplies.

Wick, H. B.

Parts and Accessories Manufacturers.

Columbia Steel Co. Steel and chrome nickel steel.

Elyria Machine Parts Co., The. Brass, bronze, aluminum and copper castings, screw machine products, steering apparatus.

Garford Co. Axles, brakes, channels, chassis, clutches, automobile gear cases, differential gears, transmission gears, levers, hubs, distance rods, running gears, sprockets, steel wool, steering wheels, wire wheels.
 Western Automatic Machine Screw Co. Bolts, nuts, screws, steps.

Repairing, Automobile.

Leonard, H. M.—625 W. Broad St. (Jackson.) Garage, supplies.

Supplies, Automobile.

Leonard, H. M.—625 W. Broad St. (Jackson.) Garage, repairs.

FARMERSVILLE—

Automobile Agents and Dealers.
 Fudge, L. (Holsman.)

FINDLAY—

Automobile Agents and Dealers.
 Electrical Construction & Supply Co. —537 S. Main St. (Columbus.)
 Motor Tavern.—Cor. Main and Front Sts. (Cadillac, Franklin.)

Garages.

Findlay Motor Car Co., The.—301 W. Crawford St.

Van Horn, Grant.

FOSTORIA—

Automobile Agents and Dealers.
 Adams, Henry J.—Tiffin St. (Reo.)
 Fostoria Automobile Machine Co.—McDougal and Poplar Sts. (Pope-Toledo.)

Fostoria Garage & Motor Co.—123 E. Tiffin St. (Franklin, Elmore, Pope-Hartford, Pope-Waverley.)

OHIO (Continued)

FREMONT—

Automobile Agents and Dealers.
Beelman, Chas. S.—400 W. State St.
(Oldsmobile.)
Fremont Novelty Works.—507 N.
State St. (Pope-Waverley.)
Stine & Parks.—Arch St. (Reo.)
Automobile Manufacturers, Gasolene.
Lehr Agricultural Co.
Garages.
June Bros.—Garrison St.
Parts and Accessories Manufacturers.
Imperial Steel Co., The.—218 Front
St. Steel castings, hubs.
Safe Storm Shield Co. Storm aprons
and curtains.

GALION—

Garages.
Unkrich, Fred.—Shaefer Block.

GENEVA—

Repairing, Automobile.
Throop, B. M.—33 Walnut St.

GEORGETOWN—

Automobile Agents and Dealers.
Andrews & Fite. (Jewel.)

GRAFTON—

Garages.
Knaf, W. M.

GREENFIELD—

Automobile Agents and Dealers.
Price, C. W. (Cadillac.)

GREENVILLE—

Automobile Agents and Dealers.
Eikenberry, A. L.—126 W. 4th St.
(Northern.)
Ream Bros, Auto Agency.—606-608
Broadway. (Knox, Waltham, White,
Packard, Buick, Cadillac, Franklin.)
Repairing, Automobile.
Lucas, C. O.—Front St.

HAMILTON—

Automobile Agents and Dealers.
Hamilton Motor Car Co.—26 N. 2d
St. (Buick, Elmore.) Garage, re-
pairing.
West Side Motor Co. (Wayne.)
Garages.
Hamilton Motor Car Co.—26 N. 2d
St. (Buick, Elmore.) Repairing.
Wilson, C. D. & Parrish, L. M.
Parts and Accessories Manufacturers.
Advance Mfg. Co.—B St. Gasolene
motors and transmissions.
Repairing, Automobile.
Hamilton Motor Car Co.—26 N. 2d
St. (Buick, Elmore.) Garage.

HILLSBORO—

Automobile Agents and Dealers.
Groth, Geo. H. (Jewel, Waltham.)

IRONTON—

Automobile Agents and Dealers.
Sohner, J. W. (Ford.)

JANTON—

Automobile Agents and Dealers.
Burgener, W. H. (Jewel.)

OHIO (Continued)

KENSINGTON—

Automobile Agents and Dealers.
Cox, J. W. (Jewel.)

KENTON—

Automobile Agents and Dealers.
Glenn, W. J. (Maxwell.)
Rosenthal, Arthur M.—North and De-
troit Sts. (Reo, Premier, Winton.)

LARUE—

Automobile Agents and Dealers.
Davis, Newton H. (Ford.)

LEBANON—

Automobile Agents and Dealers.
Kilpatrick, J. A. (Maxwell.)

LEIPSIC—

**Automobile Manufacturers, Gasolene
Commercial.**
American Foundry Co.

LIMA—

Clubs and Associations.
Lima Automobile Club.—F. T. Cuth-
bert, Sec.
Automobile Agents and Dealers.
Lima Automobile Co. (Jackson.)
Mack, H. A.—206 E. Market St.
(Buick, Cadillac, Franklin.)
Ohler, J. O. (Mitchell.)
Rudy, W. E.—125 E. Market St. (Ford,
Premier.)

Repairing, Automobile.

Mullenhour Mfg. Co., F. W.—122 N.
Union St.

LISBON—

Garages.
Morrison, Robert.

LOCKLAND—

Automobile Agents and Dealers.
Richardson Paper Co. (American
Mercedes.)
Parts and Accessories Manufacturers.
Carey Mfg. Co., Philip. Asbestos.

LORAIN—

Automobile Agents and Dealers.
Lorain Automobile Co. (Elmore.)
Sprague Bros.—115 5th Ave. (Rich-
mond.)
Parts and Accessories Manufacturers.
Brown-Cochran Co., The. Gasolene
marine motors.

LOUISVILLE—

Parts and Accessories Manufacturers.
Buckeye Jack Mfg. Co. Jacks.

MANSFIELD—

Automobile Agents and Dealers.
Cavin, J. H. (Jewel.)
Hering, W. C.—26 E. 4th St. (Jack-
son, Ford.)
Keith, B. B.—226 W. 5th St. Pope-
Waverley.)
Mansfield Auto Co.—60 N. Mulberry
St. (Buick, Cadillac.)

Garages.

Brown, J. M.

OHIO (Continued)

Parts and Accessories Manufacturers.
Humphreys Mfg. Co.—201 E. 5th St.
Pumps, enameled ware, brass castings.

Ohio Brass Co. Brass, bronze, aluminum and copper castings, gasoline tank gauges, adjustable lamp brackets, lubricators, oil pumps, steering apparatus.

MARIETTA—

Automobile Agents and Dealers.
Anderson Bros.—147 Front St. (Buick.)
Offenbacher, A. B.—525 3d St. (Pope-Waverley.)
Schram, J. C. (Jackson.)
Wood, W. W.—133 Greene St. (Maxwell.)

Parts and Accessories Manufacturers.
Goebel, F. A. Electric switches, electric lock switches.

MARION—

Automobile Agents and Dealers.
Marion Auto Co. (Maxwell, Ford, Mora, Reo, Rambler.)
Stoltz, C. C.—126-128 N. Prospect St. (Autocar, Buick.) Garage, supplies, repairing.

Garages.

Stoltz, C. C.—126-128 N. Prospect St. (Autocar, Buick.) Repairing, supplies.

Parts and Accessories Manufacturers.
Archer Auto Tire Co., The.—548 W. Center St. Cushion tires.

Repairing, Automobile.

Stoltz, C. C.—126-128 N. Prospect St. (Autocar, Buick.) Garage, supplies.

Supplies, Automobile.

Stoltz, C. C.—126-128 N. Prospect St. (Autocar, Buick.) Garage, repairing.

MARYSVILLE—

Garages.

Armstrong & Son.

Parts and Accessories Manufacturers.
Standard Stamping Co. Automobile heaters.

MASSILLON—

Automobile Agents and Dealers.
Massillon Motor Car Co.—76 S. Erie St. (Ford.)
Automobile Manufacturers, Gasolene.
Forest City Motor Car Co.

MCCOMB—

Automobile Agents and Dealers.
Cavin, J. H. (Jewel.)

MIDDLEFIELD—

Automobile Agents and Dealers.
Ohio Pail Co. (Monarch.)

MIDDLETOWN—

Automobile Agents and Dealers.
Shetter, A. B. (Cadillac.)
Motorcycle Manufacturers.
Miami Cycle & Mfg. Co.—Grand Ave.

OHIO (Continued)

MILFORD—

Parts and Accessories Manufacturers.
Novelty & Repair Shop. Tube expanders.

NELLIE—

Automobile Agents and Dealers.
Freese, A. D. (Jewel.)

NEWARK—

Automobile Agents and Dealers.
Beecher, J. S.—21 E. Church St. (Cadillac.)
Hess & White's New Garage.—61 S. 3d St. (National, Mitchell.)
Mills, Chas.—21 E. Church St. (Mitchell.)
Mills Auto & Bicycle Co. (Cadillac.)
Garages.
Wyeth, C. E.—47 W. Main St.
Parts and Accessories Manufacturers.
Newark Iron & Steel Co. Steel castings.

NEW PARIS—

Automobile Agents and Dealers.
Wehrly, H. A. (Waltham.)

NILES—

Automobile Agents and Dealers.
Taylor, Wade A. (Pope-Hartford.)

NORTH LEWISBURG—

Automobile Agents and Dealers.
Benedict, J. H. (Waltham.)

NORWALK—

Parts and Accessories Manufacturers.
Sprague Umbrella Co. Automobile tops and fronts.

NORWOOD—

Automobile Agents and Dealers.
Fredway, W. S. (Wayne.)
Garages.
Norwood Automobile Co.

PAINESVILLE—

Automobile Agents and Dealers.
Automobile Garage Repair Co. (Winton.)

PIQUA—

Repairing, Automobile.
Meinders, Ed. H.—211 W. High St.

PLAIN CITY—

Parts and Accessories Manufacturers.
Neer Air Cooled Engine Co. Motors.

PLYMOUTH—

Automobile Manufacturers, Gasolene Commercial.
Commercial Motor Truck Co.

PORT CLINTON—

Motorboat Manufacturers.
Matthews Boat Co.

PORTSMOUTH—

Automobile Agents and Dealers.
Friel, W. J. (Ford.)
Pritchard, R. S.—39-41 Gallia Ave. (Winton, Buick, Pope-Waverley.)
Repairing, garage.
Automobile Manufacturers, Gasolene Commercial.
Ideal Mfg. Co.

OHIO (Continued)

Garages.

Pritchard, R. S.—39-41 Gallia Ave.
(Winton, Buick, Pope-Waverley.)
Repairing.

Parts and Accessories Manufacturers.
Scott Muffler Co., The.—71 Gallia St.
Miscellaneous wearing apparel, mufflers.

Repairing, Automobile.

Pritchard, R. S.—39-41 Gallia Ave.
(Winton, Buick, Pope-Waverley.)
Garage.

PROSPECT—

Parts and Accessories Manufacturers.
Nottings & Son. Gasolene marine motors.

RAVENNA—

Automobile Agents and Dealers.
Mark, Davis. (Reo.)

RICHWOOD—

Automobile Agents and Dealers.
Biddle, W. A. (Maxwell.)

RISING SUN—

Automobile Agents and Dealers.
Blessing, J. W. (Blessing.)

ST. MARYS—

Garages.
Wertz, Charles.—113 Front St.

SALEM—

Automobile Agents and Dealers.
Baker, C. R.—10 W. Main St. (Ford, Queen.)
Fifer, Chas. (Mitchell.)

Motorcycle Agents and Dealers.

Baker, C. R.—10 W. Main St. (Marsh.)

Parts and Accessories Manufacturers.

Mullins Co., W. H. Wood and metallic bodies, battery boxes, dashes, fenders, drip pans, hoods, tanks.

Motorboat Manufacturers.

Mullins Co., W. H.

SALINA—

Automobile Agents and Dealers.
Lappe, J. H. (Jewel.)

SANDUSKY—

Automobile Agents and Dealers.
Granagan, P. J.—Jackson St. (Ford.)
Garage, repairing.

Prout & Sons, A. H. (Frayer-Miller.)

Automobile Manufacturers, Gasolene.

Barnes Mfg. Co.

Automobile Manufacturers, Gasolene Commercial.

Hinde & Dauch.

Garages.

Granagan, P. J.—Jackson St. (Ford.)
Repairing.

Motorboat Manufacturers.

Davis Boat Works.

Parts and Accessories Manufacturers.

Sandusky Foundry & Machine Co.
Gas engines.

Vim Motor Co., The. Marine motors.

OHIO (Continued)

Vincent Valve Co., The. Brass, bronze, aluminum and copper castings, throttle valves.

Repairing Automobile.

Granagan, P. J.—Jackson St. (Ford.)
Garage.

SHELBY—

Automobile Agents and Dealers.

Simons, G. O. (Winton.)

SIDNEY—

Automobile Agents and Dealers.

Bush Bros.—Cor. Ohio and South Sts.
(Reo.)

Parts and Accessories Manufacturers.

Tucker Wood Works Co. Seat bendings, steering wheels.

SPRINGFIELD—

Clubs and Associations.

Springfield Automobile Clut.—G. E. Mente, Sec.

Automobile Agents and Dealers.

Gaither, Wm.—28-30 N. Fountain Ave. (Franklin, Mitchell.)

King Garage Co.—87½ W. Main St.
(Cadillac.)

Mentel's Auto Agency. (Jackson.)

Mentel, G. E.—130 Stanton Ave.
(Jackson.)

Automobile Manufacturers, Gasolene.

Lear Auto Co., Oscar.

Parts and Accessories Manufacturers.

Nolte-Brass Co. Brass, bronze, aluminum and copper castings, throttle valves.

Shawver Co. Jacks, pump tire inflators, tire tools.

Springfield Machine Tool Co.—Southern Ave. Lathes and shapers.

Victor Rubber Co., The. Rubber mats, bow spreaders.

STEUBENVILLE—

Automobile Agents and Dealers.

Collins Bros. (Mitchell.)

Garages.

Low, F. E.

Parts and Accessories Manufacturers.

La Belle Iron Works. Sheet iron and steel, wrought iron and steel pipe.

SUNBURY—

Parts and Accessories Manufacturers.

Sunbury Mfg. Co. Anti-skid devices.

TIFFIN—

Automobile Agents and Dealers.

Kalbfleisch, G. C. (Maxwell.)

Tiffin Cycle & Auto Co. (Pope-Waverley.)

Garages.

Landis, Eberhardt.

Repairing, Automobile.

Klais, H. P.—123 E. Market St.

TOLEDO—

Clubs and Associations.

Toledo Automobile Club.

OHIO (Continued)

Automobile Agents and Dealers.

Atwood Automobile Co.—2815 Monroe St. (Franklin, Elmore, Pope-Hartford, Pope-Waverley.)

Central Carriage Co.—134 Ontario St. (Queen, Auburn, Maxwell, Mitchell.)

Craig Garage Co.—1213 Madison Ave. (Jewel, Wayne, Stoddard-Dayton.)

Dosson Carriage Co.—909 Jefferson Ave. (Holsman.)

Kirk Bros. Auto Co.—915 Jefferson Ave. (Buick, Thomas Flyer, Studebaker.)

Lichtie Auto Co.—818 Jefferson Ave. (Cadillac.)

Pope Motor Car Co. (Pope-Toledo.)

Rivers-Jacoby Auto Co.—2651 Monroe St. (Rambler, Jackson, Craig-Toledo.)

Toledo Motor Boat & Power Co., The. (Haynes.)

Toledo Motor Car Co.—1012 Madison Ave. (Columbia, Winton, American Mercedes, Pope-Toledo, Baker.)

Torgler, E. R. (Jewel.)

Twenty-Second St. Garage. (Ford.)

Weed Garage, The.—233 Ontario St. (Columbus.)

White Garage.—1215 Madison Ave. (White.)

Automobile Manufacturers, Gasolene.

Craig-Toledo Motor Co., The.—Gardner Bldg.

Pope Motor Car Co.

Automobile Manufacturers, Gasolene Commercial.

Shop of Siebert, The.

Garages.

Acme Rubber Co.—925 Jefferson Ave. Rental.

Alexander, W. G.—116 10th St.

Antler Stable & Garage Co.

Collingwood Garage Co.—Collingwood and Bancroft Sts.

Cooney Automobile Co.

Fulton St. Garage Co.

Maher Garage Co.—120-122 W. 22d St.

Motorboat Manufacturers.

Hepburn, J. W.

Toledo Motor Boat & Power Co., The.

Motorcycle Agents and Dealers.

Lewis, John C.—3033 Monroe St. (Indian.)

Motorcycle Manufacturers.

Consolidated Mfg. Co.

Parts and Accessories Manufacturers.

Arc-Toledo Spark Plug Co. Spark plugs.

Baker Bros.—Westlake and Post Sts. and M. C. R. R. Special automobile machinery.

OHIO (Continued)

Brown Oil Can Co.—Dawson St. Oil cans, storage tanks.

Consolidated Mfg. Co. Drop forgings.

Field, Frank C.—605 N. St. Clair St. Monograms.

Kroh Mfg. Co., C. Z. Storm aprons and curtains, auto tops, cloth and carpet trimmings.

Landers Bros. Co.—445 10th St. Celluloid sheet, auto robes, rubber cloth, cloth and carpet metals.

Monarch Mfg. Co. Grease, oils, metal polishes.

National Cement & Rubber Mfg. Co.—3053-3059 Monroe St. Cements, friction tape, automobile graphites and greases, metal polishes, kits, brazing forges.

Ophthalmoscope Co. Eye shields.

Paragon Refining Co., The. Grease, oils and semi-solid oils.

Rathbun & Lacy Co. Marine motors.

Toledo Storage Battery Co.—102 Oliver St. Storage batteries.

Rental Service.

Acme Rubber Co.—925 Jefferson Ave. Garage.

Repairing, Automobile.

MacInnis, D. A. & J. C.—120 Michigan St.

National Cement & Rubber Mfg. Co.—3053-3059 Monroe St.

TROY—

Automobile Agents and Dealers.

Faulkner & Bowers. (Reo.)

Pearson, Warren. (Waltham.)

Parts and Accessories Manufacturers.

Troy Carriage Sunshade Co. Automobile tops, wind shields.

VAN WERT—

Automobile Agents and Dealers.

McDonald, D. L. (Winton, Cadillac.)

Wert Motor Car Co. (Ford, Rambler, Maxwell.)

WAPAKONETA—

Automobile Agents and Dealers.

Schemmel, Geo. C. (Maxwell.)

Zimmerman Hardware Co. (Richmond.)

Garages.

Wahrer, Roofus.

Parts and Accessories Manufacturers.

Wapakoneta Wheel Co. Wood wheels.

WARREN—

Automobile Agents and Dealers.

Park Hardware Co. (Jewel.)

Reliance Machine Co.—40 S. Park Ave. (Maxwell.)

Valley Automobile Co.—133 E. Market St. (Cadillac, Baker, Pope-Hartford, Pope-Toledo.)

Warren Motor Car Co. (Ford.)

OHIO (Continued)

Motorcycle Agents and Dealers.
Reliance Machine Co.—40 S. Park Ave.
(R. S. motorcycles.)
Parts and Accessories Manufacturers.
Packard Electric Co.—399 North Ave.
Insulated wire.

WEST LIBERTY—

Automobile Agents and Dealers.
Dodson, E. (Winton.)

WEST MANCHESTER—

Automobile Agents and Dealers.
Leas, J. & J. (Premier.)

WILLIS—

Automobile Agents and Dealers.
Van Wye, John E. (Maxwell.)

WINCHESTER—

Parts and Accessories Manufacturers.
O. K. Gas Engine Works. Gasolene
automobile motors.

WOODFIELD—

Automobile Agents and Dealers.
Brown, Chas. A. (Jewel.)

WOOSTER—

Automobile Agents and Dealers.
Ginter, J. M.—18 Walnut St. (Reo.)

XENIA—

Automobile Agents and Dealers.
Baldner Motor Vehicle Co.—Church
and Whitney Sts. (Mitchell.) Re-
pairing.

Repairing, Automobile.

Baldner Motor Vehicle Co.—Church
and Whitney Sts. (Mitchell.)

YOUNGSTOWN—

Clubs and Associations.
Youngstown Automobile Club.—Geo.
L. Fordyce, Sec.

Automobile Agents and Dealers.
Brown, C. E.—309 W. Federal St.
(Ford.) Garage, repairing.

Burt, H. B.—25 N. Phelps St. (Wal-
tham.)

Falcon Motor Works.—114 Wick Ave.
(Baker.)

Hamilton, P. H. (Jewel.)

Ritter, J. F. Wm.—123 N. Phelps St.
(Peerless, Packard.) Repairing.

Standard Auto Garage Co.—234 N.
Phelps St. (Buick, Franklin, Pope-
Waverley.)

Wilkerson, Geo. S. (Rauch & Lang.)
Garages.

Brown, C. E.—309 W. Federal St.
(Ford.) Repairing.

Flynn, Walter F.—110 Market St.

Parts and Accessories Manufacturers.
Finished Steel Co.—1623 Wilson Ave.
Steel.

Mahoning Rubber Co. Pneumatic
tires.

Republic Rubber Co., The. Tire ce-
ment, removable rims, pneumatic
tires, solid tires.

Youngstown Iron, Steel & Tube Co.
Sheet iron and steel.

OHIO (Continued)

Youngstown Sheet & Tube Co.
Wrought iron and steel pipes.

Repairing, Automobile.

Brown, C. E.—309 W. Federal St.
(Ford.) Garage.

Ritter, J. F. Wm.—123 N. Phelps St.
(Peerless, Packard.)

ZANESVILLE—

Automobile Agents and Dealers.

Buckeye Garage.—S. 8th St., nr. Main
St. (Reo, Ford.)

Fritz Bros.—19 N. 6th St. (Winton,
Cadillac.)

McLaughlin, W. A. (Jewel.)

Garages.

Clark, Frederick A.—Main and 3d Sts.

OKLAHOMA

EL RENO—

Clubs and Associations.

Automobile Club of El Reno.—W. D.
DeVarney, Sec.

ENID—

Automobile Agents and Dealers.

Oklahoma Automobile Co.—806 Broad-
way. (Cadillac, American.)

OKLAHOMA CITY—

Automobile Agents and Dealers.

Binns, Andy.—207 Grand Ave. (Pope-
Toledo.)

Gloyd, S. M. (Wayne.)

Jeffries Auto Co.—207 W. California
St. (Cadillac, Lambert, Maxwell.)

Oklahoma Motor Car Co.—515 W.
Main St. (Rambler, Ford, Pope-
Waverley, Reliance, Mason, Ameri-
can.)

Garages.

Everest, J. H.—Lee Bldg.

PONCA CITY—

Automobile Agents and Dealers.

Koller Hdw. Co. (Waltham.)

WAYNOKA—

Automobile Agents and Dealers.

Green, C. F. (Cadillac.)

WOODWARD—

Automobile Agents and Dealers.

Workman, R. A. (Waltham.)

OREGON

ASTORIA—

Automobile Agents and Dealers.

Reliance Electrical Works. (Wal-
tham.)

PORTLAND—

Automobile Agents and Dealers.

Cook Motor Car Co.—15th and Wash-
ington Sts. (Royal, Stevens-Duryea.)

Covey & Wallace Motor Co.—16th and
Alder Sts. (Pierce Arrow, Cadillac,
Locomobile, Knox, Peerless.)

Crone-Graham Motor Car Co. (Knox.)

Dolson Auto Co.—406 McKay Bldg.
(Dolson.)

OREGON (Continued)

Gibson & Walker. (Dolson.)
 Keats Auto Co., H. L.—80 7th St.
 (Thomas Flyer, Thomas Detroit,
 Pope-Toledo, Pope-Hartford, Pope-
 Waverley, Franklin, Buick, Oldsmo-
 bile.) Garage, repairing.
 Kelly, J. B.—212 2d St. (White.)
 Mitchell, Lewis & Staver Co. (Mitch-
 ell.)
 Pullman Motor Car Co. (Jackson.)
 Studebaker Bros Co., N. W.—330 E.
 Morrison St. (Studebaker.)

Garages.

Bergman, N. J.—Alder and 15th Sts.
 Keats Auto Co., H. L.—80 7th St.
 (Thomas Flyer, Thomas Detroit,
 Pope-Toledo, Pope-Hartford, Pope-
 Waverley, Franklin, Buick, Oldsmo-
 bile.) Repairing.

Wenne, E. H.—W. Park St.

Motorcycle Agents and Dealers.

Balloo & Wright.—86 6th St. (In-
 dian.)

Repairing, Automobile.

Keats Auto Co., H. L.—80 7th St.
 Thomas Flyer, Thomas Detroit,
 Pope-Toledo, Pope-Hartford, Pope-
 Waverley, Franklin, Buick, Oldsmo-
 bile.) Garage.

PRAIRIE CITY—

Automobile Agents and Dealers.

Hall, E. H. (Waltham.)

PENNSYLVANIA

ALLEGHENY—

Automobile Agents and Dealers.

Allegheny Auto Co.—915 Irwin Ave.
 (Rapid, Glide.)

Artzbarger, W. H.—Milroy Ave.
 (Model.)

Park Garage Co.—210 W. Ohio St.
 (Walter, Corbin.)

Automobile Manufacturers, Steam.

Pittsburg Machine Tool Co.

**Automobile Manufacturers, Steam
 Commercial.**

Pittsburg Machine & Tool Co.—Lar-
 cock and Darrah Sts.

Garages.

Hardy Automobile Co., C. H.—529 2d
 St.

Manchester Auto Machine Co.

Parts and Accessories Manufacturers.

Jorden, R. H.—110 Sheridan St. Pis-
 ton rings.

Standard Leather Co.—296 Spring
 Garden Ave. Enameled leather.

Wisconsin Graphite Co. Crucibles,
 graphite, grease.

Repairing, Automobile.

Hipwell Mfg. Co.—100 Worth Ave.

PENNSYLVANIA (Continued)

ALLENTOWN—

Automobile Agents and Dealers.

Berwin Automobile Co.—128-132 N.
 8th St. (Elmore, Oldsmobile, Lo-
 comobile.) Garage, repairing.

Dietrich, O. H.—24 N. 10th St. (Buick,
 Thomas Flyer, Franklin, Cadillac.)

Hiestand, Daniel, Dr.—140 N. 4th St.
 (Maxwell.)

Nadig Mfg. Co., Chas. H.—N. 4th St.
 (Waltham.)

Rabenold, W. F.—28 N. 11th St. (Am-
 erican, Berliet, Dolson, Dragon.)
 Garage, repairing.

Reber, C. D. (Atlas.)

**Automobile Manufacturers, Gasolene
 Commercial.**

Mack Bros. Motor Car Co.

Garages.

Berwin Automobile Co.—128-132 N.
 8th St. (Elmore, Oldsmobile, Lo-
 comobile.) Repairing.

Rabenold, W. F.—28 N. 11th St. (Am-
 erican, Berliet, Dolson, Dragon.)
 Repairing.

Parts and Accessories Manufacturers.

Nadig Bro. Mfg. Co., C. H. &—1624
 N. 4th St. Steam engines.

Repairing, Automobile.

Berwin Automobile Co.—128-132 N.
 8th St. (Elmore, Oldsmobile, Lo-
 comobile.) Garage.

Rabenold, W. F.—28 N. 11th St. (Am-
 erican, Berliet, Dolson, Dragon.)
 Garage.

ALTOONA—

Clubs and Associations.

Automobile Club of Blair County.—
 R. H. Fay, Sec.; P. O. Box, 455.

Automobile Agents and Dealers.

Altoona Motor Car Co.—712 Greene
 Ave. (Rambler, Reo, Ford, Jack-
 son.)

Wolfe, W. H. & L. C.—1011 Chestnut
 Ave. (Thomas, Winton, Studebaker,
 Pope-Toledo, Autocar, Buick.) Gar-
 age, repairing.

Garages.

Wolfe, W. H. & L. C.—1011 Chestnut
 Ave. (Thomas, Winton, Studebaker,
 Pope-Toledo, Autocar, Buick.) Re-
 pairing.

Repairing, Automobile.

Wolfe, W. H. & L. C.—1011 Chestnut
 Ave. (Thomas, Winton, Studebaker,
 Pope-Toledo, Autocar, Buick.) Gar-
 age.

AMBLER—

Garages.

Johnson, D. E.

Parts and Accessories Manufacturers.

Keasby & Matteson Co. Asbestos,
 portable houses, packing.

PENNSYLVANIA (Continued)

ARDMORE—

Automobile Manufacturers, Gasolene.
Autocar Co., The.

AUBURN—

Parts and Accessories Manufacturers.
Delaware Seamless Tube Co. Steel
tubing.

BANGOR—

Clubs and Associations.

Bangor Automobile Club.—A. Fred
Seem, Sec.; 104 Market St.

Automobile Agents and Dealers.

Bangor Auto Garage & Motor Co.—
2d and Market Sts. (Rambler.)

Deshler, O. R. (Pope-Hartford.)

BEAVER—

Automobile Agents and Dealers.

Donaldson Hardware Co. (Winton.)

BEAVER FALLS—

Automobile Agents and Dealers.

Fair Bros.—1908 7th Ave. (Jackson.)

McCreery & Sons.—1625 6th Ave.
(Gale, Reo.)

Parts and Accessories Manufacturers.

Pittsburg Seamless Tube Co. Steel
tubing.

Union Drawn Steel Co. Steel.

Standard Connecting Rod Co. Con-
necting rods, crank shafts, valve
stems.

Standard Gauge Steel Co. Steel.

BELLEFONTE—

Automobile Agents and Dealers.

Lyons, John P. (Cadillac.)

BERWYN—

Parts and Accessories Manufacturers.

American Bronze Co. Bronze metals.

BETHLEHEM—

Clubs and Associations.

Bethlehem Automobile Club.

Automobile Agents and Dealers.

Hoffman & Shimer.—21 Broad St.
(Reo.)

Lehigh Valley Auto Co.—46 Broad St.
(Lambert.)

Lovatt, J. N. (Haynes.)

Martin, W. E.—Goepp St. (Knox.)

Snyder, O.—57 Broad St. (Chadwick,
Logan, Pierce-Racine.)

Snyder, Robt. J. (Holsman.)

Trumbauer, W.—836 Delaware Ave.
(Ford.)

Automobile Manufacturers, Gasolene.

Bethlehem Automobile Co.

Garages.

Wright, H. E.—33 Vinyard St.

BLOOMSBURG—

Clubs and Associations.

Bloomsburg Automobile Club.

Automobile Agents and Dealers.

Bloomsburg Auto Co.—East and 3d
Sts. (Franklin.)

Slagle, W. F. (Holsman.)

PENNSYLVANIA (Continued)

BRADFORD—

Garages.

Demler, Wm.—18 Kennedy St.

Dresser, S. R.

Motorcycle Manufacturers.

Bradford Motor Co.

Phillips & Hamilton.

Parts and Accessories Manufacturers.

American Wood Rim Co. Wood
rims, steering wheels.

Bradford Motor Works. Carbureters.

Emery Mfg. Co. Grease, oil.

BRAEBURN—

Parts and Accessories Manufacturers.

Braeburn Steel Co. Bar iron and
steel.

BRIDGEPORT—

Automobile Agents and Dealers.

David, Wm. P. (Maxwell.)

BROOKVILLE—

Automobile Manufacturers, Gasolene.

Twyford Motor Car Co.

BRYN MAWR—

Automobile Manufacturers, Gasolene.

Pennsylvania Auto Motor Co.

BUFFALO MILLS—

Automobile Agents and Dealers.

Dibert, C. C., Dr. (Waltham.)

BURNHAM—

Parts and Accessories Manufacturers.

Logan Iron & Steel Co. Bar iron and
steel.

BUTLER—

Garages.

McIntire-Willetts Mfg. Co., Monroe
and Cunningham Sts.

CARBONDALE—

Garages.

Simpson, J. J.

Parts and Accessories Manufacturers.

Carbondale Chemical Co. Anti-freez-
ing solutions.

CARLISLE—

Automobile Agents and Dealers.

Carlisle Auto & Supply Co.—13 Main
St. (Winton, Cadillac, Pope-Waver-
ley.)

Drawsbaugh, W. N.—39 Dickinson
Ave. (Winton, Cadillac, Pope-
Waverley.)

Parts and Accessories Manufacturers.

Carlisle Body & Gear Works. Wood
and metallic bodies.

CARNEGIE—

Parts and Accessories Manufacturers.

Superior Steel Co. Steel.

CHAMBERSBURG—

Automobile Agents and Dealers.

Kriner, J. J. (Jewel.)

Pfoutz, D. G.—N. 2d St. (Franklin,
Cadillac, Pope.)

Stover, H. L.—144 S. Main St. (Reo,
Rambler.)

PENNSYLVANIA (Continued)

CHARLEROI—

Garages.

Spencer Bros.

CHERRYVILLE—

Parts and Accessories Manufacturers.

Frantz Auto Co. Body irons.

CHESTER—

Clubs and Associations.

Automobile Club of Delaware County.

—Dr. H. H. Stoever, Sec.

Automobile Agents and Dealers.

Chester Automobile Co.—Broad and Crosby Sts. (Cadillac, Baker.)

Trainer & Co., T. W.—Cambridge Bldg. (Glide, Jackson.)

Garages.

Pierson, Jesse D.—Washington and Olive Sts.

Parts and Accessories Manufacturers.

American Steel Castings Co. Steel castings.

Chester Forging & Engineering Co., The.—Broad and Crosby Sts. Crank shafts.

Johnson Motor Co., The. Automobile motors.

Keystone Drop Forge Co. Drop forgings.

Modoc Co.—Market St. Oils, automobile body polishes, soaps.

South Chester Tube Co. Wrought iron and steel pipe.

CHESTNUT HILL—

Automobile Agents and Dealers.

Allen, Alex. (Cadillac.)

Chestnut Hill Motor Co.—Chestnut Ave. and Bethlehem Pike. (Clement-Bayard.)

CLARION—

Automobile Agents and Dealers.

Clarion Automobile Co.—Main St. (Jackson.)

CLEARFIELD—

Automobile Agents and Dealers.

Harders Gun Works.—10 Market St. (Waltham, Thomas, Buick.)

COATESVILLE—

Automobile Agents and Dealers.

Coatesville Garage.—3d Ave. and Main St. (Pope-Waverley, Winton.)

Taylor, James.—Taylor House. (Ramblor.)

Garages.

Speakman & Bousall.—105 Main St.

Parts and Accessories Manufacturers.

Lukens Steel Co. Steel.

COLUMBIA—

Garages.

Helligrass, H. M.—Locust St.

Automobile Agents and Dealers.

Meyers, Chas. S.—318 Cherry St. (Ramblor.)

PENNSYLVANIA (Continued)

CONNEAUT—

Garages.

Lewis, I. M.

CONNELLSVILLE—

Automobile Agents and Dealers.

Evans, F. T.—136 S. Pittsburg St. (Ramblor.)

CONSHOHOCKEN—

Parts and Accessories Manufacturers.

Longmead Iron Co. Wrought iron and steel pipes.

CORRY—

Clubs and Associations.

Corry Motor Club.—W. Edw. Marsh, Sec.

Automobile Agents and Dealers.

Barlow Hardware Co. (Winton.)

Garages.

Brown & Co., T. H.—141 N. Centre St.

Parts and Accessories Manufacturers.

Raymond Mfg. Co. Machinery springs.

COUDERSPORT—

Parts and Accessories Manufacturers.

Currier, Gardner & Bullis. Differential gears.

Garages.

Wood, Allan.

DOYLESTOWN—

Automobile Agents and Dealers.

Doylestown Auto & Motor Cycle Repair Shop.—18 Donaldson St. (Cadillac, Pierce Arrow.)

Garages.

Donnelly, John J.

EAST DOWNINGTOWN—

Automobile Agents and Dealers.

Downingtown Garage & Repair Co., Inc.—E. Lancaster Ave. (Waltham.)

EASTON—

Automobile Agents and Dealers.

Crane, E. F., Holland Garage.—200 S. 3d St. (Pullman.)

Easton Automobile Co.—41 Delaware St. (Franklin, Buick, Pope-Waverley.) Garage, repairing.

King, G. Russell. (Jackson.)

Sherrer, F. A., M. D. (Mitchell.)

Smith, John E. (Maxwell.)

Garages.

Easton Automobile Co.—41 Delaware St. (Franklin, Buick, Pope-Waverley.) Repairing.

Enterprise Garage.—316-320 Washington St.

Fisher Auto Storage Co.—219 Ferry St.

Hill, C. F.—327 Ferry St.

Werner, W.—401 Northampton St.

Repairing, Automobile.

Easton Automobile Co.—41 Delaware St. (Franklin, Buick, Pope-Waverley.) Garage.

PENNSYLVANIA (Continued)

EAST STROUDSBURG—

Automobile Agents and Dealers.

Burnett, L. H. (Holsman.)

Porter, F. R. (Rambler.)

Garages.

East Stroudsburg Auto Co.

EBENSBURG—

Automobile Agents and Dealers.

Rosensteel, John E.—High St. (Mitchell.)

Parts and Accessories Manufacturers.

Tindel-Morris Co. Crank shafts, machinery for manufacturing automobile shafts.

EDGEWORTH—

Automobile Agents and Dealers.

Edgeworth Machine Co.—Meadow Rd. (Packard, Franklin, Waltham, Pope-Waverley.) Garage, repairing.

Garages.

Edgeworth Machine Co.—Meadow Rd. (Packard, Franklin, Waltham, Pope-Waverley.) Repairing.

Repairing, Automobile.

Edgeworth Machine Co.—Meadow Rd. (Packard, Franklin, Waltham, Pope-Waverley.) Garage.

ELIZABETHTOWN—

Automobile Agents and Dealers.

Grayhill, S. G. (Cadillac, Winton.)

ELKLAND—

Garages.

Brown, L. W.

EMLENTON—

Parts and Accessories Manufacturers.

Sterling Oil Co. Oils.

EPHRATA—

Automobile Agents and Dealers.

Butzer, John S.—Washington Ave. (Maxwell, Reo, Rambler.)

Kimports Auto Co., M. (Ford.)

ERIE—

Clubs and Associations.

Erie Motor Club.—W. O. Davis, Sec.

Automobile Agents and Dealers.

Dench, C. R.—455 W. 11th St. (Corbin.)

Hawkins, Chas. T. (Knox.)

Johnson, P. T., Dr. (Frayer-Miller, Lambert.)

Kelly, Chas. F. U.—c/o Continental Rubber Works. (Haynes.)

McIntyre, Geo. B.—1221 State St. (Cartercar.)

Murphy, A. H.—918 State St. (Pope-Toledo, Rauch & Lang, Elmore.)

Murphy Bros.—22 Park Row. Franklin, Winton, Thomas Flyer.)

Roth, Jacob.—1117 State St. (Cadillac, Peerless.)

Warfel & Arbuckle.—1601 State St. (Waltham, Pope-Waverley.) Repairing.

Automobile Manufacturers, Gasolene.

Modern Tool Co.

PENNSYLVANIA (Continued)

Garages.

Bay State Machine Co.—121 Peach St.

Raser, H. F.—609 French St.

Star Electrical & Garage Co.—609-613

French St. Repairing, supplies.

Totman Carriage Works.—12th and French Sts.

Motorcycle Agents and Dealers.

Lejeal Cycle & Mobile Works.—17 Sassafras St. (Indian.)

Parts and Accessories Manufacturers.

Bay State Machine Co.—1302-04-06 Peach St. Marine motors.

Cascade Foundry Co.—19th and Plum Sts. Gray iron castings.

Continental Rubber Works. 19th and Liberty Sts. Automobile sundries, inner tubes, vulcanizing, material, automobile tires, mechanical rubber goods.

Erie Forge Co. Connecting rods, crank shafts.

Erie Foundry Co. Gray iron castings.

Erie Stamping & Mfg. Co.—646 W. 12th St. Oil and grease cups.

Jarecki Manufacturing Co. Pipe, brass fittings.

Watson Co., H. F. Asbestos.

Repairing, Automobile.

Star Electrical & Garage Co.—609-613 French St. Garage, supplies.

Warfel & Arbuckle.—1601 State St. (Waltham, Pope-Waverley.)

Supplies, Automobile.

Star Electrical & Garage Co.—609-613 French St. Garage, repairing.

FLEETWOOD—

Automobile Agents and Dealers.

Seaman & Merkel. (Rambler, Reo.)

FRANKLIN—

Automobile Agents and Dealers.

Franklin Motor Co. (Pope-Toledo.)

Leach, Ed. E. (Holsman.)

Venango Auto Station. (White.)

Parts and Accessories Manufacturers.

Franklin Portable Crane & Hoist Co.

Special automobile machinery, portable cranes and hoists.

Marion Mfg. Co. Torch heaters, oils.

GERMANTOWN—

Clubs and Associations.

Automobile Club of Germantown.—

Mark B. Reeves, Sec.; 141 Phila-Ellena St.

GIRARD—

Parts and Accessories Manufacturers.

Pennsylvania Ball & Roller Bearings Co. Ball and roller bearings.

GLENROCK—

Automobile Agents and Dealers.

Bubbs, Amos. (Maxwell.)

PENNSYLVANIA (Continued)

GREENSBURG—

Automobile Agents and Dealers.

Greensburg Automobile Co. (Peerless.)

Henry & Sheffler Co. (Cameron.)

HANOVER—

Automobile Agents and Dealers.

Adams, W. J. (Maxwell.)

Parts and Accessories Manufacturers.

Heindel Mfg. Co. Crank cases, special metal cylinders.

HARRISBURG—

Clubs and Associations.

Motor Club of Harrisburg.—J. Sidney Sible, Sec.

Automobile Agents and Dealers.

Capitol City Motor Co.—904 Market St. (Lambert.)

Central Pennsylvania Auto Co.—111 Market St. (Buick, Cadillac, Pope-Toledo, Pope-Waverley, Winton, Franklin, White, Pope-Hartford.)

Harrisburg Auto Co.—3d and Hamilton Sts. (Stanley, Reo, Rambler, Logan, National, Babcock.) Garage, repairing.

Hickok Mfg. Co., W. O.—North and Canal Sts. (Mitchell.)

Keystone Motor Car Co.—1019 Market St. (Rapid, Pullman, Maxwell.)

Motor Vehicle Co.—Mulberry and Crescent Sts. (Atlas, Iroquois, Jackson, Cameron, Ford.)

Pletcher, M. H. (Monarch.)

Redmond, Andrew.—N. 3d and Boyd Sts. (Columbus.)

Garages.

Harrisburg Auto Co.—3d and Hamilton Sts. (Stanley, Reo, Rambler, Logan, National, Babcock.) Repairing.

Smith & Zimmerman.—Smith and Raleigh Sts.

Parts and Accessories Manufacturers.

Harrisburg Pipe & Pipe Bending Co. Wrought iron and steel pipe.

Repairing, Automobile.

Harrisburg Auto Co.—3d and Hamilton Sts. (Stanley, Reo, Rambler, Logan, National, Babcock.) Garage.

HAZELTON—

Garages.

Eidam, Adam.—15 N. Wyoming St.

HOMESTEAD—

Automobile Agents and Dealers.

Hoffer, J. M. (Cameron.)

Parts and Accessories Manufacturers.

Doyle Hose Union Co.—810 Ann St. Hose couplings.

HOMEWOOD—

Garages.

Belmar Garage.—521 Homewood Ave. Union Automobile Co.

PENNSYLVANIA (Continued)

HUNTINGDON—

Automobile Agents and Dealers.

Vuille, Chas. A.—819 Washington St. (Cadillac, Franklin.)

Parts and Accessories Manufacturers.

Vuille, Chas. A. Hydrometers.

INDIANA—

Supplies, Automobile.

Indiana Electric Co.—724 Philadelphia St.

JEANETTE—

Parts and Accessories Manufacturers.

Pennsylvania Rubber Co. Tires, inner tubes, single tube tires, rubber mats, bumpers, tubing hose.

JERSEY SHORE—

Automobile Agents and Dealers.

Glosser, S. A. (Cadillac.)

Jersey Shore Cycle Co. (Winton.)

JOHNSTOWN—

Automobile Agents and Dealers.

Johnstown Automobile Co.—235 Bedford St. (Wayne, Rambler, Queen, Peerless.)

Price, P. M. (Stearns.)

Trabold, A.—217 Woodvale Ave. (Mitchell.)

Parts and Accessories Manufacturers.

Cambria Forge Co. Axles, crank shafts, drop forgings, steering apparatus, steering wheels, universal joints, valve stems.

KINGSTON—

Garages.

Kingston Garage & Motor Car Co.

LANCASTER—

Clubs and Associations.

Lancaster Automobile Club.—Jacob D. Rider, Sec.; 20 N. Queen St.

Automobile Agents and Dealers.

Central Auto Co. (Franklin.)

Futer, B. Franklin.—213 N. Duke St. (Maxwell, Acme.) Garage, repairing.

Kinports Auto Co., M.—126 E. Orange St. (Ford.)

Lancaster Automobile Co.—215 N. Prince St. (Buick, Pope-Toledo, Pope-Waverley, Winton.)

Landis, Samuel K.—122 E. Chestnut St. (Logan, Reo, Jackson, Premier.)

National Auto & Supply Co.—Cor. Duke St. (Rambler, Crawford, Marmon.)

Williams, Harvey R. (Queen.)

Garages.

Futer, B. Franklin.—213 N. Duke St. (Maxwell, Acme.) Repairing.

Parts and Accessories Manufacturers.

Safety Buggy Co. Wood and metallic bodies, automobile tops.

Standard Ball Axle Co. Axles.

Star Ball Retainer Co. Ball retainers.

PENNSYLVANIA (Continued)

Repairing, Automobile.

Futer, B. Franklin.—213 N. Duke St.
(Maxwell, Acme.) Garage.

LANGHORNE—

Automobile Agents and Dealers.

Langhorne Transportation Co. (Reo,
Knox, Elmore.)

LEBANON—

Automobile Agents and Dealers.

Beamsderfer, A. B. (Pope-Toledo.)
Ideal Machine & Auto Co.—19 S. 9th
St. (Cadillac, Franklin.)

Kilpatrick, A. J. (Maxwell.)

Kinports Auto Co., M.—126 E. Orange
St. (Ford.)

Lebanon Motor Works.—12th and
Walnut Sts. (Upton.)

Automobile Manufacturers, Gasolene.

Lebanon Motor Works.

Garages.

Weaver, Jos. W.—621 Spring Alley.

Motorcycle Agents and Dealers.

Wolf, John F.—Forge and Willow Sts.
(Indian.)

Parts and Accessories Manufacturers.

American Iron & Steel Mfg. Co.
Bolts, nuts, bar iron and steel,
washers.

LENOVER—

Automobile Manufacturers, Gasolene.

Chalfant Motor Car Co.

LEWISTOWN—

Automobile Agents and Dealers.

Lewistown Motor Car Co. (Pullman.)

LOCKHAVEN—

Automobile Agents and Dealers.

Armstrong, Calvin R. (Pope-Toledo,
Franklin, Buick, Cadillac.)

Lock Haven Auto Co. (Pope-Toledo,
Franklin.)

McKEESPORT—

Automobile Agents and Dealers.

Childs, Walter H.—1300 5th Ave.
(Dolson.)

Garages.

Leek, S. L.—9th Ave. and Mulberry
St.

Parts and Accessories Manufacturers.
National Tube Co. Steel tubing.

McKEE'S ROCKS—

Parts and Accessories Manufacturers.

Lockhart Iron & Steel Co. Angle,
channel and tee iron and steel, bar
iron and steel.

MALVERN—

Garages.

Edwards, Ralph.—State Road.

Repairing, Automobile.

Meadville Auto Garage.—838 Market
St.

MEADVILLE—

Parts and Accessories Manufacturers.

Randall, G. N.—1094 Frenck St. Steam
engines.

PENNSYLVANIA (Continued)

MECHANICSBURG—

Clubs and Associations.

Cumberland Valley Automobile Ass'n.

Parts and Accessories Manufacturers.

Wilcox Mfg. Co., D. Drop forgings.

MEYERSDALE—

Automobile Agents and Dealers.

Auto Garage Co. (Maxwell.)

MILFORD—

Automobile Agents and Dealers.

De Berthe, Louis. (Northern, Buick,
Cadillac.)

MILLVILLE—

Automobile Agents and Dealers.

Eaves, J. (Cadillac.)

MILTON—

Clubs and Associations.

Automobile Club of Central Pennsyl-
vania.—F. R. Slifer, Sec.

Automobile Agents and Dealers.

Colvin, E. F. (Cadillac.)

NOXEN—

Parts and Accessories Manufacturers.

Automobile Buggy Top Co. of Amer-
ica. Automobile tops.

MUNCY—

Automobile Agents and Dealers.

Gever, Clinton. (Cadillac.)

MT. CARMEL—

Automobile Agents and Dealers.

Watkins, J. M. (Maxwell.)

MT. JOY—

Parts and Accessories Manufacturers.

Gray Iron Castings Co. Gray iron
castings.

NEW BRIGHTON—

Parts and Accessories Manufacturers.

Pittsburg Machine Co., The. Hose
couplings, automobile motors.

NEWCASTLE—

Automobile Agents and Dealers.

Hileman, E. E. (Queen, Rambler.)
Newcastle Auto Co.—27 Cochran St.
(Pope-Toledo.)

Parts and Accessories Manufacturers.

Elliott Blair Steel Co.—Taylor and
Mercer Sts. Steel.

NEW KENSINGTON—

Automobile Manufacturers, Gasolene.

Fort Pitt Motor Mfg. Co.

NEWTOWN—

Parts and Accessories Manufacturers.

Link Belt Engineering Co. Chains.

NORRISTOWN—

Automobile Agents and Dealers.

Hoy, P. V.—Main St. (Pierce Ar-
row.)

Templeton, D. E. — Montgomery
House. (Maxwell.)

Garages.

Norris City Garage.—Main and Chain
Sts.

NORTHEAST—

Automobile Agents and Dealers.

Fernald, Geo. H. (Maxwell.)

PENNSYLVANIA (Continued)

Parts and Accessories Manufacturers.
Eureka Tempered Copper Works.
Brass, bronze, aluminum and copper castings.

OAKMONT—

Parts and Accessories Manufacturers.
Crescent Forgings Co. Drop forgings.

OIL CITY—

Automobile Agents and Dealers.
Lucus Co., W. P.—255 Elm St.
(Thomas Flyer, Haynes, Pope-Hartford.)
Robinson, J. E. (Elmore.)
Weaver, C. H.—255 Elm St. (Buick, Oldsmobile, Royal.)

Garages.

Co-Eck Garage Co.

Parts and Accessories Manufacturers.
Oil City Oil & Grease Co. Naptha, illuminating oil.

OVERBROOK—

Garages.

Machkeller, Henry.

PATTON—

Automobile Agents and Dealers.
Cole, Jos. (Grout, Elmore.)

PECKVILLE—

Garages.

Peck, J. D.

PHILADELPHIA—

Clubs and Associations.

Automobile Club of Philadelphia.—H. Bartol Brazier, Sec.; 1811 Fitzwater St.

Cape May Automobile Club.—J. Hiscock, Sec.; 438 S. Penn Square.

Ladies' Quaker City Motor Club.

Movignante Klubo, The.

Quaker City Motor Club.—H. C. Harbach, Sec.

Automobile Agents and Dealers.

Adamson, Prescott.—N. W. Cor. Broad and Spring Garden Sts. (Columbia.) Repairing.

American Auto Garage.—933 N. 7th St. (American.)

American Locomotive Motor Car Co.—239 N. Broad St. (Berliet.)

Autocar Co.—249 N. Broad St. (Autocar.)

Auto Livery.—1313 Irving St. (Elmore.)

Auto Maintenance Co.—1141 S. Broad St. (Riviera.)

Bergdoll Motor Car Co.—323 N. Broad St. (Welch, Benz.)

Brazier Auto Works.—38th and Market Sts. (Marmon.) Garage, repairing.

Brown Motor Co., H. Oscar.—229 N. Broad St. (Berliet.)

Cameron Motor Car Co.—303-305 N. 15th St. (Cameron.)

PENNSYLVANIA—Phila. (Continued)

Cartercar Co.—1519 Belmont Ave. (Cartercar.)

Chadwick Engineering Works.—3207 Spring Garden St. (Chadwick.)

Costa Motor Car Co. (Clement-Bayard.)

Dalley & Barrows, 128 N. Broad St. (Fiat.)

Dalley & Schill.—230 N. 22d St. (American.)

Dalsimer Auto Co.—1200 Market St. (Haynes.)

DeLancey Garage.—22nd and Pine Sts. (Earl.)

Dorris Motor Car Co.—729 S. Broad St. (Dorris.)

Dragon Motor Co.—31st, 32d and Chestnut Sts. (Dragon.)

Eastern Automobile Co.—326 N. Broad St. (Lozier, Stevens-Duryea.)

Eaton, D. O.—236 N. Broad St. (Rapid.)

Ford Motor Co.—445-451 N. Broad St. (Ford.)

Foss-Hughes Motor Car Co.—201 N. Broad St. (Pierce Arrow, Knox, Cadillac, Baker.) General garage work, electrical charging, repair shop.

Frazier & Reynolds.—214 S. 23d St. (Wayne.)

French, L. E.—205 N. Broadway. (Pullman.)

Fuller & Thornton.—2028 Sansom St. (Simplex.)

Gawthorp & Wister.—244 N. Broad St. (Elmore.)

General Motor Car Co.—249 N. Broad St. (Autocar.)

Gilmore, W.—262 N. Broad St. (Deere.)

Girard Motor Car Co.—236 N. Broad St. (Cleveland.)

Gorson's Auto Exchange.—617-619 Arch St. (Second-hand cars.) Repairing.

Hamilton Auto Co.—206 N. Broad St. (Stoddard-Dayton.)

Hills Motor Car Co.—130 N. Broad St. (Royal, Rochet-Schneider.)

Haupt Co., Harry S.—139 S. Broad St. (Thomas Flyer.) Repairing, garage.

Hughes, D. W.—1001 Chestnut St. (Manhattan.)

International Motor Car Co.—514-516 N. Broad St. (Walter, Darracq.)

Jeffrey & Co., Thos. B.—207 N. Broad St. (Rambler.)

Keir, J. L.—310 N. Broad St. (Renault.)

PENNSYLVANIA—Phila. (Continued)

Kelsey Motor Car Co.—204 N. Broad St. (Maxwell, Mors, Mora.)
 Keystone Motor Car Co.—238 N. Broad St. (Buick, Packard.)
 Klauder, Francis. (C. G. V.)
 Knox Motor Car Co.—510 N. Broad St. (Knox.)
 Locomobile Co. of America.—249 N. Broad St. (Locomobile.)
 Magraw, W. M. F.—249-251 N. Broad St. (Autocar.)
 Mercedes Import Co.—153 N. Broad St. (Mercedes.)
 Morse, I. J.—245 N. Broad St. (Locomobile.)
 Motor Shop.—317 N. Broad St. (Stearns, Oldsmobile.)
 National Supply Co. (Waltham.)
 Northwestern Motor Car Co.—1928-1930 N. 20th St. (Moline.) Repairing, garage.
 Penn Motor Car Co.—680 N. Broad St. (Mitchell.)
 Philadelphia Auto Co.—338 N. Broad St. (Apperson.)
 Philadelphia Auto Sales Co. (Jewel, Reliance, Dolson.)
 Philadelphia Motor Car Co.—236 N. Broad St. (Fraye-Miller.)
 Wanamaker Co., John. (Merkel.)
 Phil-Penn Motor Co.—206 Drexel Bldg. (Fraye-Miller.)
 Powell's Garage.—1404 Ridge St. (Fraye-Miller.)
 Quaker City Auto Co.—138-146 N. Broad St. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Peerless, Franklin.) Garage, repairing.
 Reo Motor Car Co. of Philadelphia.—242 N. Broad St. (Reo, Premier.) Repairing.
 Rittenhouse Garage.—214-220 S. 23d St. (American Mercedes, Wayne.) Repairing, garage.
 Scull, John L.—259 N. Broad St. (Acme.)
 Simplex Auto Co.—336 N. Broad St. (Renault, Panhard, Isotta-Fraschini.)
 South Broad Automobile Co.—729 S. Broad St. (Dorris, Duryea.) Repairs, supplies, garage, renting, electric charging.
 Spalding & Bros., A. G.—336 N. Broad St. (Stevens-Duryea.)
 Spencer Motor Co.—316 N. Broad St. (Jackson.)
 Sprinkle, W. Judson.—242 N. Broad St. (Hotchkiss, Reo, Premier.)
 Strieby & Stevenson.—322 N. Broad St. (Paragon.)
 Tioga Automobile Co.—Broad and Tioga Sts. (National.)

PENNSYLVANIA—Phila. (Continued)

Titman Leeds & Co.—128 N. Broad St. (Matheson, Studebaker.)
 Twining Co., Thos. W.—326 N. Broad St. (Crawford, Marion.)
 West-Stillman Motor Car Co.—153 N. Broad St. (Pennsylvania, Mercedes.)
 White Co.—639 N. Broad St. (White.)
 Winton Motor Carriage Co.—246-248 N. Broad St. (Winton.) Garage.
 Zim-Kel Motor Car Co.—320 N. Broad St. (Pungs-Finch.)
Automobile Manufacturers, Electric.
 Electric Vehicle Equipment Co.—20th and Montgomery Ave.
Automobile Manufacturers, Electric Commercial.
 Commercial Truck Co. of America. Arcade Bldg.
Automobile Manufacturers, Gasolene.
 Chadwick Engineering Wks.—Spring Garden and 32d Sts.
 Dragon Motor Co.—31st, 32d and Chestnut Sts.
 Vandegrift Automobile Co.—13th and Cumberland Sts.
Automobile Manufacturers, Steam.
 Halsey, James T.—336 New York Ave.
Electric Charging.
 Foss-Hughes Motor Car Co.—201 N. Broad St. (Pierce Arrow, Knox, Cadillac, Baker.) Repairing, garage.
 South Broad Automobile Co.—729 S. Broad St. (Dorris, Duryea.) Supplies, garage, repairing, renting.
Garages.
 Baltimore Ave. Garage.—49th and Baltimore Ave.
 Bellevue-Stratford Garage.—49th and Baltimore Ave.
 Brazier Auto Works.—38th and Market Sts. (Marmon.) Repairing.
 Broad St. Garage.—215-217 N. Broad St.
 Central Garage.—314 S. Camac.
 DeLancey Garage.—22d and Pine Sts.
 Electric Vehicle Co.—502 N. Broad St.
 Fifty-First St. Auto Station.—51st St. and Beaumont Ave.
 Foss-Hughes Motor Car Co.—201 N. Broad St. (Pierce Arrow, Cadillac, Knox, Baker.) Repairing, electric charging.
 Gemehl, Camile.—1406 Chancellor St.
 Germantown Garage.—6225 Germantown Ave.
 Greenwalt, H. F.—823 N. Carlisle St.
 Hartz, M. M.—23d and Spring Garden Sts.
 Houpt Co., Harry S.—139 S. Broad St. (Thomas Flyer.) Repairing.

PENNSYLVANIA—Phila. (Continued)

Hump Motor Garage.—2532-2534 N. Broad St.
 McCullough & Son, J. H.—219 N. Broad St.
 McGiehan Odometer & Mfg. Co.—970 Drexel Bldg.
 Mercury Auto Co.—2119 N. Broad St.
 Motor Car Livery.—1406 Chancellor St.
 Milford, D. L.—1801 N. 21st St.
 Northern Garage.—3315 N. 13th St.
 Northwestern Motor Car Co.—1928-1930 N. 20th St. (Moline.) Repairing.
 Park Garage Co.—2212-2214 Spring Garden St.
 Parkin & Sons.—2417 N. Broad St.
 Quaker City Auto Co.—138-146 N. Broad St. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Peerless, Franklin.) Repairing.
 Regent Garage.—4618 Regent St.
 Rittenhouse Garage.—214-220 S. 23d St. (American Mercedes, Wayne.) Repairing.
 Roman Automobile Co.—1907 Market St.
 Short & Bros., John J.—2028 Sansom St.
 South Broad Automobile Co.—729 S. Broad St. (Dorris, Duryea.) Repairs, supplies, renting, electric charging.
 Van Pelt Auto Co.—26 Van Pelt St.
 Western Garage.—218 S. 40th St.
 Winton Motor Carriage Co.—246-248 N. Broad St. (Winton.)
Motorboat Manufacturers.
 Yacht, Launch & Engine Co.
Motorcycle Agents and Dealers.
 Krauss, Chas.—1406 Oxford St. (Indian.)
Motorcycle Manufacturers.
 Bradley Motor Co.—268 Diamond St.
 Driver, Walter.—700 W. Lehigh Ave.
 Siddard, Wm. A.—10 Bellevue Ave.
 Steffey Mfg. Co.—2722 Brown St.
 Twining Auto Co.—218 N. Broad St.
***Parts and Accessories Manufacturers.**
 Ajax-Grieb Rubber Co.—1413 Race St. Tires.
 Allison Mfg. Co. Lock nuts and washers.
 Altemus & Co., C. L.—4th and Locust Sts. Primary timers, secondary distributors.
 Anderson & Co., F. W.—729 S. Broad St. Automobile tops, slip covers, tire irons, trunk racks, painting, iron and steel works, seats.
 Asbestos Mfg. Co. Asbestos.

PENNSYLVANIA—Phila. (Continued)

Atwater-Kent Mfg. Works.—42-46 W. 6th St. Ammeters, voltmeters, magnetos, ignition dynamos, timers, electric switches.
 Auto Instrument Co.—228 N. 4th St. Timers.
 Belfield & Co., H. Brass, bronze, aluminum and copper castings, automobile clocks, pipe and brass fittings, pressure gauges.
 Brown Auto Top Co. Automobile tops.
 Caldwell Co.—136 S. 14th St. Brake bands, brass, bronze and aluminum and copper castings.
 Chicago Electric Mfg. Co.—435 N. Broad St. Automobile clocks.
 Clark & Co., A. F.—2130 W. Susquehanna Ave. Storage batteries.
 Consolidated Rubber Tire Co.—315 N. Broad St. Tires.
 Cramp & Son Ship & Engine Building Co.—Beach and Ball Sts. Crank cases, axles, gear cases, gearing levers, lamp and tire brackets, slat-irons and seat castings.
 Crescent Phosphorized Metal Co.—2314-2318 Wood St. Brass and copper metals.
 Crispin Sheet Steel Metal Mfg. Co.—3038-3046 Chestnut St. Pressed steel products and stampings.
 Darby & Sons Co., Edward.—233 Arch St. Lockers.
 Diamond Rubber Co.—304-306 N. Broad St. Tires.
 Dieble, Wm.—904 Lippincott Bldg. Spark plugs.
 Dixon Crucible Co., Joseph.—1020 Arch St. Graphite, grease oil.
 Electric Storage Battery Co.—Allegheny Ave. and 19th St. Storage batteries.
 Electric Vehicle Equipment Co.—20th St. and Montgomery Ave. Electric controllers, and electric motors.
 Empire Gear & Top Co.—413 N. 22d St. Automobile covers, cushions, foot rests, robe rails, automobile seats, automobile tops, glass wind shields.
 Felton Sibley & Co.—136-140 N. 4th St. Enamel, paints, varnishes.
 Firestone Tire & Rubber Co.—211 N. Broad St. Tires.
 Fisk Rubber Co.—140 N. Broad St. Tires.
 Flagg & Co., Stanley G. Malleable iron castings, steel castings.
 Galvanizing Co. Bolts, nuts, carburizers, galvanizing, angle, channel and tee iron and steel, bar iron and steel, washers.

PENNSYLVANIA—Phila. (Continued)

Gasket Supply Co.—1516 Sansom St. Gaskets.
 Gausler & Starr. Automobile robes.
 Gerhab, Jacob.—158-164 N. 3d St. Drop forgings, cloth and carpet trimmings.
 Goodrich Co., B. F.—1332 Arch St. Tires.
 Goodyear Tire & Rubber Co.—1404 Ridge Ave. Tires.
 Helios Mfg. Co., Bridesburg. Lamps, flaming arc lamps, storage batteries, ignition storage batteries, wash meters, switches, switch and panel boards.
 Hess-Bright Mfg. Co.—19th and Hamilton Sts. Ball bearings.
 Holmes Fibre Graphite Co.—5155 Wakefield St. Graphite.
 Homer Brass Works.—231 Racine St. Bronze, brass, aluminum and copper castings, machine work to order.
 Horstman Co., Wm. H.—5th Ave. and Cherry Sts. Cloth and carpet trimmings.
 Howe Scale Co.—509 Market St. Gasolene marine motors.
 Ivins Tube Works, Elwood.—Oak Lane Station. Steel, brass, copper and aluminum tubings.
 Janney Steinmetz & Co.—4th and Market Sts. Malleable iron castings, stampings, tanks, tire irons, gasolene lock valves, wrenches, pressed steel products.
 Jones, Frank S.—629 Filbert St. Machine work to order.
 Kellom & Co., Charles F.—128 Arch St. Oils, lubricating compounds, semi-fluid compounds.
 Keystone Brass Foundry Co.—188 Berks St. Aluminum, brass, bronze, aluminum and copper castings.
 Keystone Electrical Instrument Co.—9th St. and Montgomery Ave. Ammeters, voltmeters.
 Keystone Lubricating Co. Grease.
 Keystone Spring Works, Inc.—13th and Buttonwood Sts. Leaf springs.
 Klauder, Chas. L.—B St. and Allegheny Ave. Leather.
 Klenzene Co.—1710 Market St. Automobile body polishes, automobile body soaps.
 Lonergan & Co., J. E.—211-215 Race St. Lubricating devices, valves, steam gauges, pressure reducing valves.
 Lucas & Co., John. Paints, automobile body polishes, varnishes.
 Magnet Cement & Dressing Co.—878 N. 48th St. Tire cement.

PENNSYLVANIA—Phila. (Continued)

Mechanical Electrical Construction Co. Marine motors.
 Merchant & Evans Co.—517 Arch St. Importers and manufacturers, "Hele-Shaw" clutches, change speed gear, metal tire cases, axles, frames and special steels.
 Merritt & Co.—1022-1030 Ridge St. Lockers, shelving.
 Middleton, Arthur H.—2821 N. Broad St. Selling agent, Hubbard patent tire.
 Midvale Steel Co. Chrome nickel steel, steel.
 Monarch Rubber Co.—41 N. 7th St. Rubber mats, cloth and carpet trimmings.
 Morgan & Wright.—Cor. 13th and Cherry Sts. Tires.
 Morse, Williams & Co.—West End Trust Bldg. Steering apparatus.
 Motor Car Specialty Co.—112 N. Broad St. Speedistimeters, speedometers, filters.
 Newbein Co., S. C.—430 Walnut St. Automobile body polishes, metal polishes.
 N. & G. Taylor Co.—308 Chestnut St. Solder.
 National Casket Co. Lap robes, raincoats, automobile heaters.
 Nice, Eugene E.—272-274 S. 2d St. Varnishes.
 North Penn. Iron Co.—3d and Venango Sts. Turntables.
 Noxal Polish Mfg. Co.—1238 Belmont Ave. Metal polishes.
 Otto Gas Engine Works.—33d and Walnut Sts. Automobile and marine motors.
 Penn Iron Works Co.—50th St. and Lancaster Ave. Gasolene automobile motors.
 Pennsylvania Petroleum Co.—117 N. 2d St. Oils.
 Pennsylvania Rubber Co.—615 N. Broad St. Tires.
 Petzelt & Heyser.—24th and Locust Sts. Wood and metallic bodies, tops.
 Philadelphia Steel & Wire Co.—525 Commerce St. Belting.
 Philadelphia Storage Battery Co.—Emerald and Tioga Sts. Primary batteries.
 Philadelphia Stove & Iron Foundry Co.—1631 N. 5th St. Gray iron castings.
 Phila. Grease Mfg. Co.—The Bourse. Greases and oils.
 Phosphor Bronze Smelting Co.—2200 Wash. Ave. Brass, bronze, aluminum and copper castings, babbitt metals, bronze metals.

PENNSYLVANIA—Phila. (Continued)

Pressed Steel Mfg. Co.—454 The Bourse. Steel balls, ball bearings.
Queen & Co., Inc.—8th and Arch Sts. Ammeters, voltmeters, spark coils, sparking points.
Quint & Sons, S. H.—15 S. 4th St. Name plates, steel stamps and stencils.
Ramsey Mfg. Co.—472 Bullitt Bldg. Motors.
Rath Mfg. Co.—Hancock, Laurel and 2d Sts. Metal polishes.
Rech & Sons, Jacob.—8th St. and Girard Ave. Wood and metallic bodies.
Reeves & Son, Paul S.—1415 Catherine St. Brass, bronze, aluminum and copper castings, babbitt metals, bronze metals.
Rose Mfg. Co.—910 Arch St. Lamps.
Rowlands, Wm. & Harvey.—Frankford. Leaf springs.
Rubber Tire Co., The.—1215 Arch St. Cellular tires.
Rue Mfg. Co.—215 Race St. Collapsible buckets, drop forgings, ejectors.
Rumpp & Sons, C. F. Hampers, watch holders.
Schofield, Mason & Co.—Fairhill, Reese and Cumberland Sts. Wool and jute carpets.
Schrack & Co., C.—152 N. 4th St. Packing and varnishes.
Schwarz Wheel Co.—Glenwood Ave., above 20th St. Wood wheels.
Smith & Co., Albanus L.—1305 Arch St. Flexible tubing.
Smith, Chas A.—Church Lane and P. & R. Ry., Germantown. Steering gears, trunk racks, auto motors, transmissions.
South Broad Automobile Co.—729 S. Broad St. Automobile tops and bodies.
Standard Roller Bearing Co.—48th St. and Girard Ave. Axles, steel balls, ball bearings, roller bearings, hubs.
Stow Flexible Shaft Co. Special automobile machinery, flexible shaftings.
Taylor Co., N. & G.—308 Chestnut St. Steel sheets, pig lead, pig tin, steel billets.
Tiel & Co., Geo.—413 Arch St. Cloth and carpet trimmings.
Universal Clutch Co.—226 S. 11th St. Clutches.
Way Muffler Co., The.—23d and Arch Sts. Mufflers.
Wetherill Finished Castings Co.—Office, 12th and Cumberland Sts.; factory, Richmond St. and Erie Ave. Aluminum and bronze castings.
White Dental Mfg. Co. Flexible shafting.

PENNSYLVANIA—Phila. (Continued)

Wilson Automatic Clock Co. Automobile clocks.
Publications.
Carriage Monthly.—1006 Arch St.
Cycle & Automobile Trade Journal.—Market and 49th Sts.
Motor Print.—418 Sansom St.
Motor Vehicle Register, The.—227-231 S. 6th St.
Remodeling.
Rudolph, Wm. F.—302 N. Broad St. Repairing.
Renting, Automobile.
South Broad Automobile Co.—729 S. Broad St. (Dorris, Duryea.) Supplies, garage, repairs, electric charging.
Repairing, Automobile.
Adamson, Prescott.—N. W. Cor. Broad and Spring Garden Sts. (Columbia.)
Brazier Auto Works.—38th and Market Sts. (Marmon.) Garage.
Foss-Hughes Motor Car Co.—201 N. Broad St. (Pierce Arrow, Knox, Cadillac, Baker.) Garage, electrical charging.
Gorson's Auto Exchange.—617-619 Arch St. Repairing second-hand cars.
Houpt Co., Harry S.—139 S. Broad St. (Thomas Flyer.) Garage.
North Philadelphia Auto Station.—3425 N. Broad St.
Northwestern Motor Car Co.—1928-1930 N. 20th St. (Moline.) Garage.
Philadelphia Auto Repair Shop.—230 N. 22d St.
Quaker City Auto Co.—138-146 N. Broad St. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Peerless, Franklin.) Garage.
Reo Motor Car Co. of Philadelphia.—242 N. Broad St. (Reo, Premier.)
Rittenhouse Garage.—214-220 S. 23d St. (American Mercedes, Wayne.) Garage.
Rudolph, Wm. F.—302 N. Broad St. Remodeling.
South Broad Automobile Co.—729 S. Broad St. (Dorris, Duryea.) Supplies, garage, renting, electric charging.
Supplies, Automobile.
Autolight & Motor Supply Co., The.—506-508 N. Broad St.
Gibboney & Bros., Jas. L.—211-213 N. Broad St.
Miller, Chas. E.—318-320 N. Broad St. Manufacturer, jobber, exporter and importer.
Nock Co., Inc., Geo. W.—126 N. 4th St.

PENNSYLVANIA—Phila. (Continued)

South Broad Automobile Co.—729 S. Broad St. (Dorris, Duryea.) Garage. repairing, renting, electric charging.
Vulcanizing, Automobile.
 Ajax Rubber Co. of Philadelphia.—1413 Race St.
 Gibney & Bros., Jas. L.—211-213 N. Broad St.
 Shaw, Frank.—260 N. Broad St.
 Standard Rubber Tire Co.—830 N. Broad St.

PHILIPSBURG—

Automobile Agents and Dealers.
 Andrews, Dr. W. W. (Cadillac.)

PHOENIXVILLE—

Automobile Agents and Dealers.
 Rhodes, Lewis F. (Simplicity.)
Garages.
 Erb, John.—345 Bridge St.
 Shaffer, R. G.—203 Bridge St.
Parts and Accessories Manufacturers.
 Logan Mfg. Co. Steel castings.
 Phoenix Iron Co. Bar iron and steel.

PINEGROVE—

Automobile Agents and Dealers.
 Smith, Harry (Rambler.)

PITTSBURGH—

Clubs and Associations.
 Automobile Club of Pittsburgh.—Paul C. Wolff, Sec.; Baum and Beatty Sts.
 Automobile Dealers' Ass'n of Pittsburgh.
Automobile Agents and Dealers.
 Allegheny Auto Co. (Austin, Glide, Rapid.)
 American Automobile Co.—5928 Baum St., E. E. (Pope-Toledo, Pope-Hartford, Pope-Waverley.)
 Arlington Motor Car Co.—5971 Center Ave. (Acme, Jackson.)
 Atlas Automobile Co.—College and Ellsworth Ave. (Premier, Chadwick, Maxwell.)
 Auto Repair Co.—559 7th Ave. (Corbin, Haynes.)
 Banker Bros. Co.—Baum and Beatty Sts. (Autocar, Cadillac, Stevens-Duryea, Pierce.)
 Bellefield Motor Co.—4518 Henry St. (De Luxe, Queen, Pennsylvania.)
 Benson, B. F.—1311 Keystone Bldg. (American Mercedes, Rainier.)
 Brown, W. B. (Dragon.)
 Central Automobile Co.—5989 Center Ave. (Reo.)
 Collins & Co., D. P.—432 7th Ave. (Columbia.)
 Colonial Automobile Co.—5518-5520 Walnut St. (Aerocar, Cleveland, Pungs-Finch, Baker, Cartecar, Brazier.)
 Dragon Car Co.—620 Maryland Ave. (Dragon.)

PENNSYLVANIA—Pittsburgh (Cont.)

Excelsior Poultry & Provision Co.—69 Franktown Ave. (Waltham.)
 Fort Pitt Automobile Co.—Baum St. and Euclid Ave. (Stearns, Locomobile, Oldsmobile.)
 Godley, Harry.—3780 Highland Ave. (Matheson.)
 Hamilton Auto Co.—206 N. Broad St. (Stoddard-Dayton.)
 Hiland Automobile Co.—5811-5817 Center Ave. (Peerless, Buick.) Garage, repairing.
 Homewood Automobile Co.—7250 Kelly St., E. E. (Frayer-Miller.)
 Iams Automobile Co.—5986 Center Ave. (Royal.)
 Johnston, Chas. M.—232 5th Ave. (American Mors.)
 Keystone-Auto Co.—5905 Center Ave., E. E. (Stoddard-Dayton, Welch, Ford, Columbus, White.)
 Knowalsky, J. (Gale.)
 Liberty Automobile Co.—138 Beatty, E. E. (Wayne, National, Mitchell, Mora.)
 McNary Co., J. E.—1606 Machesney Bldg. (Studebaker.)
 Martin, L. G.—3923 Forbes St. (Rambler.)
 Matheson Agency. (Berliet, Matheson.)
 Nevin, Ernest D.—1118 Farmers Bank Bldg.—507 Wood Ave. (Darracq.)
 Penn Automobile Co. (Crawford, Marmon.)
 Pittsburg Auto Co.—2213 Farmers' Bank Bldg. (Thomas Flyer.)
 Pittsburg Motor Vehicle Co.—Summerlea St. and Ellsworth Ave.
 Rainier Agency.—559 7th Ave. (Rainier.)
 Schellentrager, E. J.—41 Leader Bldg. (Matheson.)
 Schenley Automobile Co.—3994 Forbes St. (Knox.)
 Smith, M. F. (Walter.)
 Snyder Auto Cycle Co. (Pullman.)
 Standard Automobile Co.—5917 Baum St. (Packard, Franklin.)
 State Automobile Co.—Mignonette and Randolph Sts. (Logan, Pullman.)
 Union Automobile Co.—521 Homewood Ave. (Panhard, Renault.)
 Warren, W. A. (Dolson.)
 Warwick & Co., J. G.—5971 Center Ave. (Jewel.)
 Wilkinsburg Automobile Co.—819 Hay St. (Elmore.) Garage.
 Winton Motor Carriage Co. (Winton.)
Automobile Manufacturers, Electric.
 Synnestvedt Machine Co.—4117 Liberty Ave.

PENNSYLVANIA—Pittsburgh (Cont.)

Automobile Manufacturers, Electric Commercial.

Pittsburg Motor Vehicle Co.
Synnestvedt Machine Co.—4117 Liberty Ave.

Automobile Manufacturers, Gasolene.
Belden Auto Transmission Co.—1005 Bessemer Bldg.

Garages.

Auction Co.—9th St.
Auto Traffic Co.—401 Liberty Bldg.
East Liberty Automobile Co.—5969 Center Ave. (Jackson.) Repairing.
Engle, A.—1103 Carson St.
Hiland Automobile Co.—5811-5817 Center Ave. (Peerless, Buick.) Repairing.

Iron City Auto Co.—613 5th Ave.
Larimer, W. G.—5969 Center Ave., E. E.

Park Garage Company.

Reighard, D. P.—Ellsworth and College Ave.

Vehicle Storage Co.—6014 Rodman St.
Wilksburg Automobile Co.—819 Hay St. (Elmore.)

Motorcycle Agents and Dealers.

Duquesne Cycle Co. (Indian.)

Publications.

Pennsylvania Motor Federation.

***Parts and Accessories Manufacturers.**

Aluminum Company of America. Aluminum.

American Aluminum Coating Co.—100 Diamond Bank Bldg. Aluminum coated steel sheets.

American Steel Hoop Co. Angle, channel and tee iron and steel, bar iron and steel.

American Vanadium Co.—Frick Bldg. Vanadium metals.

Armstrong Cork Co.—23d St. and A. V. Ry. Carbureters, floats, washers.

Baker Mfg. Co., Jas. H.—503 Park Bldg. Drop forgings.

Bankers Bros. Co.—Baum and Beatty Sts. Wind shields, cape tops, limousine bodies.

Best Mfg. Co. Pipe, brass fittings.

Byers & Co., A. M. Wrought iron and steel pipe.

Canonsburg Iron & Steel Co. Sheet iron and steel.

Carnegie Steel Co. Iron and steel, angle, channel and tee and bar iron and steel.

Cleano's Co.—Fulton Bldg. Auto body polishes and soaps.

Columbia Bridge Co. Iron and steel bars, steel shafting.

Crucible Steel Co. of America.—Empire Bldg. Bar iron and steel.

Diamond Rubber Co.—16 Wood St. Tires.

PENNSYLVANIA—Pittsburgh (Cont.)

Duff Mfg. Co. Jacks.

Electric Storage Battery Co.—Frick Bldg. Annex. Sales office.

Eureka Nut Lock Co.—32d and Smallman Sts. Nut locks.

Firestone Tire & Rubber Co.—5904 Penn Ave. Tires.

Gem Mfg. Co.—Spruce, nr. 33d St. Buffing machines, drilling machines, oil cans, flexible shaftings.

Hussey & Co., C. G. Sheet and rod brass and copper.

Jones & Laughlin Co. Steel.

Macbeth-Evans Glass Co. Lamp reflectors.

Mackintosh, Hemphill & Co. Steel castings.

Mansfield Mfg. Co. Pipe, brass fittings.

Mesta Machine Co. Malleable iron and steel castings.

Morris & Bailey Steel Co.—German Nat'l Bank Bldg. Steel.

National Casket Co. Lap robes, raincoats, automobile heaters.

Nuttall Co., R. D.—Fayette St. and Garrison Way. Differential gears, transmission gears, rawhide wheels.

Pittsburg Automatic Vise & Tool Co.—Wabash Bldg. Vises, plumbing and steam fitting machinery.

Pittsburg Brass Mfg. Co.—3153 Penn. Ave. Brass, bronze, aluminum and copper castings, machine work to order.

Pittsburg Gauge & Supply Co.—309 Water St. Pressure gauges, stampings, safety valves, water alarms and columns.

Pittsburg White Metal Co.—3116-3118 Penn Ave. Babbitt metals.

Republic Rubber Co.—106 Market St. Tires.

Seamless Tube Co. of America.—Frick Bldg. Steel tubing.

Shelby Steel Tube Co. Axles, steel tubing.

Spang, Chalfant & Co. Wrought iron and steel pipe, steel tubing.

Standard Sanitary Mfg. Co. Pipe and brass fittings.

Standard Underground Cable Co. Insulated wire.

Thompson Co., E. J.—5917-5919 Penn Ave. Wood and metallic bodies.

United States Tube & Iron Co. Wrought iron and steel pipe.

Valve & Fittings Co. Pipe, brass fittings.

Vestal Shock Absorber Co. Shock absorbers.

Westinghouse Air Brake Co. Air compressors.

PENNSYLVANIA (Continued)

Westinghouse Electric & Mfg. Co.—
Ammeters, voltmeters, charging apparatus, electric controllers, electric generators, electric motors.

Repairing, Automobile.

East Liberty Automobile Co.—5969
Center Ave. (Jackson.) Garage.

Hiland Automobile Co.—5811-5817
Center Ave. (Peerless, Buick.) Garage.

Independent Auto Co.—5989 Center
Ave.

Supplies, Automobile.

Woodwell Co., Jos.—201 Wood St.

Vulcanizing.

Auto Tire & Repair Station.—5918
Baum St.

Pittsburg Auto Tire Co.—Baum and
Whitfield Sts.

PLYMOUTH—

Automobile Agents and Dealers.

Reese Mch. & Tool Wks., S. (Iam-
bert.)

POCONO LAKE—

Automobile Agents and Dealers.

Herrick, A. E. (Elmore.)

PORT ALLEGANY—

Automobile Agents and Dealers.

Wallace, G. S. (Maxwell.)

POTTSTOWN—

Automobile Agents and Dealers.

Vanderslice, C. M.—185 Hanover St.
(Cadillac.)

Garages.

Good, D. B.

Motorcycle Manufacturers.

Light Mfg. Foundry Co.—509 Queen St.

Mayo Damper Co.—355 Walnut St.

Parts and Accessories Manufacturers.

Light Mfg. & Foundry Co.—509 Queen
St. Brass, bronze and aluminum
castings.

Mayo Damper Co.—355 Walnut St.
Carbureters, brass, bronze, alumi-
num and copper castings.

POTTSVILLE—

Automobile Agents and Dealers.

Gorman, J. H. (Maxwell.)

PUNXSUTAWNEY—

Automobile Agents and Dealers.

Harl, John C. (Maxwell.)

RAILROAD, YORK COUNTY—

Automobile Agents and Dealers.

Schroeder, H. (Reo, Premier, Pull-
man.) Garage, repairing.

Garages.

Schroeder, H. (Reo, Premier, Pull-
man.) Repairing.

Repairing, Automobile.

Schroeder, H. (Reo, Premier, Pull-
man.) Garage.

PENNSYLVANIA (Continued)

READING—

Automobile Agents and Dealers.

Berks Auto & Garage Co.—Cherry,
above 5th St. (Jackson, Maxwell.)

Hoffer & Sons, D. B.—126 S. 10th St.
(Logan, Pullman, Queen, De Luxe.)

Penn Automobile Co.—33 Wood St.
(Thomas Flyer.)

Reading Automobile Co.—26 S. 5th St.
(Peerless, Franklin, Buick, Oldsmo-
bile, Pope-Waverley.) Garage, re-
pairing.

Relay Motor Car Co.—1712 N. 10th St.
(Relay.)

Xander Machine & Supply Co.—926
Bingaman St. (Stevens-Duryea,
Stanley, Cadillac, Buick.) Repairing,
Garage.

Youse, Ed.—46 N. 5th St. (Reo,
Rambler, Premier. Repairing, gar-
age.

Automobile Manufacturers, Gasolene.

Acme Motor Car Co.—8th and Elm Sts.

**Automobile Manufacturers, Gasolene
Commercial**

Acme Motor Car Co.—8th and Elm Sts.

Automobile Manufacturers, Steam.

Boss Knitting Machine Works.

Garages.

Acme Motor Co.—302 W. 8th St.

Beihl's Carriage Works.

Heckler, C. T.—222 Penn St.

Reading Automobile Co.—26 S. 5th St.
(Peerless, Franklin, Buick, Oldsmo-
bile, Pope-Waverley.) Repairing.

Xander Machine & Supply Co.—926
Bingaman St. (Stevens-Duryea,
Stanley, Cadillac, Buick.) Repairing.

Youse, Ed.—46 N. 5th St. (Reo, Ram-
bler, Premier.) Repairing.

Motorcycle Agents and Dealers.

Neubling, John G.—8843 Penn Ave.
(Indian.)

Motorcycle Manufacturers.

Reading Standard Cycle Mfg. Co.

Parts and Accessories Manufacturers.

American Die & Tool Co. Transmis-
sion gears, machine works, gasolene
automobile motors.

Carpenter Steel Co. Crank shafts,
drop forgings, steel and chrome
nickel steel.

Duryea, Chas. E. Carbureters.

Keystone Wagon Works. Wood and
metallic bodies, hoods, automobile
tops.

Orford Copper Co.—43 Exchange Pl.
Chrome nickel steel.

Parish Mfg. Co.—17th and Chestnut
Sts. Pressed steel frames, stamp-
ings, chrome nickel steel.

Reading Automobile Co.—26 S. 5th St.
Brakes.

Reading Iron Co. Wrought iron and
steel.

PENNSYLVANIA (Continued)

Reading Metal Body Co. Bodies.
Yocom Co., A. H. Automobile motors.
Youse, Ed.—46 N. 5th St. Air couplings, timers, drop brakes.

Repairing, Automobile.

Reading Automobile Co.—26 S. 5th St. (Peerless, Franklin, Buick, Oldsmobile, Pope-Waverley.) Garage.

Xander Machine & Supply Co.—926 Bingham St. (Stevens-Duryea, Stanley, Cadillac, Buick.) Garage.

Youse, Ed.—46 N. 5th St. (Reo, Rambler, Premier.) Garage.

RED LION—

Garages.

Maye, C. E.

RIDDLESBURG—

Automobile Agents and Dealers.

Shaw, L. B. (Cadillac.)

RIDGWAY—

Automobile Agents and Dealers.

Smith Co., Ltd., C. H. (Haynes.)

Garages.

Ridgway Auto Co.

ROCHESTER—

Clubs and Associations.

Beaver Valley Motor Club.—Paul H. Baldwin, Sec.

Automobile Agents and Dealers.

Baldwin Bros. Co. (Pope-Hartford.)

Fry, Thomas C. (Haynes.)

Jack, M. L. (Rambler.)

Shugert, G. S.—247 Adams St. (Northern, Rambler, Haynes.)

Parts and Accessories Manufacturers.

Fry Co., T. C. & W. L.—201 Brighton Ave. Spark plugs.

ROXBURY—

Parts and Accessories Manufacturers.

Standard Battery Connection Co.—27 Copeland St. Wire terminals.

ROYERSFORD—

Automobile Agents and Dealers.

Keeley, F. W. (Crawford.)

SABINSVILLE—

Automobile Agents and Dealers.

Beach, J. C. (Buick.)

SAYRE—

Automobile Agents and Dealers.

Sayre Machine & Auto Co.—104 Cross St. (Cadillac.)

SCOTSDALE—

Automobile Agents and Dealers.

Scottdale Automobile Co. (Stearns, Franklin.)

SCRANTON—

Automobile Agents and Dealers.

Conrad Bros.—318-320 Linden St. (Reo, Ford.)

Curt & Adams.—420 Spruce St. (Maxwell.)

Ford, W. M.—1227 N. Washington Ave. (Jackson.)

Gould & Sons, A. R.—415 Linden St. (Thomas, Jewel.)

PENNSYLVANIA (Continued)

Lackawanna Motor Car Co. (Winton.)

Megargel, Ralph G.—913 Olive St. (Elmore.)

Robinson & Adams Co.—522 Spruce St. (Maxwell.)

Schulte, B. W.—2 Lyceum Ave. (Rambler.)

Scranton Garage & Motor Co.—Merchants and Mechanics Bank, 419 Spruce St. (Buick, Cadillac, Franklin, Pope-Toledo, Pope-Hartford.)

Standard Motor Car Co.—419 Linden St. (Autocar, Pierce Arrow.)

Garages.

Scott, Chas. B.—119 Franklin Ave.

Instruction, Automobile.

International Correspondence School.

Motorcycle Agents and Dealers.

Robbing, Edward. (Indian.)

Parts and Accessories Manufacturers.

Bevan, Eben L.—628-629 Connell Bldg. Sales agent Kitsee Storage Battery Co.

Scranton Forging Co. Drop forgings.

SELLERSVILLE—

Automobile Agents and Dealers

Groff, A. C.—Main St. (Rambler.)
Repairing, garage.

Garages.

Groff, A. C.—Main St. (Rambler.)
Repairing.

Repairing, Automobile.

Groff, A. C.—Main St. (Rambler.)
Garage.

SHAMOKIN—

Automobile Agents and Dealers.

Gable, A. M.—18 E. Independent St. (Stanley.)

Leader & Sons, C. C.—9th and Independent Sts. (Maxwell.)

Garages.

Eagle, J. H. & C. K.—Arch St.

Fuhrman & Schmidt.—Commerce St.
Shamokin Novelty Co.

SHARON—

Automobile Agents and Dealers.

Hoffman Hardware Co., Jos. (Elmore.)

Shenango Valley Auto Co. (Mitchell, Maxwell.)

SHEFFIELD—

Automobile Agents and Dealers.

Smith Co., Ltd., C. H. (Haynes.)

SHIPPENSBURG—

Automobile Agents and Dealers.

Funk, Upton. (Monarch.)

SHREWSBURY—

Automobile Agents and Dealers.

Schroeder, H.—Main St. (Reo, Premier, Pullman.) Garage, repairing.

Garages.

Schroeder, H.—Main St. (Reo, Premier, Pullman.) Repairing.

PENNSYLVANIA (Continued)

Repairing, Automobile.

Schroeder, H.—Main St. (Reo, Premier, Pullman.) Garage.

SINKING SPRINGS—

Parts and Accessories Manufacturers.
Pennsylvania Auto Metal Body Mfg. Co. Wood and metallic bodies.

ST. MARYS—

Parts and Accessories Manufacturers.
Stackpole Battery Co. Dry cells, carbons, connectors, voltmeters, ammeters.

SLATINGTON—

Automobile Agents and Dealers.
Warren, Geo. R.—Main St., Middle Alley. (Waltham.)

SMETHPORT—

Garages.

Baker, E. R.

SOUTH BETHLEHEM—

Automobile Agents and Dealers.
Drumbor, Chas. E.—6 W. 3d St. (Ford.)

Kachline, J. C. (Cameron.)

Garages.

Wilson, C. A.—Market and High Sts.
Parts and Accessories Manufacturers.
Bethlehem Steel Co. Steel castings, drop forgings, pressed steel frames, steel, chrome-nickel steel.

SPRING CITY—

Garages.

Heck, H. A.—119 Main St.

STEELTON—

Parts and Accessories Manufacturers.
Pennsylvania Steel Co. Angle, channel and tee iron and steel.

STRAIGHT—

Automobile Agents and Dealers.
Quinn & Co., T. H. (White.)

STROUDSBURG—

Automobile Agents and Dealers.
Piper, L. W.—310 Main St. (Dragon, Reo, Compound.)
Stone Automobile Co.—1009 Main St. (Cadillac.)

Garages.

Monroe Garage Co.
Schroeder, G. H.

SUNBURY—

Automobile Agents and Dealers.
Shipman, Ralph. (Maxwell.)

Garages.

Haines, W. B.—804 E. Market St.

TITUSVILLE—

Automobile Agents and Dealers.
Keystone Auto & Cycle Co. (Pierce Arrow, Thomas, Stevens-Duryea.)
Lambert & Von Tacky.—16 N. Franklin St. (Pierce Arrow, Stevens-Duryea, Buick.) Garage, repairing.

Garages.

Lambert & Von Tacky.—16 N. Franklin St. (Pierce Arrow, Stevens-Duryea, Buick.) Repairing.

PENNSYLVANIA (Continued)

Repairing, Automobile.

Lambert & Von Tacky.—16 N. Franklin St. (Pierce Arrow, Stevens-Duryea, Buick.) Garage.

TOWANDA—

Automobile Agents and Dealers.
Hill, Geo. R.—20 Main St. (Mitchell.)

TYRONE—

Automobile Agents and Dealers.
Gill Electric Co. (Reo.) -
Tyrone Motor Car Co. (Rapid.)

UNIONTOWN—

Automobile Agents and Dealers.
Fayette Automobile Co.—76 E. Fayette St. (White, Peerless, Reo, Holsman.) Garage, repairing.
Johnson, C. W. W.—Peter St. (Franklin, Pope.)

Garages.

Fayette Automobile Co.—76 E. Fayette St. (White, Peerless, Reo, Holsman.) Repairing.

Repairing, Automobile.

Fayette Automobile Co.—76 E. Fayette St. (White, Peerless, Reo, Holsman.) Garage.

VANDERGRIFT—

Clubs and Association.

Vandergrift Automobile Club.—E. L. Hoofring, Sec.—172 Franklin Ave.

VERONA—

Garages.

Kowalsky, J.

Parts and Accessories Manufacturers.
Kowalsky Engine Co., J. Marine and stationary gasoline motors.

WARREN—

Automobile Agents and Dealers.
Schlosser, R. J.—25 E. Pennsylvania Ave. (Cadillac, Winton.)
Smith Co., C. H. (Haynes.)

Parts and Accessories Manufacturers.
Jacobson Machine Mfg. Co. Air compressors.

Warren Axle & Tool Co. Wrenches.

WASHINGTON—

Automobile Agents and Dealers.
Washington Automobile Co.—67-69 E. Maiden St. (Franklin.)

Garages.

Pope Automobile Co.

WAYNESBORO—

Parts and Accessories Manufacturers.
Landis Tool Co. Special automobile machinery.
Emmert Mfg. Co. Gray iron castings, vices.

WAYNESBURG—

Automobile Agents and Dealers.
Hartley, C. H. (Maxwell.)

WEST BETHLEHEM—

Garages.

Wright, H. E.—11 S. Main St.

PENNSYLVANIA (Continued)

WESTCHESTER—

Automobile Agents and Dealers.

Black, S. C.—222 N. Church St. (Rambler.)

Glenny, Walter R.—20 W. Bernard St. (Cadillac.)

Hooper, Henry R. (Elmore.)

Slack, Morris B. (Ford.)

Westchester Garage.—118 W. Main St. (Autocar, Winton.)

Garages.

Mayer & Eachus.—109 Market St.

Parts and Accessories Manufacturers.

Hoopes Bros. & Darlington. Wood wheels.

WILKESBARRE—

Clubs and Associations.

Wilkesbarre Automobile Club.—125 S. Washington St.

Automobile Agents and Dealers.

Auto Machine & Repair Co.—176 S. Main St. (Winton.)

Boswell & Co.—25 N. Franklin St. (Jackson.)

Johnston, R.—12 N. Main St. (Reo, Rambler, Maxwell, Knox.)

Matheson Motor Car Co. (Matheson.)

Wyoming Valley Motor Car Co.—35 N. Washington St. (Buick, Locomobile, Cadillac, Pope-Waverley.)

Automobile Manufacturers, Gasoline.

Matheson Motor Car Co.

Garages.

Schulte, G. W.—Wyoming and W. Market Sts.

Parts and Accessories Manufacturers.

Hazard Mfg. Co. Insulated wire.

Sheldon Axle Co. Springs, axles.

WILKINSBURG—

Clubs and Associations.

Automobile Club of Wilkesburg.—Dr. W. C. Cook, Sec.; 415 Center St.

Automobile Agents and Dealers.

Newell, Jas. R.—819 Hay St. (Elmore.)

Pennsylvania Automobile Co.—Hay St. and Kelly Ave. (Crawford, Marmon.)

WILLIAMSPORT—

Clubs and Associations.

Williamsport Automobile Club.

Automobile Agents and Dealers.

Hamill, W. D.—601 W. 3d St. (Baker.)

Holmes & Childs Motor Co.—335 W. 3d St. (Winton, Pope-Toledo.)

Kaufman, Clyde B.—247 W. 3d St. (Ford.)

Keeler & Co., E.—253 W. 3d St. (Cadillac, Buick, Thomas, Franklin, Pope-Hartford, Pope-Waverley.)

Garage, repairing.

Larzelere Machine Co.—613 W. 3d St. (Lambert.)

PENNSYLVANIA (Continued)

Williamsport Auto Exchange.—599 W. 3d St. (Maxwell, Premier, White.)

Young, Geo. H.—814 Hepburn St. (Baker.)

Garages.

Keeler & Co., E.—253 W. 3d St. (Cadillac, Buick, Thomas, Franklin, Pope-Hartford, Pope-Waverley.)

Repairing.

Stutzman, Clyde.—1061 Vine St.

Motorcycle Agents and Dealers.

Connor, B. F.—S. Main St. (Indian.)

Parts and Accessories Manufacturers.

Darling Pump & Mfg. Co. Pipe, brass fittings.

Repairing, Automobile.

Keeler & Co., E.—253 W. 3d St. (Cadillac, Buick, Thomas, Franklin, Pope-Hartford, Pope-Waverley.)

Garage.

WYOMISSING—

Garages.

Cadillac Auto Station.

YORK—

Automobile Agents and Dealers.

Kraft & Co., E. L.—241 S. George St. (Maxwell.)

Meyers, J. P.—500 St. George St. (Rambler.)

Motter, Chas. E. (Stanley.)

Oden Auto Co., J. P.—26 W. Philadelphia St. (Mitchell.)

Pfieffer, T. S. (Jewel.)

Richley, J. W.—29 S. Beaver St. (Cadillac, Franklin, Winton.)

Schroeder, H.—229-231 W. Market St. (Reo, Premier, Pullman.)

Garage, repairing.

Snyder Automobile Co.—229 W. Market St. (Baker, Pope-Toledo, White.)

Automobile Manufacturers, Gasoline.

York Motor Car Co.—240 N. George St.

Garages.

Reiff, Frank H.—16 N. Beaver St.

Schroeder, H.—229-231 W. Market St. (Reo, Premier, Pullman.)

Repairing.

Parts and Accessories Manufacturers.

Norway Iron & Steel Co. Malleable iron castings, steel, iron castings.

York Electric & Machine Co.—30-34 N. Penn St. Wrenches.

York Wagon & Gear Co. Wood and metallic bodies.

Repairing, Automobile.

Schroeder, H.—229-231 W. Market St. (Reo, Premier, Pullman.)

Garage.

PORTO RICO

GUAYAMA—

Automobile Agents and Dealers.

Pales, D. W. (Wayne.)

Garages.

Pales, D. W. (Wayne.)

PORTO RICO (Continued)

MAYAGUEZ—

Automobile Agents and Dealers.
Bravo, Oscar F. (Oldsmobile.)

SAN JUAN—

Automobile Agents and Dealers.

Dooley Smith & Co. (Reo.)

Hamill, Colonel. (Franklin.)

Insular Auto Co. (Knox.)

Wulf, W. J. (Thomas Flyer.)

Garages.

Arnold, E. L.

Hodges, H. B.

Parts and Accessories Manufacturers.

Ajax-Grieb Rubber Co. Tires.

RHODE ISLAND

BRISTOL—

Motorboat Manufacturers.

Herreshoff Mfg. Co.

Parts and Accessories Manufacturers.

National Indian Rubber Co. Storm aprons, curtains, collapsible buckets, inner tire tubes, tire tools, tire tape, cloth and carpet trimmings, insulated wire.

Repairing, Automobile.

Heustis, Thos.

CENTRAL FALLS—

Garages.

Brassard, Joseph.—119 Lincoln St.

Crook, Frank.—386 High St.

EAST GREENWICH—

Motorboat Manufacturers.

Nock, F. S.

EDGEWOOD—

Automobile Agents and Dealers.

Edgewood Auto Co.—376 Smith St. (Northern.)

HILLSGROVE—

Parts and Accessories Manufacturers.

Rhode Island Malleable Iron Works.

Malleable iron castings.

NARRAGANSETT—

Garages.

Burns, Bert A.

Church & Caswell.

Colonial Garage. Repairs, supplies.

Repairing, Automobile.

Colonial Garage. Garage, supplies.

Supplies, Automobile.

Colonial Garage. Garage, repairs.

NEWPORT—

Automobile Agents and Dealers.

Clark, J. M.—Casino Terrace. (Dolson, Mercedes.)

Conroy, Phillips R.—39 Annandale Road. (Columbus.)

Owen, Thos. G.—379 Thomas St. (Rambler.)

Smith, Geo. W. (Maxwell.)

Garages.

Bull, Henry, Jr.—72 Bull St.

RHODE ISLAND (Continued)

Dickson, J. D.—113 Bellevue Ave.

Marlborough St. Auto Exchange.—6 Marlborough St.

Newport Engineering Works.—359-365 Thames St. Repairing, supplies.

Newport Mfg. Co.—18 Baptist St.

New York Auto Repository.—Ocean House Stables.

Pope Motor Car Co.—Casino Terrace. Repairs, supplies.

Reagans, John T.—S. Baptist St.

Parts and Accessories Manufacturers.

Morgan B.—Old Beach Road. Hose couplings, inlet valves, check valve.

Rental Service.

New York Transportation Co.—19 Downing St.

Repairing, Automobile.

Newport Engineering Works.—359-365 Thames St. Supplies, garages.

Pope Motor Car Co.—Casino Terrace. Garage, supplies.

Supplies, Automobile.

Newport Engineering Works.—359-65 Thames St. Garage, repairing.

Pope Motor Car Co.—Casino Terrace. Garage, repairing.

PAWTUCKET—

Automobile Agents and Dealers.

Linton, A. M.—173 N. Bend St. (Jackson.)

Garages.

Spencer, H. L.—5 N. Main St.

Parts and Accessories Manufacturers.

Potter & Johnston Machine Co. Special automobile machinery, vises.

PHENIX—

Automobile Agents and Dealers.

Spencer, C. H. (Waltham.)

PROVIDENCE—

Clubs and Associations.

Rhode Island Automobile Club. Elliot Flint, Sec. Crown Hotel.

Automobile Agents and Dealers.

Allen, J. A.—372 Smith St. (Northern.)

Baldwin, L. F. N. (Stanley.)

Central Auto Exchange.—71 Fountain St. (Monarch, National, Wayne.)

Clark, James M.—134 Washington St. (Mercedes.)

Crane Auto & Garage Co. (Atlas.)

Dauer Auto Co.—24 Richmond St. (Franklin.)

Davis Automobile Co., Inc.—7 Dorrance St. (Winton, Thomas Flyer, Peerless, Locomobile, Oldsmobile, Cadillac, Darracq.) Supplies, garage, repairs.

Dragon Automobile Agency.—87 Weybosset St. (Dragon.)

East Side Automobile Station.—Westminster St. (Pennsylvania.)

Fiske Auto Co.—167 Pine St. (Buick.)

RHODE ISLAND (Continued)

Flint Motor Car Co.—212 Union St. (Packard.)
 Foss-Hughes Motor Car Co.—512 Industrial Trust Building. (Pierce Arrow, Knox.)
 Greenleaf, G. G. (Springfield.)
 Harris Steam Engine Co., W. A.—Park and Promenade Sts. (Mitchell, Berkshire.)
 Hughes Co., The.—Wm. Bough and Dyke Sts. (Reo, Premier.)
 Lee, Arthur S.—52 Richmond St. (Royal.)
 Martin & Co., H. G.—179 Aborn St. (Rapid.)
 Max Motor Car Co.—13 Dorrance St. (Maxwell.)
 New England Automobile Co.—26 Market Sq. (Second-hand cars.)
 Nock Auto Co.—141 Dyer St. (Stoddard-Dayton.)
 O'Brien, M. R.—22 Wood Ave. (Dolson.)
 Pugh Bros.—15 Snow St. (Corbin, Elmore.)
 Rhode Island Motor Car Co.—69 Broad St. (Pope-Hartford, Franklin.)
 Shepard Co. (Columbia.)
 Snow Automobile Co.—86 Dorrance St. (Stevens-Duryea.)
 Standard Investment Co.—4 Weybosset St. (Pennsylvania.)
 Taft & Co., W. E.—150 Broadway. (Glide.)
 Thomas & Lowe Machinery Co.—Sabin and W. Exchange Sts. (Autocar, Pope-Toledo.)
 Wheelwright, Geo. F.—488 Broad St. (Lambert.)
 White Auto Co.—11 Dorrance St. (White.)
 Whitten Motor Car Co.—Broad and Potter Sts. (Rambler.)
Automobile Manufacturers, Gasolene.
 American Locomotive Automobile Co.—Kinsley Ave.
Garages.
 American Locomotive Auto Co.—Hemlock and Valley Sts.
 Auto Exchange.—7 Reservoir Ave.
 Automobile Exchange & Supply Co.—18 Sabin St.
 Battery, F. E.—357 Fountain St.
 Chase Auto Co.—201 Pitman St.
 Davis Automobile Co., Inc.—7 Dorrance St. (Winton, Peerless, Locomobile, Oldsmobile, Cadillac, Darracq, Thomas Flyer.) Repairing, supplies.
 Dean & Co., John M.—793 Westminster St.
 Goodwin Tate Auto Co.—18 Sabin St.
 Harson Auto Co.—212 Union St.
 Park Brew Co.—1100 Elmwood Ave.
 Parker, E. J.—428 Broad St.

RHODE ISLAND (Continued)

Parkers Trinity Square Garage.—428 Broad St.
 Providence Auto Garage.—Broad St. and Potter Ave.
 Providence Motor Car Co.—48 Custom House St.
 Rhode Island Second-Hand Automobile Register.—7 Dorrance St.
 Seymour, Walter F.—536 Atwells Ave.
 Spencer, Edwin C.—4 Mantic Ave.
 Suddard Motor Cycle Co.—58 Warren St.
 Thompson Auto Co.—1924 Westminster St.
 Upper Automobile Co.—35 Clifford St.
 White Automobile Station.—26 Sabin St.
Motorboat Manufacturers.
 Chase Yacht & Eng. Co.
Motorcycle Agents and Dealers.
 Swenson, B. A.—185 Prairie St. (Merkel, Indian.)
Motorcycle Manufacturers.
 Suddard, Wm. A.—10 Bellevue Ave.
Parts and Accessories Manufacturers.
 Alger Laboratories. Anti-freezing solutions.
 American Ball Co.—Eagle St. and Kingsley Ave. Steel balls, brass balls, bearing and thrust bearings.
 American Electrical Works. Insulated wire.
 American Enamel Co. Enamel.
 Beaman & Smith Co., The. Special automobile machinery.
 Bliss Chester Co.—31 Mathewson St. Duplex wire terminals and flexible battery connectors.
 Bourn Rubber Co. Insulated wire.
 Brown & Sharp Mfg. Co. Special automobile machinery circulation pumps.
 Bullard Automatic Wrench Co. Wrenches.
 Chase Motor Co.—201 Pitman St. Marine motors.
 Coleman & Sons, Walter.—300 S. Water St. Marine motors.
 Corliss Engine Works.—Drop forgings.
 Dover Co., Geo. W.—80 Clifford St. Screw machine products.
 Dunton & Co.—55 Atlantic Ave. Soldering paste, armature tapes, insulating paper.
 Field Co., Chas. H.—230 Chestnut St. Special automobile machinery.
 Goodson Electric Ignition Co. Magnetos and ignition dynamos.
 Graham Mfg. Co. Vises.
 Harris Oil Company, A. W.—320 Water St. Grease, oils, semi-solid oils, metal polishes.
 Holt & Co., N. H.—95 Pine St. Machine works to order, screw machine products, screws.
 Jager Gas Engine Co.—33 Canal St. Marine motors.

RHODE ISLAND (Continued)

Mechanical Fabric Co. Cushions.
Morse, R. F.—74 Weybosset St. Gas-
kets.

Providence Brass Foundry & Machine
Co. Brass, bronze, aluminum and cop-
per castings, bronze metals.

Providence Steel Castings Co.—164 Al-
lens Ave. Steel castings.

Rhode Island Machine Co.—Machine
works to order.

Standard Carbureter Co., Inc. Carbu-
reters.

United Wire & Supply Co. Brass and
copper tubing, silver solder.

White, Sam B.—91 Sabin St. Valve
lifters.

Wilcox, N. E. Wood and metallic
bodies.

Publications.

New England Automobile Journal.

Repairing, Automobile.

Davis Automobile Co., Inc.—7 Dorrance
St. (Winton, Cadillac, Peerless, Loco-
mobile, Darracq, Oldsmobile, Thom-
as Flyer.) Supplies, garage.

Supplies, Automobile.

Davis Automobile Co., Inc.—7 Dorrance
St. (Winton, Peerless, Locomobile,
Oldsmobile, Cadillac, Darracq,
Thomas Flyer.) Garage, repairs.

TIVERTON—

Automobile Agents and Dealers.

Barker, E. L. (Maxwell.)

WESTERLY—

Garages.

Smith's Auto Garage.—89 Main St.

Westerly Garage, The.—88 Main St.
Repairing, supplies.

Parts and Accessories Manufacturers.

Safford Mfg. Co., W. F. Marine motors.

Repairing, Automobile.

Westerly Garage, The.—88 Main St.

Supplies, garage.

Supplies, Automobile.

Westerly Garage, The.—88 Main St.
Garage, repairs.

WOONSOCKET—

Garages.

Darling, E. R.—138 Main St.

Robinson, W. A.—56 Prospect St.

Parts and Accessories Manufacturers.

Fortin Tool Co., B. P.—227 N. Main St.
Special automobile machinery.

Getchell & Sons., S. T. Tanks, storage
tanks.

Taft, Pierce Co. Machine works to
order.

SOUTH CAROLINA

ALCOLN—

Automobile Agents and Dealers.

Alderman & Son., D. W. (Cadillac.)

ANDERSON—

Garages.

Anderson Automobile Co.

SOUTH CAROLINA (Continued)

CHARLESTON—

Automobile Agents and Dealers.

Army Cycle Mfg Co.—130-132 Meeting
St. (Buick.)

Charleston Motor Co.—161 Meeting St.
(Reo, Premier.)

Jeffords, J. B. W. (Maxwell, Waltham.)

Waverley Electric Auto Co. (Pope-
Waverley.)

CHESTER—

Garages.

Carpenter, J. C.

COLUMBIA—

Automobile Agents and Dealers.

Carolina Garage Co.—1216 Plain St.
(Rambler, Northern.)

McMaster, S. B. (Pope-Hartford.)

DILLON—

Garages.

O'Farrell, C. F., Jr.

FLORENCE—

Automobile Agents and Dealers.

McLeod, F. N.

GREENVILLE—

Automobile Agents and Dealers.

Bates Taunahill Co. (Buick, Cadillac,
Franklin, Oldsmobile.)

Greenville Automobile Co. (Reo.)

LAURENS—

Automobile Agents and Dealers.

Irby, R. V. (Maxwell.)

McDaniels, S. C. (Waltham.)

ROCK HILL—

Automobile Agents and Dealers.

McFadden, Brown. (Waltham.)

SPARTANBURG—

Automobile Agents and Dealers.

Layton, W. C. (Waltham.)

Garages.

Spartanburg Automobile Co.

SUMTER—

Automobile Agents and Dealers.

Ducker, A. C. (Holsman.)

Jenkins, T. B., Jr. (Reo.)

Maçon, C. S. (Cadillac.)

Morse, E. W., Jr. (Buick.) Garage.

Schwerin, J. A. (Northern.)

Garages.

Morse, E. W., Jr. (Buick.)

SOUTH DAKOTA

ABERDEEN—

Automobile Agents and Dealers.

Aberdeen Auto Co. (Cadillac.)

McArthur & Son, John. (Rambler.)

Pinkerton, W. A. (Cartercar.)

Garages.

Case Auto Co.

Sidow, Chas.

SOUTH DAKOTA (Continued)

CAMP CROOK—

Automobile Agents and Dealers.

Sherill & Morgan, Drs. (Cadillac, Waltham.)

COLTON—

Automobile Agents and Dealers.

Dell Rapids Improvement Co. (Rambler.)

FLANDREAU—

Automobile Agents and Dealers.

Simmons & Francis. (Moline, Atlas.)

HURON—

Automobile Agents and Dealers.

Clark, A. E.—4th and Ohio Sts. (Holsman.) Garage.

Hanson, N. R. (Jackson.)

Mager, G. M. (Buick.)

Garages.

Clark, A. E.—4th and Ohio Sts. (Holsman.)

MADISON—

Automobile Agents and Dealers.

Gulstine & Waskey. (Buick.) Repairing, garage.

Garages.

Gulstine & Waskey. (Buick.) Repairing.

Repairing, Automobile.

Gulstine & Waskey. (Buick.) Garage.

PINERIDGE—

Automobile Agents and Dealers.

McIntyre, F. E. (Waltham.)

REDFIELD—

Automobile Agents and Dealers.

Myers, Fred, Sr. (Cadillac.)

Riggs Land Co. (Lambert.)

ROCK HILL—

Automobile Agents and Dealers.

McFadden & Son, V. B., (Maxwell.)

SIOUX FALLS—

Automobile Agents and Dealers.

Fenn Bros.—122-124 E. 10th St. (Packard, Autocar, Buick.)

Sioux Falls Auto & Supply Co.—112-114 N. Main Ave. (Jackson, Rambler, Ford.) Garage and repairing.

Van Brunt Co., Henry H. (Richmond.)

Garages.

McCalmont, A. W.

Sioux Falls Auto & Supply Co.—112-114 N. Main Ave. (Jackson, Rambler, Ford.) Garage.

Repairing, Automobile.

Sioux Falls Auto & Supply Co.—112-114 N. Main Ave. (Jackson, Rambler, Ford.) Garage.

VOLGA—

Automobile Agents and Dealers.

Hymes, Herbert. (Rambler.)

WAGNER—

Garages.

Townley, Dr. R. H.

SOUTH DAKOTA (Continued)

WATERTOWN—

Automobile Agents and Dealers.

Babcock & Lon. (Ford.)

Moe, B. P. (Rambler.)

Garages.

Huff, Ed.

YANKTON—

Automobile Agents and Dealers.

Nyberg, P. J. (Cadillac.)

TENNESSEE

CHATTANOOGA—

Automobile Agents and Dealers.

Chattanooga Auto Co.—Southern Hotel Bldg. (Franklin, Cadillac.)

Fritts Hardware Co., T. (Waltham.)

Joyce Auto Co., F. G.—705 Chestnut St. (Buick, Thomas Flyer.)

Stebbs Auto Co. (Reo, Rambler.)

Wallace Buggy Co. (Stoddard-Dayton, Elmore.)

Parts and Accessories Manufacturers.

American Lava Co.—27-29-33 William St. Burners, spark plugs, tire talc, cores, insulation.

CLEVELAND—

Automobile Agents and Dealers.

Milne, W. S. (Pope-Waverley.)

COLUMBIA—

Garages.

Blocker, A. L.

GALLATIN—

Automobile Agents and Dealers.

Holder, H. A. (Holsman.)

GREENVILLE—

Automobile Agents and Dealers.

Brown, H. R., care of Brown Mfg. Co. (Haynes.)

KNOXVILLE—

Automobile Agents and Dealers.

Rodgers & Co.—710 Gay St. (Reo, Rambler, Oldsmobile, Pope-Waverley, Rapid.)

Garages.

Wolf, M. L.—710 Gay St. Repairing.

Repairing, Automobile.

Wolf, M. L.—710 Gay St. Garage.

MEMPHIS—

Automobile Agents and Dealers.

Blomberg & Co.; Frank C.—346 Madison St. (Buick, White, Baker.)

McDonald Auto Co. (Holsman, Mitchell.)

Memphis Auto Co. (Thomas Flyer.)

Parker Co., J. P.—46-48 S. 2nd St. (Stoddard-Dayton.)

White, H. A. (Cadillac.)

NASHVILLE—

Automobile Agents and Dealers.

Chester Co., Jno. W.—114 3rd Ave. (Lambert.)

Demonbreun, B. R.—113 Public Square. (Autocar.)

TENNESSEE (Continued)

Hermitage Auto Co., The.—170 3rd Ave.
(Stevens-Duryea.)
Keith, Simmons & Co.—310 Union St.
(Mitchell.)
Nashville Motor Car Co.—Cor. Church
St. and 9th Ave. (Stanley, Dorris.)
Garage, repairing.
Roler, J. S.—171-181 3rd Ave. N.
(Rambler.)
Southern Automobile Co.—168 N. Col-
lege St. (Buick, Cadillac, Oldsmo-
bile, Stanley, Pope-Toledo.)
Yowell, Jas. E. (Moon.)
Garages.
Anderson Auto Co.—314 4th Ave. N.
Bell, B. T.—166 Third St., N.
Ezell Automobile Co.
Heck, Chas.
Nashville Motor Car Co.—Cor. Church
St. and 9th Ave. (Stanley, Dorris.)
Repairing.
Thomas, J. Clarence.—Beaton and Col-
lins Sts.
Parts and Accessories Manufacturers.
Hager Carburetter Co.—819 Broadway.
Carbureters.
National Casket Co. Lap robes, rain
coats, automobile heaters.
Repairing, Automobile.
Nashville Motor Car Co.—Cor. Church
St. and 9th Ave. (Stanley, Dorris.)
Garage.

TEXAS

ABILENE—

Automobile Agents and Dealers.
Spalding Bros. (Queen.)

ALPINE—

Automobile Agents and Dealers.
Wilson, Jim P. (Waltham.)

AMARILLO—

Automobile Agents and Dealers.
Morrow Hardware Co., Thomas.
(Northern.)

AUSTIN—

Automobile Agents and Dealers.
Cordz, Henry. (Pungs-Finch.)
Heierman & Bro.—117-123 East 5th St.
(Jewel.) Repairing.
Nale, Ewell.—601-623 East 6th St.
(Thomas, Buick.)
Pierre, Bremond.—107 East 6th St.
(Haynes.)
Radkey, S. B.—Cor. W. 5th and Colo-
rado Sts. (Holsman.)

Garages.

McLellan, A. T.—511 Colorado St.
Repairing, Automobile.
Heierman & Bro.—117-123 E. 5th St.
(Jewel.)

BALLINGER—

Automobile Agents and Dealers.
Creasy, R. B. (Ford.)

TEXAS (Continued)

BEAUMONT—

Automobile Agents and Dealers.
Marine Iron Works. (Maxwell.)

BOERNE—

Garages.
Kuhlmann, Wm.

BROWNWOOD—

Automobile Agents and Dealers.
Hall, E. G.—111 E. Broadway. (Cadil-
lac.) Garage, repairing.

Garages.

Hall, E. G.—111 E. Broadway. (Cadil-
lac.) Repairing.

Repairing, Automobile.

Hall, E. G.—111 E. Broadway. (Cadil-
lac.) Garage.

COMANCHE—

Automobile Agents and Dealers.
Russell, L. B., Jr. (Waltham.)

CORPUS CHRISTI—

Automobile Agents and Dealers.
Clarkson & Oliver.—601-603 Mesquite
St. (Northern, Ford, Rapid, Olds.)
Garage, repairing.

Noakes Bros. (Buick, Cadillac.)

Garages.

Clarkson & Oliver.—601-603 Mesquite St.
(Northern, Ford, Rapid, Olds.) Re-
pairing.

Repairing, Automobile.

Clarkson & Oliver.—601-603 Mesquite
St. (Northern, Ford, Rapid, Olds.)
Garage.

DALHART—

Automobile Agents and Dealers.
Smith, W. E. (Waltham.)

Garages.

Dorris, Duncan A.—155 Spruce St.

DALLAS—

Clubs and Associations.

Dallas Automobile Club, Eugene Corley
Sec.—315 Commerce St.

Automobile Agents and Dealers.

Bettes, O. H.—590 San Jacinto St.
(Mitchell.)

Cameron Auto Co.—369 Commerce St.
(Franklin, Buick, Pope-Toledo.)

Chabot, C. J.—355 Main St. (Elmore.)

Pegues, R. T.—Imperial Hotel. (Lam-
bert.)

Studebaker Bros. Mfg. Co.—317 Elm St.
(Studebaker.)

Thornhill Co., H. W. (Rapid.)

Wheelan, J. D.—cr. Dallas Auto Co.
(Thomas Flyer.)

Garages.

Bensfield, C. R.
Hill Auto Co.

DENTON—

Automobile Agents and Dealers.
Blewett, B. W. (Waltham.)

TEXAS (Continued)

EL PASO—

Automobile Agents and Dealers.

Austin, R. S. (Thomas Flyer.)

Clark, I. G.—616 San Antonio St.
(Holsman.)

El Paso Foundry & Machine Co. (Cadillac.)

Marion, J. I.—519 San Antonio St.
(Waltham.)

Newman Investment Co. (Buick.)

Motorcycle Agents and Dealers.

Marion, J. I.—519 San Antonio St.
(Reading Standard.)

FORT WORTH—

Automobile Agents and Dealers.

Abbott's Garage. (Buick.)

Fort Worth Auto Co.—1422 Penn Ave.
(Elmore, Haynes, Franklin.)

Lewis, H. H. (Rainier.)

Ray-Wortham Automobile Co.—609
Throckmorton St. (Stoddard-Dayton.)

Garages.

Darrough Garage.—613 Throckmorton
St.

FREDERICKSBURG—

Automobile Agents and Dealers.

Ahrleger, F. W. (Waltham.)

GALVESTON—

Automobile Agents and Dealers.

Christenson & Co. (Ford.)

Galveston Motor Car Co. (Rapid.)

HEREFORD—

Automobile Agents and Dealers.

Loyd, Dr. O. H. (Holsman.)

HICO—

Automobile Agents and Dealers.

Rodgers, Ernest. (Waltham.)

HOUSTON—

Clubs and Associations.

Houston Automobile Club., S. E. Bering,
Sec.

Automobile Agents and Dealers.

American Automobile Co. (American.)

Auto & Motor Boat Co.—1205 Capitol
Ave. (Cameron.)

Barden Electric & Machinery Co.—109
Main St. (Rambler, Reo, Mitchell,
Frayer Miller.)

Cox, Wade.—1014 Texas Ave. (Ford.)

Houston Motor Car Co.—Prairie Ave.
and San Jacinto St. (Thomas, Pierce
Arrow, Stevens-Duryea, Stoddard-
Dayton, Cadillac.)

Mosehart & Kellar Co. (Buick.)

Garages.

Vick, V.

LAMPASSAS—

Automobile Agents and Dealers.

Bauman, Frank. (Jewel.)

LUBOCK—

Automobile Agents and Dealers.

Lubock Motor Car Co. (Jackson.)

TEXAS (Continued)

MARLIN—

Automobile Agents and Dealers.

Rush, Gardner & Barlett Co. (Pope-
Hartford.)

MIDLAND—

Automobile Agents and Dealers.

Reid, R. T. (Mitchell.)

Slaughter, R. L. (Buick.)

NEW BAUMFIELD—

Garages.

Henne Co., Louis.

ORANGE—

Automobile Agents and Dealers.

Sabine Supply Co., The. (Cadillac.)

PECOS—

Automobile Agents and Dealers.

Pecos Auto Co. (Acme.)

PLAINVIEW—

Automobile Agents and Dealers.

Ellerd Bros. (Acme.)

Union Automobile & Supply Co.
(Pope-Hartford.)

PORT ARTHUR—

Automobile Agents and Dealers.

Stearns Hdw. Co. (Waltham.)

ROUNDROCK—

Automobile Agents and Dealers.

Nelson & Co., J. A. (Mitchell.)

SAN ANGELO—

Automobile Agents and Dealers.

Findlater Hardware Co. (Holsman.)

Walker, J. G. (Buick.)

Webb, Clarence R. (Cameron.)

SAN ANTONIO—

Clubs and Associations.

San Antonio Automobile Club., C. J.
Overman, Sec.—218 W. Commerce St.

Automobile Agents and Dealers.

Auto Agency & Supply Co. (Waltham.)

Birdsong & Potchernick.—E. Houston
St. (Maxwell.)

Conrad, G. A.—819 Magnolia St. (Reo.)

Cook, H. F.—117 Main St. (Ford,
Reo.)

McElroy & Co., D. W. (De Luxe,
Stoddard-Dayton.)

MacKay Heinen & Co. (Holsman.)

Rees, H. O.—242 W. Commerce St.
(Lambert.)

Robbins, G. D.—Cor. Crocket and Lo-
soya St. (Mitchell.)

Staacke Bros.—133 W. Commerce St.
(Buick, Haynes, Stevens-Duryea.)

Texas Auto Transit Co. (Rapid.)

Garages.

McKay, D.

Texas Automobile Co.

West, W. E.—833 W. Myrtle St.

SEABROOK—

Clubs and Associations.

Seabrook Automobile Club.

TEXAS (Continued)

SEGERIN—

Automobile Agents and Dealers.
McKee, Sam L. (Waltham.)

SNYDER—

Garages.
Chenoweth, W. B.

TAHOHA—

Automobile Agents and Dealers.
Alley & Garner. (Buick.)

TEMPLE—

Automobile Agents and Dealers.
Temple Auto Co. (Holsman, Rapid.)

TEXARKANA—

Automobile Agents and Dealers.
Read, W. K. (Holsman.)

TOYAH—

Automobile Agents and Dealers.
Toyah Rapid Transit Co. (Buick.)

WACO—

Automobile Agents and Dealers.
Hays Bros. (Buick.)
Wortham, W. F. (Maxwell.)

WEATHERFORD—

Automobile Agents and Dealers.
Richards, W. E. (Cadillac.)
Weatherford Electric Co. (Holsman.)

WICHITA FALLS—

Automobile Agents and Dealers.
Blair, Wiley. (Buick.)
Wichita Falls Imp. Co. (Waltham.)

YOAKUM—

Automobile Agents and Dealers.
Clark, J. M. (Waltham.)

UTAH

MURRAY—

Automobile Agents and Dealers.
Miller Cahoon Co. (Pope-Hartford,
Knox.)

OGDEN—

Clubs and Associations.
Automobile Club of Ogden.
Automobile Agents and Dealers.
Becroft, L. H. (Reo.)
Browning Bros. Co.—2461 Washington
Ave. (Mitchell.) Repairing.
Garages.
Ogden Automobile Co.—24th St.
Repairing, Automobile.
Browning Bros. Co.—2461 Washington
Ave. (Mitchell.)

SALT LAKE CITY—

Automobile Agents and Dealers.
Automobile Exchange, The. (Jackson.)
Botterill, Tom.—62 W. 3d St. S.
(Pierce Arrow.)
Coffin, E. C.—330 D. F. Walker Bldg.
(Lambert.)
Consolidated Wagon & Mch. Co.
(Buick, Columbus, Knox, Northern.)
Desert Automobile Co.—71 S. State St.
(Haynes.)

UTAH (Continued)

Francer & Morris. (Maxwell.)
Freed & Branford Automobile Co.
(Wayne.)
Libbey, Frank P. (Lozier.)
Muller Cahoon Co. (Pope-Waverley.)
Nye, John. (Waltham.)
Sharman Automobile Co.—109-111 W.
S. Temple St. (American Mors
Reo, Moline, National, Woods,
Mitchell.)
Stocker, August.—71 S. State St.
(Peerless, Autocar.)
Studebaker Bros. Co. of Utah.—157
State St. (Studebaker.)
Utah Automobile Co.—57 Market St.
(Pope-Toledo.)
Wasatch Auto Co. (Thomas.)
White Savage Auto Co.—43 State St.
(Stearns, Cadillac.)
Motorcycle Agents and Dealers.
League Cycle Store.—325 Southwest
Temple St. (Indian.)

VERMONT

BARRE—

Automobile Agents and Dealers.
Gordon, J. W. (Haynes.)
Prindle, B. A. (Elmore.)
Garages.
Prouty, Geo. H.

BELLOW FALLS—

Automobile Agents and Dealers.
Gates, C. S.—Westminster St. (Ford,
Rambler, Jackson.)
Repairing, Automobile.
Gates' Garage. Supplies.
Supplies, Automobile.
Gates' Garage. Repairs.

BRATTLEBORO—

Clubs and Associations.
Brattleboro Automobile Club.
Automobile Agents and Dealers.
Clark Automobile Co., E. R., The.—
Whetstone Bldg. (Buick, Cadillac,
Knox.)
Manley Bros.—Rear Brooks House.
(Ford, Rambler, Jackson.)
Smith, S. A. & C. A. (Premier.)
Tucker, Geo. (Cartercar.)
Whitney, E. D.—50 Greene St. (Stev-
ens-Duryea.)
Garages.
Henkel Bros.

BURLINGTON—

Automobile Agents and Dealers.
Burlington Machine & Repair Co.—106
Church St. (Stanley.)
Van Ness Garage.—Rear of Van Ness'
House. (Reo, Premier, Rapid.)
Walker, W. K., Mrs. (Elmore.)
Woodbury, C. P. (Cadillac.)

VERMONT (Continued)

Garages.

Collison's Garage.—Cor. Maple and Church Sts. Repairing, supplies.

Parts and Accessories Manufacturers.

Spear Martin Fur Co.—41 Church St. Miscellaneous wearing apparel.

Repairing, Automobile.

Collison's Garage.—Cor. Church and Maple Sts. Supplies, garage.

Supplies, Automobile.

Collison's Garage.—Cor. Maple and Church Sts. Garage, repairs.

ESSEX JUNCTION—

Automobile Agents and Dealers.

Johnson, Walter B. (Buick.)

JONESVILLE—

Automobile Agents and Dealers.

Gillet, F. B. (Cadillac.)

MCINDOES FALLS—

Automobile Agents and Dealers.

Stuart, J. H. (Reo, Premier.) Repairing, garage.

Garages.

Stuart, J. H. (Reo, Premier.) Repairing.

Repairing, Automobile.

Stuart, J. H. (Reo, Premier.) Garage.

MONTGOMERY CENTER—

Automobile Agents and Dealers.

Brown, E. T. (Waltham.)

MONTPELIER—

Automobile Agents and Dealers.

Williams & Son, J. J.—109 Main St. (Buick, Pope-Hartford.)

MORRISVILLE—

Automobile Agents and Dealers.

Campbell, A. R. (Maxwell.)

Rich, H. M. (Pope Line, Cadillac, Jackson.)

Repairing, Automobile.

Morrisville Foundry Co.

NEWPORT—

Automobile Agents and Dealers.

Hinman, B. (Buick.)

NORTH BENNINGTON—

Garages.

White Co., H. C.

RICHFORD—

Automobile Agents and Dealers.

Manuel Bros. (Elmore, Cadillac.)

Whitman, R. H.—Powell St. (Waltham, Stanley, Ford.)

RUTLAND—

Clubs and Associations.

Rutland Automobile Club, Chas. A. Matthews Sec.

Automobile Agents and Dealers.

Frenier & Son, J. H.—Cleveland Ave. (Rambler, Ford.)

Rutland Machine & Automobile Co.—55-61 Wales St. (Buick, Winton,

VERMONT (Continued)

Franklin.) Garage and repairing.

Rutland Motor Co.—76 West St. (Maxwell, Waltham.)

Garages.

Rutland Machine & Automobile Co.—55-61 Wales St. (Buick, Winton,

Franklin.) Repairing.

Repairing, Automobile.

Rutland Machine & Automobile Co.—55-61 Wales St. (Buick, Winton,

Franklin.) Garage.

ST. ALBANS—

Automobile Agents and Dealers.

Perkins, B. B.—Kingman St. (Cadillac, Buick.) Repairing.

Garages.

Fuller, E. D.

Perkins, B. B.—Kingman St. (Cadillac, Buick.) Repairing.

Sabin, C. H.—3 Congress St.

Repairing, Automobile.

Perkins, B. B.—Kingman St. (Cadillac, Buick.) Garage.

ST. JOHNSBURY—

Automobile Agents and Dealers.

Aldrich & Burbank. (Stanley.)

Browne & Wright. (Maxwell.)

Ranlett Automobile Co.—76 Eastern Ave. (Stanley cars.)

Stuart, Hamilton. (Reo.)

Garages.

St. Jock, Joseph.

SPRINGFIELD—

Clubs and Associations.

Automobile Club of Vermont.

WATERBURY—

Garages.

Davis, W. F.—Cor. Main St. and Park Ave.

Parts and Accessories Manufacturers.

Cooley Mfg. Co. Marine motors.

WHITE RIVER JUNCTION—

Automobile Agents and Dealers.

Excelsior Carriage Co.—Main St. (Cadillac, Buick, Stanley.) Garage, repairing, and supplies.

Perkins, F. H. (Cadillac, Stanley, Jackson.)

Garages.

Excelsior Carriage Co.—Main St. (Cadillac, Buick, Stanley.) Repairing, supplies.

Repairing, Automobile.

Excelsior Carriage Co.—Main St. (Cadillac, Buick, Stanley.) Supplies, garage.

Supplies, Automobile.

Excelsior Carriage Co.—Main St. (Cadillac, Buick, Stanley.) Garage, repairing.

WINDSOR—

Garages.

Baker, W. Harris.—Main St.

VIRGINIA

BLACKSBURG—

Automobile Agents and Dealers.
Schultz, J. H. (Ford, Rambler, Logan.)

FARNHAM—

Automobile Agents and Dealers.
Lyell & Co., J. M. (Holsman.)

HARRISONBURG—

Automobile Agents and Dealers.
Wine, E. H. (Rambler.)

LYNCHBURG—

Automobile Agents and Dealers.
Tompkins, Geo. J., Dr.—701 Church St.
(Maxwell.)

NEWPORT NEWS—

Automobile Agents and Dealers.
Miller, Sol. (Jackson.)

NORFOLK—

Clubs and Associations.
Tidewater Automobile Club, Frank
Lewis, Sec.—510 Atlantic Trust Bldg.
Virginia East Coast Associations.
Automobile Agents and Dealers.
Chesapeake Launch & Motor Co. (Frank-
lin.)

Drake, E. J. (Elmore, Cadillac.)
Grover, W. H. (Ford, Reo, Premier,
Maxwell.)

Harmon, A. E.—10th and Granby Sts.
(Mitchell.)

Harmon, K. R.—10th and Granby Sts.
(Waltham.)

O'Neill & Bro., A. A.—City Hall Ave.
and Randolph St. (Rambler.)

Garages.

Norfolk Horse, Carriage & Auto Co.,
Inc.

PULASKI—

Automobile Agents and Dealers.
Gardiner, R. L. (Waltham.)

QUINBY—

Automobile Agents and Dealers.
Brush, A. P. (Cadillac.)

RICHMOND—

Automobile Agents and Dealers.
Blenner, B. A.—508 W. Broad St.
(White, Winton, Dragon, Pierce-Ar-
row.)

Hodge, M. C., Jr., Dr.—308 E. Grace
St. (Maxwell.)

Jenkins Bros.—1607 W. Broad St.
(Pope-Hartford.)

Motor Transfer Co. (Buick, Matheson,
Franklin, Cadillac, Autocar.)

Stagg, Stephen. (Holsman.)

Garages.

Battens Garage.

Virginia Automobile Co.—223 W. Broad
St.

Parts and Accessories Manufacturers.
Enterprise Machine Works.—308 N. 5th
St. Brazers.

Richmond Forging Corp.—Belle Isle St.
Drop forgings, crank shafts, connect-
ing rods, hubs, steering knuckles.

VIRGINIA (Continued)

Richmond Forging Corporation. Trans-
mission gears.

ROANOKE—

Automobile Agents and Dealers.

Roanoke Auto Co., The.—107 Church
St. (Rambler.)

Virginia Motor Car Co. (Maxwell.)

Repairing, Automobile.

Maxwell Bros.—20 Church Ave.

STAUNTON—

Automobile Agents and Dealers.

Baughner, J. L. (Rambler.) Garage and
repairing.

Walter, Frank.—Montgomery Hall. (Au-
tocar.)

Witz, J. L. (Pope-Hartford.)

Garages.

Baughner, J. L. (Rambler.) Repairing.
Repairing, Automobile.

Baughner, J. L. (Rambler.) Garage.

SUFFOLK—

Automobile Agents and Dealers.

Drake Auto Station. (Cadillac.)

Gaskins, R. L. (Maxwell.)

Garages.

Land, H. L.

WASHINGTON

ABERDEEN—

Automobile Agents and Dealers.

Huotari & Co. (Waltham.)

BELLINGHAM—

Automobile Agents and Dealers.

Union Auto Co.—1651 Elk St. (Win-
ton, Cadillac, Autocar.)

EVERETT—

Automobile Agents and Dealers.

Ferrell, A. M.—Cor. Colby and Wash-
ington Sts. (Mason, Ford, National.)
Garage and repairing.

Garages.

Ferrell, A. M.—Cor. Colby and Wash.
Sts. (Mason, Ford, National.) Re-
pairing.

Repairing, Automobile.

Ferrell, A. M.—Cor. Colby and Wash-
ington Sts. (Mason, Ford, National.)
Garage.

NORTH YAKIMA—

Automobile Agents and Dealers.

Clark, Chas. B. (Waltham.)

Yakima Garage & Auto Co. (Cameron.)

OLYMPIA—

Motorcycle Agents and Dealers.

Ashley, W. G. (Indian.)

PORT TOWNSEND—

Automobile Agents and Dealers.

Gleason, E. E., Dr. (Waltham.)

SEATTLE—

Clubs and Associations.

Seattle Automobile Associations.

WASHINGTON (Continued)

Automobile Agents and Dealers.

American Auto Machine Co.—1927 1st Ave. (Mitchell.)

Broadway Automobile Co., Inc.—Madison St. and Broadway. (Pierce Arrow, Autocar, Knox, Cadillac, Wood, Baker, Peerless, Packard.) Repairing. F. A. Wing, Mgr.

Cook Motor Car Co. (Stevens-Duryea.) Erickson, Louis.—1520 Belmont Ave. (Dragon.)

Eureka Motor Co.—1409-11 Broadway. (Dolson, American Mors.)

Hess, J. Archie. (Corbin.)

Kane, M. Francis.—507 Mutual Life Bldg. (Wayne.)

Lewis, L. D. (Frayer-Miller.)

Migliavacca Co.—208 2nd Ave. S. (Glide, Earl.)

Northwest Motor Co.—Broadway and Union St. (White, Columbus.)

Nute & Keena. (Packard.)

Pacific Coast Automobile Co.—1414-1416 Broadway. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Thomas Flyer, Thomas Detroit, Buick, Oldsmobile.) Repairing, garage.

Pacific Commercial Car Co. (Cartecar.) Paige, M. M.—302 Highland Drive. (Lambert.)

Peterson, N. E.—1520 Belmont Ave. (Stearns.)

Poole, C. W.—1423 Tenth Ave. (Cleveland.)

Puget Sound Auto Co.—1405-7 Broadway. (National, Rambler, Commerce.) Garage and repairing.

Queen City Auto Repair Works.—2201-3 Second Ave. (Reliance.)

Queen City Garage, The.—2203-7 2nd Ave. (Apperson.)

Seattle Automobile Co.—1423-10th Ave. (Columbia, Locomobile, Franklin.)

Stearns Auto Agency.—1429 Broadway. (Stearns.)

Wayne Automobile Agency.—507 Mutual Life Bldg. (Wayne.)

Winton Motor Carriage Co.—715 E. Pine St. (Winton.)

Automobile Manufacturers, Gasolene.
Eureka Motor Co.

Garages.

Lane, Louis L.—Broadway nr. Pine St.
Pacific Coast Automobile Co.—1414-16 Broadway. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Thomas Flyer, Thomas, Detroit, Buick, Oldsmobile.) Repairing.

Puget Sound Auto Co.—1405-7 Broadway. (National, Rambler, Commerce.) Repairing.

WASHINGTON (Continued)

Motorcycle Agents and Dealers.

Spinning, F. M.—1310 Second Ave. (Indian.)

Parts and Accessories Manufacturers.
Ajax-Grieb Rubber Co.—1419 Broadway. Tires.

American Portable House Co. Portable houses.

Fisk Rubber Co.—719 E. Pike St. Tires.

Goodrich Co., B. F.—310 First Ave. Tires.

Repairing, Automobile.

Broadway Automobile Co.—Madison St. and Broadway. (Pierce Arrow, Autocar, Knox, Cadillac, Wood, Baker, Peerless, Packard.)

Pacific Coast Automobile Co.—1414-16 Broadway. (Pope-Toledo, Pope-Hartford, Pope-Waverley, Thomas Flyer, Thomas, Detroit, Buick, Oldsmobile.) Garage.

Puget Sound Auto Co.—1405-7 Broadway. (National, Rambler, Commerce.) Garage.

Supplies, Automobile.

Motor Equipment Co.—901 Pike St.

SPOKANE—

Automobile Agents and Dealers.

Bartoo, Geo. E.—409 First Ave. (Monarch, Reo.)

Columbia Garage, Inc.—327 Front St. (Cadillac, Winton.)

Franklin Garage.—1024 Sprague St. (Franklin.)

Glenn, C. L. (Gale.)

Hornburg Auto Co.—214 Post St. (Dolson, Maxwell.)

Rose Automobile Co., The.—1st and Walnut Sts. (Aerocar, National, Mitchell, American, Mors.)

Stilson, Adelbert.—1018 Sprague Ave. (Peerless.)

Garages.

Northwest Motor Co.—2nd Ave.

TACOMA—

Automobile Agents and Dealers.

Acme Garage Co., Inc.—13th and Tacoma Ave., J. B. Knight, Mgr. (Cadillac, Knox, Winton.) Garage.

American Automobile Co.—S. 2nd and St. Helena Ave. Wing Bros., Mgrs. (Reo, Stoddard-Dayton.)

Auto Livery & Express Co.—S. 10th and Tacoma Ave. (Maxwell, Johnson.)

Bell, John M.—12th and Pacific Ave. (Columbia.)

Pacific Commercial Car Co., Louis Younie, Mgr.—8th and Pacific Ave., (Cartecar, Lambert.)

Rambler Auto Agency.—707 Pacific Ave. (Rambler.)

WASHINGTON (Continued)

Reliable Automobile Co.—7th and Pacific Ave., W. O. Williams, Mgr. (Baker, Buick, Oldsmobile, Pope-Hartford, Pope-Toledo, Thomas.) Garage.

Tacoma Automobile Co.—743 S. Tacoma Ave. (Franklin.)

Washington Automobile Co.—7th and Pacific Aves., W. W. Pickerell, Mgr. (Ford, Jackson, Mitchell.)

Wilburn Bros. (Holsman.)

Young, Thomas G.—707 Pacific Ave. (Rambler.)

Garages.

Acme Garage Co., Inc.—13th and Tacoma Ave., J. B. Knight, Mgr. (Cadillac, Knox, Winton.)

Harmon, S. F.

Reliable Automobile Co.—7th and Pacific Ave. (Baker, Buick, Oldsmobile, Pope-Hartford, Pope-Toledo, Thomas.)

South Tacoma Garage Co., P. Leonard, Mgr.

WAITSBURG—

Automobile Agents and Dealers.

Preston Auto Co. (Oldsmobile.)

WENATCHEE—

Garages.

Walker, Percy.

WALLA WALLA—

Automobile Agents and Dealers.

Googins, Frank & Henderson. (Archer, Ford.)

Henderson, Corkrum & Co. (Ford.)

Inland Auto Co.—Spokane and Alder Sts. (Franklin, Buick, Thomas, Oldsmobile.)

Moore Automobile Co. (Franklin.)

YAKIMA—

Automobile Agents and Dealers.

Yakima Auto Co. (Monarch.)

WEST VIRGINIA

CHARLESTOWN—

Automobile Agents and Dealers.

Triple State Electric Co.—McFarland St. (Pope-Waverley.)

Parts and Accessories Manufacturers.

Powhattan Brass & Iron Works.—Pipe, brass, fittings.

CLARKSBURG—

Automobile Agents and Dealers.

Howell, Fleming, Dr. (Waltham.)

Osburn's Sons, J. F. (Cadillac.)

ELKINS—

Automobile Agents and Dealers.

Woodford, J. M. (Waltham.)

HUNTINGTON—

Automobile Agents and Dealers.

Hanley, I. E. (Jewel.)

Wolcott, L. A. (Cadillac.)

WEST VIRGINIA (Continued)

Repairing, Automobile.

Martinsburg Automobile Repair and Storage Co.—118 S. Queen St.

MANNINGTON—

Repairing, Automobile.

Manning Forge Tool Co.

MARTINSBURG—

Clubs and Associations.

Martinsburg Automobile Club., X. Poole

Martinsburg, Sec.

MORGANTOWN—

Automobile Agents and Dealers.

Donley & Dugan. (Cadillac.)

PARKERSBURG—

Automobile Agents and Dealers.

Callanan & Hogg. (Cadillac.)

Mallory Bros & Steward. (White.)

Parkersburg, Auto Co.—607 Julian St. (Pope-Waverley.)

Woodyard, C. C. (Waltham.)

WHEELING—

Clubs and Associations.

Ohio Valley Automobile Club.

Automobile Agents and Dealers.

Mahlke Machine & Mould Works, R. H.

—15th St. (Stearns, Pope-Hartford.)

Giesey, E. M. (Jewel.)

House & Wesley.—Market and 14th Sts. (Reo, Premier.)

Sands Electric & Mfg. Co., H. S.—1143 Market St. (Rambler.)

Stamp, Jacon C.—1327 Market St. (Winton.)

Wheeling Automobile Co.—“The Auto Inn.”—16th and Goff Sts. (Winton,

Cadillac, Frayer-Miller, Reo, Rapid.)

Whittaker, H. C. (Pope-Hartford.)

WISCONSIN

ALBANY—

Automobile Agents and Dealers.

Albany Hdw. & Specialty Co. (Waltham.)

APPLETON—

Automobile Agents and Dealers.

Kruger Auto Co.—Lawrence St. (Winton, Pope-Hartford.)

Wright, Frank. (Pope-Waverley.)

Parts and Accessories Manufacturers.

Brill Engine Works. Marine motors.

Ryan & Long.—584 Oneida St. Washers.

ASHLAND—

Clubs and Associations.

Ashland Automobile Club., Maytor Hoppenyon, Sec. and Treas.

Automobile Agents and Dealers.

Hoppenyon Auto Co.—301 2nd St. E. (Ford, Reo.) Garage and repairing.

Garages.

Hoppenyon Auto Co.—301 2nd St. E. (Ford, Reo.) Repairing.

Repairing, Automobile.

Hoppenyon Auto Co.—301 2nd St. E. (Ford, Reo.) Garage.

WISCONSIN (Continued)

BARABOO—

Automobile Agents and Dealers.
Lanich, Arthur S. (Gale.)

BEAVER DAM—

Parts and Accessories Manufacturers.
Beaver Dam Malleable Iron Co. Malleable iron castings.

BELOIT—

Clubs and Associations.
Beloit Automobile Club, Harry M. Vale, Sec.

Automobile Agents and Dealers.
Vale, Harry M.—736 Broad St. (Rambler.)

Parts and Accessories Manufacturers.
Beloit Glove & Mitten Co.—217 Grand Ave. Gloves and gauntlets.

Lipman Mfg. Co.—300 Pleasant St. Speed indicators, pumps.

Warner Instrument Co.—Autometer, speed indicator.

CHILTON—

Automobile Agents and Dealers.
Thieson, Fred. (Jewel.)

EAU CLAIR—

Automobile Agents and Dealers.
Eau Clair Motor Car Co.—Chase Bldg. (Pope-Toledo, Waltham.)

Moon, C. D. (Franklin.)

Tanberg Auto Co.—River and Gibson Sts. (White, Buick, Oldsmobile, Pope-Waverley.) Garage, repairing.

Wilson, Sam J. (Jackson.)

Garages.

McCann, J. N.

Tanberg Auto Co.—River and Gibson Sts. (White, Buick, Oldsmobile, Pope-Waverley.) Repairing.

Repairing, Automobile.

Tanberg Auto Co.—River and Gibson Sts. (White, Buick, Oldsmobile, Pope-Waverley.) Garage.

FOND DU LAC—

Automobile Agents and Dealers.

Bradly Co., David. (Rambler.)

Brugger & Smith. (Waltham.)

Crescent Auto & Machine Co.—Marr and East 2nd St. (Cadillac, Buick, Pope-Hartford, White.) Garage, repairing.
Worthing Automobile Co., G. W.—31 W. 2nd St. (Pope-Waverley, Jackson.)

Garages.

Crescent Auto & Machine Co.—Marr and East 2nd St. (Cadillac, Buick, Pope-Hartford, White.) Repairing.

Motorboat Manufacturers.

Pope Boat Co., The

Parts and Accessories Manufacturers.
Duplex Coil Co. Spark coils.

Longdin-Bugger Co. Auto tops.

Repairing, Automobile.

Crescent Auto & Machine Co.—Marr and East 2nd St. (Cadillac, Buick, Pope-Hartford, White.) Garage.

WISCONSIN. (Continued)

GRAND RAPIDS—

Automobile Agents and Dealers.
Drumb, W. A. (Waltham.)

GREEN BAY—

Automobile Agents and Dealers.

Lucia Cycle Co. (Pope-Toledo, Pope-Hartford, Waltham.)

Parts and Accessories Manufacturers.
Green Bay Machine Co. Marine motors.

HARTFORD—

Automobile Manufacturers, Gasoline.
Kissel Motor Car Co.

IRONWOOD—

Automobile Agents and Dealers.
Charlonneau & Sons, E. (Rambler.)

JANESVILLE—

Clubs and Associations.

Janesville Automobile Club, Frank H. Blodgett, Sec.

Automobile Agents and Dealers.
Pierson, Roy. (Maxwell.)

Spencer & Parker—121 East Milwaukee St. (Jackson.)

KENOSHA—

Automobile Agents and Dealers.
Kent, M. H. (Waltham.)

Automobile Manufacturers, Gasoline.
Earl Motor Car Co.

Jeffrey & Co., Thos. B.

Automobile Manufacturers, Gasoline, Commercial.

Jeffrey & Co., Thos. B.

Garages.

Gardiner Garage, Arthur, The.—S. E. cor. Wisconsin and Exchange Sts.

Parts and Accessories Manufacturers.
Badger Brass Mfg. Co.—111th Ave., 36th-37th Sts. Gas and oil lamps, acetylene and electric generators.

Chicago Brass Co. Brass and copper metals, brass and copper rods, brass and copper tubing.

Windsor Spring Co., The. Seat springs.

LA CROSSE—

Automobile Agents and Dealers.

Babb, W. D.—820 Cass St. (Pope-Hartford.)

Burford, W. D.—227 Main St. (Lambert.)

Eperson, F.—114 N. 11th St. (Waverley.)

James Co., A.—1st and Kings Sts. (Winton.)

Kroner, J. C.—1433 Main St. (Maxwell.)

La Crosse Motor Car Co.—127 N. 3rd St. (Mitchell, Cadillac.)

Nutzel, Fred.—1108 S. 5th St. (Rambler.)

Tanberg Auto Co.—312 State St. (White.)

Withee, W. W. (Mitchell.)

WISCONSIN (Continued)

Garages.

Auto Rapid Transit Co.—Trane Bldg.

MADISON—

Automobile Agents and Dealers.

Hokanson Automobile Co.—Pinckney and Doty Sts. (Buick, Winton, Cadillac, Pope-Waverley.)

Madison Automobile Garage.—116 S. Pinckney St. (Ford, Reo.) Repairing, garage.

Stondall & Melaas, Messrs.—309 E. Wilson St. (Rambler.)

Garages.

Madison Automobile Garage.—116 S. Pinckney St. (Ford, Reo.) Repairing. Wisconsin Wagon Co.

Motorboat Manufacturers.

Hankscraft Co.

Parts and Accessories Manufacturers.

French Battery Co. Primary batteries. Gisholt Machine Co.—1300 Washington Ave. Turret lathes, clinching machines, boring mills, tool grinders, reamers.

Madison-Kipp Mfg. Co. Pumps.

Power Co., J. J.—653 Main St. Carbureters.

Schoelkopf Mfg. Co. Lubricators.

Repairing, Automobile.

Madison Automobile Garage.—116 S. Pinckney St. (Ford, Reo.) Garage.

MANITOWOC—

Automobile Agents and Dealers.

Reinfreid, C. J. (Cameron.)

Parts and Accessories Manufacturers.

Aluminum Foundry Co. Aluminum, brass, bronze and copper castings.

MARINETTE—

Automobile Agents and Dealers.

Mechanical Supply Co.—Mission Point Bldg. (Rambler, Maxwell, Rapid.)

Watson Bros. (Waltham.)

MENASHA—

Automobile Agents and Dealers.

Wheeler, W. L. (Buick, Winton.)

MENOMONIE—

Motorboat Manufacturers.

Globe Iron Works.

MILWAUKEE—

Clubs and Associations.

Milwaukee Automobile Club, Frank T. Drought, Sec.

Milwaukee Automobile Trade Ass'n., Alfred Reeke, Sec., care of Solliday, M. C., Co.

Wisconsin State Automobile Ass'n., care of Milwaukee Automobile Club.

Automobile Agents and Dealers.

Automobile Exchange.—501 Broadway. (Dragon, Jackson.)

Automobile Transit Co. (Gale.)

Auto Transit & Repair Co. (Jackson.)

WISCONSIN—Milwaukee (Continued)

Bailey, George.—421 Clinton St. (Lambert.)

Bates-Odenbrett Auto Co.—501 Broadway. (Buick, Winton.)

Browne-Friend Motor Co.—228 Wisconsin St. (Mitchell.)

Commercial Auto Co.—1103 Grand Ave. (Logan.)

Curtis Automobile Co., The.—Grand Ave. (Ford.)

Danielson, C. B. (Monarch.)

Electric Vehicle & Garage Co.—621 Grand Ave. (Waltham.)

Hibbard Automobile Co.—187 Wisconsin St. (Pierce Arrow, Oldsmobile, Haynes.)

Hickman, Kraemer & Croll Co., The.—508 Merrill Bldg. (Cartercar.)

Jeffrey & Co., Thos. B.—455 Broadway. (Rambler.)

Jonas Automobile Co.—726 National Ave. (Peerless, Cadillac.) Garage, repairing.

Krueger Auto Co. (Pope-Hartford.)

Leverenz, E. B.—930 3rd St. (Aerocar, Cameron.)

McDuffy Automobile Co.—228-232 Wisconsin St. (De Luxe, Stoddard-Dayton.)

Sanger, E. F. (Maxwell.)

Singer Automobile Co.—573 Farwell Ave. (Franklin, Maxwell.)

Solliday & Co.—4th and Prairie Sts. (Wayne.)

Toepfer's Sons, Frank.—413 National Ave. (Earl.)

Ure & Co., John, Jr.—172 12th St. (Marmon.)

Welch Bros. Motor Car Co.—Grand Ave. cor. 7th St. (Locomobile, Packard, Pope-Hartford, Woods.) Supplies, repairs, garage.

Automobile Manufacturers, Gasolene.

Hay-Berg Motor Car Co.—Burleigh and Well Sts.

Iverson & Co., J. C.—425 Water St.

Automobile Manufacturers, Gasolene Commercial.

Meisellbach Motor Wagon Co.

Automobile Manufacturers, Steam, Commercial.

Johnson Service Co.—149-153 Michigan St.

Garages.

Hein & Casper.—501 Broadway.

Jonas Automobile Co.—726 National Ave. (Peerless, Cadillac.) Repairing.

Welch Bros. Motor Car Co.—Grand Ave. cor. 7th St. (Locomobile, Packard, Pope-Hartford, Woods.) Repairing, supplies.

Zerbel & Mulkern.—225 Grand Ave.

WISCONSIN—Milwaukee (Continued)

Motorcycle Manufacturers.

Harley-Davidson Motor Co.—315 39th St.

Leader Automobile Co., The.—2442 Lisbon Ave.

Merkel Motor Co.

***Parts and Accessories Manufacturers.**

Abresch Co., Charles.—398 4th St. Wood and metallic bodies, automobile tops.

Automobile Novelty Co. Cylinder compression meters, gauge pressure spark plugs.

Avery Portable Lighting Co.—18-22 Martin St. Tanks, tire inflating tanks.

Badger Chemical Mfg. Co.—143 Reede St. Fire extinguishers, metal polishes, hand soaps.

Badger Motor Co. Gasolene marine motors.

Barth Mfg. Co. Jacks.

Battery Power Co.—247-253 Madison St. Storage batteries.

Beaver Mfg. Co.—Barclay and Oregon Sts. Automobile motors.

Browning Mfg. Co. Electric motors.

Christensen, N. A.—1212 Harman Bldg. Fuel and air pumps.

Clemick-Hirsch Co.—594 National Ave. Carbureters, marine motors.

Crucible Steel Castings Co. Steel castings.

Davis Mfg. Co.—935 30th St. Gasolene motors.

Dutcher Co., J. A. & P. E. Steel castings.

Electric Vehicle Supply Co.—621 Grand Ave. Storage batteries, charging apparatus.

Ellsworth & Thayer Mfg. Co. Miscellaneous wearing apparel, gloves, gauntlets.

Fast, Otto.—Greenfield and 25th Sts. Carbureters.

Garage Equipment Co. Brake locks, brakes, muffler cutout valves.

General Accumulator & Battery Co.—152 2nd St. Storage batteries.

Haase Motor Works.—1019 Lloyd St. Gasolene, marine motors.

Hansen Mfg. Co. O. C.—356 E. Water St. Wearing apparel, gloves, gauntlets.

Hoffman & Billings Mfg. Co. Pipe and brass fittings, gasolene automobile motors.

Kemp Smith Mfg. Co.—Linus St. and Woodward Ave. Milling machines, milling cutters.

Milwaukee Auto Engine Supply Co.—706-708 Winnebago St. Transmission gears, gasolene automobile motors, timers.

Milwaukee Brass Mfg. Co. Brass pipe fittings.

WISCONSIN—Milwaukee (Continued)

Milwaukee Electric Co. Electric generators, electric motors.

Milwaukee Motor Co.—615 Clyborn Ave. Transmission gears, gasolene and automobile motors, gasolene marine motors, mufflers, circulating pumps.

Milwaukee Steel Foundry Co. Steel castings.

Morawetz Co. Automobile robes, miscellaneous wearing apparel, caps, gloves.

Motor Car Power Equipment Co.—Rear 577 Grove St. Gasolene marine motors.

National Brake & Electric Co. Clutches.

National Elastic Nut Co. Lock nuts and washers.

Northwestern Storage Battery Co.—448 Milwaukee St. Storage batteries, searchlights and lamps.

Northmann-Duffke Foundry Co.—26th and Layton Aves. Gray iron castings, steel castings, brass and nickel plating, pressed steel products, stampings, tanks, storage tanks.

Peez & Hoffman.—3rd St., nr. Fowler. Wood and metallic bodies.

Phenix Mfg. Co. Portable houses.

Rundle-Spencer Mfg. Co. Pipe, brass fittings.

Sherman-Lemke Coil & Supply Co.—106 Wisconsin St. Spark coils, spark plugs.

Smith, A. O.—Park and Clinton Sts. Pressed steel frames, steering columns, steering wheels, transmissions, axles, wheels, control levers, dashes, pressed steel.

Smith Steel Castings Co., Geo. H.—500 Clinton St. Steel castings.

South Side Steel & Malleable Casting Co. Malleable iron castings.

Stowell Mfg. & Foundry Co. Gray iron castings, malleable iron castings.

Spence Mfg. Co.—279 Park St. Oil cups, grease cups, brass castings.

Verstraete Mfg. Co., Ed.—421 Clinton St. Circulating pumps, clutches.

Wadhams Oil Co. Oils.

Western Auto-Supply Co.—285 Virginia St. Marine Motors.

Repairing, Automobile.

Jonas Automobile Co.—726 National Ave. (Peerless, Cadillac.) Garage.

Welch Bros. Motor Car Co.—Grand Ave. cor. 7th St. (Locomobile, Packard, Pope-Hartford, Woods.) Garage, supplies.

Supplies, Automobile.

Welch Bros. Motor Car Co.—Grand Ave. cor. 7th St. (Locomobile, Packard, Pope-Hartford, Woods.) Repairs, garage.

WISCONSIN (Continued)

MONROE—

Automobile Agents and Dealers.

Manning, E. J. (Holsman.)

Williams, J. H. (Jewel.)

Motorcycle Agents and Dealers.

Wisconsin Motorcycle Co. (Indian.)

MONTFORD—

Automobile Agents and Dealers.

Goold & Johnson. (Cadillac.)

NEENAH—

Automobile Agents and Dealers.

Bergstrom, C. H. (Rambler, Ford.)

OCONOMOWOC—

Garages.

Eastman, A. A.—116 Milwaukee St.

OCONTO—

Automobile Agents and Dealers.

Lucia Cycle Co.—113 Main St. (Pope-

Hartford, Pope-Toledo, Waltham.)

OSHKOSH—

Clubs and Associations.

Oshkosh Automobile Club, F. E. Waite, Sec.

Automobile Agents and Dealers.

Chase, L. O.—193 Main St. (Thomas.)
Repairing.

Faber & Co., Wm. (Cartercar.)

Gates, L. Frank. (Premier.)

Hinman, J.—326 Main St. (Haynes.)

Krueger Automobile Co.—233 Main St.
(Eclipse, Premier.)

Neville & Co. (Pope-Toledo.)

Waite, F. E. (Mitchell.)

Garages.

Auto Inn.—226 Main St.

Motorboat Manufacturers.

Doman Co., H. C.

Jones & Laborde.

Oshkosh Boat Works.

Parts and Accessories Manufacturers.

Doman Co., H. C. Gasolene marine
motors.

Kaufman, Chas.—45 S. Main St. Car-
bureters, gasolene strainers.

Oshkosh Malleable Iron Co. Malleable
iron castings, spark coils.

Termaat & Monahan Co. Marine mo-
tors.

Repairing, Automobile.

Chase, L. O.—193 Main St. (Thomas.)

PORTAGE—

Motorboat Manufacturers.

Portage Boat & Engine Co.

RACINE—

Automobile Agents and Dealers.

Electrical Construction Co. (Mitchell.)

Hall, S. (Holsman.)

Miller, F. J.—Lake Ave. and 3rd St.
(Winton, Cadillac.)

Pierce Engine Co.—2200 Clark St.
(Pierce-Racine.)

Automobile Manufacturers, Gasolene.

Mitchell Motor Car Co.

WISCONSIN (Continued)

**Automobile Manufacturers, Gasolene
Commercial.**

Mitchell Motor Car Co.

Garages.

Miller, William H.—Cor. 7th and Wis-
consin Sts.

Motorboat Manufacturers.

Racine Boat Co.

Motorcycle Manufacturers.

Mitchell Motor Car Co.

Parts and Accessories Manufacturers.

Harvey Spring Co. Body springs.

Holbrook-Armstrong Iron Co. Gray
iron castings.

Piggins Bros. Marine motors.

Racine Brass & Iron Co. Brass, bronze,
aluminum and copper castings, gray
iron castings.

Racine Engine & Machinery Co. Steam
engines.

Racine Novelty Mfg. Co.—600 6th St.
Storm aprons and curtains, wood and
metallic bodies, battery boxes, spark
coil boxes, tool boxes, dashes and fen-
ders, automobile tops.

RACINE JUNCTION—

Automobile Manufacturers, Gasolene.

Pierce Engine Co.

Motorboat Manufacturers.

Pierce Engine Co.

Parts and Accessories Manufacturers.

Belle City Mfg. Co. Gray iron castings.

RIPON—

Parts and Accessories Manufacturers.

Ripon Knitting Works. Gloves.

SHEBOYGAN—

Clubs and Associations.

Automobile Clubs of Sheboygan.

Automobile Agents and Dealers.

Braasct, Wm. (Waltham.)

Runmele, E. H.—807 N. 8th St. (Win-
ton.)

STEVENS POINT—

Automobile Agents and Dealers.

Anders & Van Hecke. (Rambler.)

STURGEON BAY—

Motorboat Manufacturers.

Sturgeon Bay Boat Mfg. Co.

SUN PRAIRIE—

Garages.

Peshak & Co., E. H.

TARKIO—

Automobile Agents and Dealers.

Tarkio Electric & Water Co. (Pope-
Waverley, Waltham.) Repairing.

Repairing, Automobile.

Tarkio Electric & Water Co. (Pope-
Waverley, Waltham.)

TWO RIVERS—

Parts and Accessories Manufacturers.

Aluminum Mfg. Co. License numbers,
name plates, oil cans.

Kahlenberg Bros. Gasolene, automo-
bile motors and marine motors.

WISCONSIN (Continued)

WARSAW—

Automobile Agents and Dealers.

Levenhager Auto & Garage Co. (Rambler.)

WAUKESHA—

Automobile Manufacturers, Gasolene.
Waukesha Motor Co.

Garages.

Ladewig & Stock Co.—277 Madison St.
Repairing.

Parts and Accessories Manufacturers.

Waukesha Motor Co.—110 North St.
Motors, timers, transmissions, clutches,
garage connections.

Waukesha Sheet Steel Co. Iron and
steel sheet.

Repairing, Automobile.

Ladewig & Stock Co.—277 Madison St.
Garage.

WAUPUN—

Automobile Agents and Dealers.

Shaler Co., C. A., The. (Elmore.)

Parts and Accessories Manufacturers.

Shaler Co., C. A., The. Vulcanizers,
vulcanizing materials.

WAUWATOSA—

Automobile Agents and Dealers.

Smith, A. I.—213-219 Wisconsin St.
(Cameron.)

WEST ALLIS—

Parts and Accessories Manufacturers.

Tobin-Gerlinger Steel Castings Co.
Steel castings.

WEST DE PERE—

Motorboat Manufacturers.

Kidney & Son., Dan.

WHITEWATER—

Clubs and Associations.

Whitewater Automobile Club, T. N.
Blackman, Sec.

Automobile Agents and Dealers.

Halverson, H. (Cadillac.)

WYOMING

CHEYENNE—

Automobile Agents and Dealers.

Capital Garage.—17-19 Capital St. (Reo,
Premier, Gale, Franklin, Buick, Mora,
American.)

LARAMIE—

Automobile Agents and Dealers.

Greenwood, E. E.—2nd St. (Mitchell,
Rambler.)

Laramie Cycle & Garage Co.—314 2nd
St. (Maxwell.) Repairing, garage.

Lockwood, E.—104 2nd St. (Mora, Car-
tercar, Smith.)

McCollum, H. E., Dr.—2nd St. (Lam-
bert.)

Garages.

Laramie Cycle & Garage Co.—314 2nd
St. (Maxwell.) Repairing.

WYOMING (Continued)

Lohlein, Jos.

Lovejoy Novelty Works, The.—2nd St.
Repairing.

Repairing, Automobile.

Laramie Cycle & Garage Co.—314 2nd
St. (Maxwell.) Garage.

Lovejoy Novelty Works, The.—2nd St.
Garage.

SHERIDAN—

Automobile Agents and Dealers.

Heald, J. Franklin. (Jewel.)

ALGERIA

ALGIERS—

Clubs and Associations.

Automobile Club of Algeria.—23 Boule-
vard Carnot. Correspondents of the
A. C. F.

Publications.

Intermédiaire Automobile, L'.—39 rue
d'Isly.

ARGENTINE REPUBLIC

BUENOS AYRES—

Automobile Agents and Dealers.

Lomer, Louis L.—care of U. S. Lega-
tion. (Columbia.)

Molinero, M. & J. (Holsman.)

AUSTRIA

AUSSIG-SUR-ELBE—

Motorcycle Manufacturers.

Roessler und Jauernig.

BREGENZ—

Automobile Manufacturers, Gasolene.

Bilgeri-Wurzer und Co. (Helios cars.)

Motorcycle Manufacturers.

Bilgeri-Wurzer und Co. (Helios mo-
torcycles.)

BRUNN (MORAVIA)—

Motorcycle Manufacturers.

Kohout und Co.—40 Warwastrasse.

BUDAPEST (HUNGARY)—

Clubs and Associations.

Automobile Club Hongrois.—Palais Tor-
ley, 16 Sandorfehrz-Utca.

GRAZ (STYRIA)—

Motorcycle Manufacturers.

Cless und Plessing.—36 Grazergasse.

Styria Farradwerke, Jos. Buch und Co.

JUNGBUNZLAU (BOHEMIA)—

Automobile Manufacturers, Gasolene.

Laurin et Klement, Slavia Fahrradwerke.
(Laurin-Klement cars.)

Motorcycle Manufacturers.

Laurin et Klement, Slavia Fahrradwerke.
(Laurin-Klement motorcycle.)

Tricar Manufacturers.

Laurin et Klement, Slavia Fahrradwerke.
(Laurin-Klement tricars.)

AUSTRIA (Continued)

NESELDORF (MORAVIA)—

Automobile Manufacturers, Gasolene.
Nesseldorfer Wagenbaufabriks. Gesellschaft.

SEMMERING-STYRIA—

Automobile Manufacturers, Gasolene.
Maschinen und Wagenbaufabriks, Actien
Gesellschaft. (M. W. F. cars.)

WIENER-NEUSTADT—

Automobile Manufacturers, Gasolene.
Oesterreicher Daimler Motoren, Gesellschaft. (Daimler cars.)

VIENNA—

Clubs and Associations.

Automobile Club of Austria (Oesterreicher Automobile Club).—10 Kaerntnerring.

Wiener Aero Klub (Vienna Aero Club).

Automobile Agents and Dealers.

Tippel, Alfred Joseph.—XIII Linzerstrasse. (Lambert.)

Automobile Manufacturers, Gasolene.
Bock und Hollender.—72 Hauptstrasse.
Graef und Stift.—70 Weinberggasse. (Gräf-Stift cars.)

Automobile Manufacturers, Gasolene Commercial.

Nesseldorfer Wagenbau Fabriks. Gesellschaft-Semmering. (Omnibus.)

Automobile Manufacturers, Steam Commercial.

Komarek.—55 Quellengasse. (Trucks.)

Motorcycle Manufacturers.

Austria Motorenwerke, Ignaz & Josef Mezera.

Riesner, Josef.—6 Schmalzhofg.

Parts and Accessories Manufacturers.

Armbruster, S.—4 Porzellengasse. Automobile bodies.

Bittner & Co., M.—Taborstrasse 108. Acetylene lamps.

Dénes, Friedmann und Co.—14 Stubenring. Ball bearings.

Fleischmann, M.—Titaniawerke. Primary batteries.

Lohner und Co., Jacob.—2 Porzellangasse. Bodies.

Oesterreichisch-Amerikanische Gummifabrik-Breitensee, Hütteldorferstrasse 74. Pneumatic tires. (Continental, Austro-American tires.)

Oesterreichisch Maschinen Actiengesellschaft. Automobile motors. (Norton motors.)

Vereingte Gummiwarenfabriken Harburg-Wien.—Pneumatic tires. (Harburg-Wien tires.)

Weichman, Veuve Franz.—Dresdenerstrasse 116. Acetylene lamps.

Publications.

Allgemeine Automobil-Zeitung.—5 Fleischmarkt. Pub. Weekly.

Allgemeine Sport Zeitung.—1 Annahof.

AUSTRALIA

PERTH—

Automobile Agents and Dealers.
Splatt Wall & Co. (Monarch.)

SYDNEY—

Automobile Agents and Dealers.
Bennett & Wood. (Monarch.)

BELGIUM

BERCHEM-ANVERS—

Automobile Manufacturers, Gasolene.
Compagnie de Constructions Mécaniques, Société Anonyme.—80 rue Jan-Breydel. (Royal Star cars.)
Minerva Motors, Ltd. (Minerva cars.)

Motorcycle Manufacturers.

Compagnie de Constructions Mécaniques.—80 rue Jan-Breydel. (Royal Star motorcycles.)

Minerva Motors, Ltd. (Minerva motorcycles.)

Van Nieuwenhoven und de Clerq.—376 rue Longue-d'Argile.

Parts and Accessories Manufacturers.

Compagnie de Constructions Mécaniques.—80 rue Jan-Breydel. Mfrs. motors, motorcycle, differential and transmission gears.

BRUSSELS—

Clubs and Associations.

Aero Club de Belgique. (Belgian Aero Club.) Member F. A. I.

Automobile Club of Belgium.—5 Place Royale.

Automobile Manufacturers, Gasolene.

Belgica.—rue Vander Straeten. (Belgica cars.)

Compagnie Belge de Constructions Automobiles, Société Anonyme.—10 rue Ruysdael. (Pipe cars.)

Metallurgique, Société Anonyme La.—1 place de Louvain. (Metallurgique cars.)

Vivinus, Société Anonyme des Ateliers.—54 rue Destonvelles. (Vivinus cars.)

Automobile Manufacturers, Gasolene Commercial.

Compagnie Belge de Construction d'Automobiles.—10 rue Ruysdael. (Trucks.)

Germain, Société Anonyme Ateliers. (Germain omnibus.)

Motorcycle Manufacturers.

Bercley Cycle & Motor Works.—171 ave. de la Reine. (Bercley motorcycles.)

Pottelet et Preudhomme.—33 rue Jules-Van-Praet.

Parts and Accessories Manufacturers.

Billy, C.—1 rue Jean Stas. Oil and acetylene lamps.

Bondin et Cie.—23 place du Chatelain. Acetylene lamps.

BELGIUM (Continued)

Briquet et de Raet.—13 rue de Manchester. Radiators.
 Ceulemans, J.—8 rue d'Espagne.—St. Gilles. Wood wheels.
 Compagnie Belge de Construction d'Automobiles, Société Anonyme.—10 rue Ruysdael. Automobile and motorcycle motors.
 De Ruyter de Messine.—125 bvd. de la Senne. Bodies.
 Desclée et Cie., G.—171 ave. de la Reine. Non-skids, leather tires.
 Dieteren frères.—54 chaussée de Charleroi. Bodies.
 Dratz.—21 rue de l'Hopital. Goggles.
 Franeau, Société Anonyme des Etablissements.—15 rue Veyt. Bodies.
 Franskin, Felix.—35 rue Memling, Cureghem. Tire pumps.
 Fremy, E.—57 bvd. du Hainaut. Spark plugs.
 Gabillon, Jules-Ernst.—218 Chaussée de Mons. Radiators.
 Gauthier et Trentelivres.—30 rue de Malines. Chains, coils, acetylene lamps, oil lamps, lubricators.
 George, Albert.—67 rue du Téléphone. Speed indicators.
 Jenatzy-Leleux, Manufacture Générale de Caoutchouc.—10 rue Stephenson Solid and pneumatic tires, non-skids, Jenatzy tires.
 Kley, Edouard.—18 rue Defacqz. Pneumatic tires (Excelsior tires).
 Lemoine, J.—39 bvd. Baudoin. Oil and acetylene lamps.
 Maison des Sports.—46 rue du Midi. Wearing apparel, fur coats, hats and caps.
 Marousse, J. B.—30 rue du Moulin. Bodies.
 Mettwie-Debrie, J.—13 rue de France. Bodies.
 Nichel et fils.—25 rue de France. Bodies.
 Neelemans, A. et Tardieu.—25 rue d'Edinbourg. Elastic wheels.
 Pittevil, A.—rue de la Chancellerie. Acetylene lamps.
 Poisat et Cie.—6 rue de la Linière. Non-skids.
 Pelgrims, Forges et Ateliers de Construction R.—145 rue Neuve. Wood wheels, springs.
 Pneumatiques Hutchison.—1 place Louise. Pneumatic tires. (Hutchison tires.)
 Roose, J.—46 rue de Bavière. Acetylene lamps.
 Siersaek, G.—95 bvd. du Hainaut. Coils.
 Snutzel frères.—9 rue de l'Activité. Bodies.
 Société Anonyme L'Acétylithe.—61 bvd. du Hainaut. Acetylene lamps.

BELGIUM (Continued)

Thomas et Cie., Auguste.—58 quai des Charbonnages. Springs.
 Van den Plas.—6 rue des Drapiers. Bodies.
 Willocq-Bottin.—33 Square Gutenberg. Acetylene lamps, oil lamps.
Publications.
 Automobile Belge, L'.—Pub. at 50 rue Grétry.
 Sport, Le.—22 rue de la Braie.
 Sportsman, Le.—14 rue d'Or.
CHARLEROI—
Parts and Accessories Manufacturers.
 Germain, Ateliers.—Monceau-sur-Sambre. Automobile and marine motors.
 Société Anonyme La Mecanique de Precision. High tension magnetos.
COUILLET—
Automobile Manufacturers, Gasolene Commercial.
 Société Anonyme de Marcinelle et Couillet. (Trucks.)
GAND—
Motorcycle Manufacturers.
 Vandervelde.—36 rue des Foulous.
Parts and Accessories Manufacturers.
 Eggermont, M. E.—9 rue du Petit-Dock. Marine motors.
 Société Anonyme l'Auto-Carrosserie.—rue de Sans-Nom. Bodies.
HAINÉ-SAINT-PIERRE—
Automobile Manufacturers, Gasolene.
 Usines et Fonderies de Baume et Marpent.
HERSTAL—
Automobile Manufacturers, Gasolene.
 Armes de Guerre, Fabrique Nationale d'.
Automobile Manufacturers, Gasolene Electric.
 Auto-Mixte (Société l'.)—93 rue Hayeneux. (Auto-Mixte cars.)
Motorcycle Manufacturers.
 Armes de Guerre, Fabrique Nationale d'. (F. N. motorcycles.)
 Bayard, Ch.—80 rue Voie-de-Liège. (Bayard motorcycles.)
 Gerkinet, Josef.—rue Hayeneux.
 Sarolea, Maison.—269 rue St. Lambert. (Sarolea motorcycles.)
 Simonon, Fonderies et Ateliers.
Parts and Accessories Manufacturers.
 Hamoir, Duchesne et Cie. Pressed steel frames.
 Marck frères.—rue-Hoyoux. Motorcycle motors.
 Sarolea, Maison.—269 rue St. Lambert. Motorcycle motors.
Tricar Manufacturers.
 Sarolea, Maison.—269 rue St. Lambert. (Sarolea tricans.)
LIEGE—
Automobile Manufacturers, Gasolene.
 La Locomotrice, Société Anonyme. (La Locomotrice cars.)

BELGIUM (Continued)

Nagant frères.—44 quai de Coronmeuse. (Nagant cars.)

Piedboeuf, Ateliers, A. G.—63 rue de Fragnér. (Piedboeuf Imperial cars.)

Automobile Manufacturers, Gasolene Commercial.

La Locomotrice, Société Anonyme.—35 rue de Vennes.

Nagant frères.—44 quai de Coronmeuse. (Nagant trucks.)

Motorcycle Manufacturers.

Antoine fils et Cie., V.—41 quai St. Leonard. (Antoine motorcycles.)

Wafflard, A.—19 rue Bois-Gotha. (Eole motorcycles.)

Parts and Accessories Manufacturers.

Antoine fils et Cie.—41 quai St. Leonard. Automobile and motorcycle motors (Antoine).

Ateliers, F. R. M.—Sclessin. Differential gears.

Ateliers, H. Leclerc, Société Anonyme. 33 quai St. Leonard. Electric, oil and acetylene lamps, high and low tensioned magnetos, spark coils, plugs.

Cailleau et Cie.—20 rue des Walloons. Lubricators.

Closset, Ch.—rue St-Marie. Bodies.

Englebert, fils et Cie., O.—29 rue des Vennes. Pneumatic and solid tires (Englebert tires), non-skids.

Gausset, Fernand.—5 rue du-Jardin-Botanique. Wearing apparel, fur hats, caps and coats.

Nagant frères.—44 quai Coronmeuse. Automobile and marine motors (Nagant motors), transmission and differential gears.

Marcellis et Fils.—10 rue de Moresnel. Tire pumps.

Piedboeuf, Ateliers.—63 rue de Fragnée. Automobile motors.

Robert, M.—15 rue de Sclessin. Wood wheels.

Vogt.—30 rue du Vieux-Mayeur. Bodies.

MALINES—

Parts and Accessories Manufacturers.
Bols, Petrus.—rue Haute. Wood wheels.

MARCHIENNES-AU-PONT—

Parts and Accessories Manufacturers.
Paulus et fils, J. Bodies.

MOLENBEEK-BRUSSELS—

Parts and Accessories Manufacturers.
Peeters, C. L.—85 rue Heyvaert. Lubricators.

OSTEND—

Parts and Accessories Manufacturers.
Ateliers et Chantiers Cosmos. Marine motors.

SAVENTHEM-LEZ-BRUXELLES—

Parts and Accessories Manufacturers.
Usines de Saventhem. Marine motors.
Usine Fulminator. Coils.

BELGIUM (Continued)

ST. NICHOLAS—

Parts and Accessories Manufacturers.
Janssens, Ateliers A.—rue du Gazometre. Steering gears.

SERAING—

Automobile Manufacturers, Gasolene Commercial.

Cockerill, Société Anonyme John. (Nordenfelt trucks.)

TAMISE—

Parts and Accessories Manufacturers.
Wilford et fils. Marine motors.

VERVIERS—

Automobile Manufacturers, Gasolene.
Dasse, Gérard.

Société Anonyme des Automobile Ruhl. (Ruhl cars.)

Motorcycle Manufacturers.

Huneurbein frères.—102 rue d'Ensival. Linon, L.

Parts and Accessories Manufacturers.
Dasse, Gérard.—Automobile motors.

Houben, Théodore. Perfecta non-skids, solid and leather tires (Houben tires).

Linon, L.—Ensival. Automobile motors.

BOLIVIA

LA PAZ—

Automobile Agents and Dealers.
Lanza Donato, & L. (Wayne.)

COCHABAMBA—

Automobile Agents and Dealers.
Aguayo, J. (Knox.)

CANADA

CALGARY (ALBERTA)—

Automobile Agents and Dealers.

Calgary Garage Co.—709 Centre St. (Rapid, Reo, Oldsmobile, Aerocar, Pope-Waverley.)

Downey, H. L. (Maxwell.)

Urquhart, A. S. (Matheson, North-ern.)

Western Automobile Co. (Elmore, Logan.)

Stringer, Bert. A. (Wayne.)

White & Grasswick. (Marmon, Russell, Rambler.)

CHATHAM—

Automobile Manufacturers, Gasolene.
Chatham Motor Car Co.

EDMONTON—

Automobile Agents and Dealers.
Manuel, G. M. (Buick.)

HAMILTON (ONTARIO)—

Clubs and Associations.

Hamilton Automobile Club.

Automobile Agents and Dealers.

Automobile Co. of Hamilton, Ltd.—York and Queen Sts. (Russell, Ford.)

Butler Auto Co. (Pope-Toledo.)

CANADA (Continued)

Hamilton Garage Co.—133-135 King St., W. (Oldsmobile, Franklin, Maxwell.) Garage, repairing.
Spurling, H. G. W. (Rapid.)
Garages.

Hamilton Garage Co.—133-135 King St., W. (Oldsmobile, Franklin, Maxwell.) Repairing.

Repairing, Automobile.

Hamilton Garage Co.—133-135 King St., W. (Oldsmobile, Franklin, Maxwell.) Garage.

INDIAN HEAD (SASKATCHEWAN)

Automobile Agents and Dealers.

Sharp, W. H. B. (Holsman.)

KINGSTON (ONTARIO)—

Automobile Agents and Dealers.

Angrove Bros.—88-90 Princess St. (Russell, Oldsmobile.)

LEPHBRIDGE (ALBERTA)—

Automobile Manufacturers, Gasolene.

Lephbridge Motor Car Co.

Garages.

Howard, Case & Co.

LONDON (ONTARIO)—

Automobile Agents and Dealers.

Horton, W. F.—491 Richmond Ave. (Oldsmobile.)

Garages.

Dominion Automobile Co.

MEDICINE HAT (ALBERTA)—

Automobile Agents and Dealers.

Alberta Motor Co. (Maxwell.)

MERRITON—

Automobile Agents and Dealers.

Hara, J. S. (Waltham.)

MONTREAL—

Automobile Agents and Dealers.

Automobile Import Co.—90 Stanley St. (Humber.)

Canadian Automobile Co.—342 Craig St. (Oldsmobile, Cadillac.)

International Automobile Co.—101 Burnside Place. (Dragon, Gale, Wayne.)

Morgan & Co., Henry. (Maxwell, Daimler.)

Stanley, C. F. (Stanley.)

Wilson Automobile Co.—117 Craig St. (Buick, Pierce Arrow, Rapid, Franklin, Knox.)

Garages.

Dominion Motor Car Co., Ltd.—11 Beaver Hall Hill. Repairs, supplies.
Franco-American Automobile Co.—417 Guy St.

Repairing, Automobile.

Dominion Motor Car Co., Ltd.—11 Beaver Hall Hill. Supplies, garage.
Supplies, Automobile.

Dominion Motor Car Co., Ltd.—11 Beaver Hall Hill. Garage, repairing.

MOOSE JAW—

Automobile Agents and Dealers.

Cochrane, J. J. (Waltham.)

CANADA (Continued)

NIAGARA FALLS (ONTARIO)—

Garages.

Clifton Hotel Garage.

Insurance, Automobile.

Warner Co., C. S., The. Custom House brokers, insurance brokers and attorneys.

OTTAWA—

Automobile Agents and Dealers.

Canadian Cycle & Motor Co., Ltd. (Russell.)

Ketchum & Co.—Bank and Sparks Sts. (Oldsmobile, Ford, Rolls-Royce.) Garage, repairing.

Wilson & Co.—142 Bank St. (Franklin, Pierce Arrow, Stoddard-Dayton.)

Garages.

Ketchum & Co.—Bank and Sparks Sts. (Oldsmobile, Ford, Rolls-Royce.) Repairing.

Repairing, Automobile.

Ketchum & Co.—Bank and Sparks Sts. (Oldsmobile, Ford, Rolls-Royce.) Garage.

QUEBEC—

Automobile Agents and Dealers.

McCurdy, Dr. (Maxwell.)

Quebec Auto & Launch Co.—Cor. St. Augustin and St. Patrick Sts. (Russell, Ford, Reo, Pope.)

Garages.

Campbell Garage, The.—47 St. Louis St. Supplies.

Supplies, Automobile.

Campbell Garage, The.—47 St. Louis St. Garage.

SARNIA—

Repairing, Automobile.

McCloskey, J. S.—Christina St.

SMITH'S FALLS (ONTARIO)—

Automobile Agents and Dealers.

McKinzie, A. (Maxwell.)

TORONTO—

Clubs and Associations.

Toronto Automobile Club.

Automobile Agents and Dealers.

Automobile & Supply Co.—24 Temperance St. (Stoddard-Dayton, Pierce Arrow, Franklin, Royal, Pope-Hartford, Reo.)

British & French Motor Car Co.—Mutual St. (Daimler, Panhard, Argyll, DeDion, Minerva, Swift.)

Canada Cycle & Motor Co.—105 Bay St. (Russell.)

Canada Standard Automobiles, Ltd.—124 Bay St. (Peerless.)

Dominion Automobile Co.—Bay and Temperance St. (Packard, Thomas Flyer, Stevens-Duryea, Winton, Ford, Russell.)

Hyslop Bros.—209 Yonge St. (Cadillac, Humber, Bieston.)

CANADA (Continued)

International Automobile Company
(Wayne.)

Phillips & Wrinch, Ltd.—6 Adelaide
Est. (Mitchell.)

Smith, W. S. (Buick.)

Toronto Automobile Co.—6 Adelaide
Est. (Pope.)

Garages.

Bowser & Co., S. F.—540 Front St.

Brown's Garage.—60 St. George St.

Croftan Storage Battery Co., The.—
423-425 W. Queen St.

Kay Alexander Cycle Co., The.—320
Queen St.

Tucker, W. M.—399 Spadena Ave.

Parts and Accessories Manufacturers.

Canadian General Electric Co., Ltd.—
Sales office, Electric Storage Battery
Co.

Canadian Continental Caoutchouc Co.
—145 Bay St. (Branch.) Tires.

Croftan Storage Battery Co., The.—
423-425 W. Queen St. Sparking
batteries, storage batteries, sparking
and lighting systems.

Diamond Rubber Co.—73 Adelaide St.
W. (Branch.) Tires.

Prest-O-Lite Co.—6 King St., W.
(Branch.) Acetylene tanks.

Rubber Tire Wheel Co.—Agt. Fisk
Rubber Co.

Publications.

**Canadian Electrical News and Engin-
eering Journal.**—Confederation Life
Bldg.

Canadian Motor, The.—1 Wellington
St., W.

Motoring.—Stair Bldg.

Repairing, Automobile.

College St. Garage.—College St.

VANCOUVER (BRIT. COLUMBIA)—

Automobile Agents and Dealers.

Baxter, T. S.—317 Hastings St., W.
(Haynes.)

British Columbia Auto Co.—924 Gran-
ville St. (Buick, Pierce Racine, Ford,
Jewel, Russell, Humber, Rover.)
Garage, repairing.

Gugin, Robt.—550 Seymour St.
(Franklin.)

Massey, W. J. (Rapid, Rambler.)

Vancouver Auto & Bicycle Co. (Olds-
mobile.)

Garages.

British Columbia Auto Co.—924 Gran-
ville St. (Buick, Pierce Racine, Ford,
Jewel, Russell, Humber, Rover.)
Repairing.

Repairing, Automobile.

British Columbia Auto Co.—924 Gran-
ville St. (Buick, Pierce Racine, Ford,
Jewel, Russell, Humber, Rover.)
Garage.

CANADA (Continued)

VICTORIA (BRIT. COLUMBIA)—

Automobile Agents and Dealers.

Hutchinson Bros.—Broughton St.
(Oldsmobile, Swift.) Repairing.

Plimley Automobile Co. (Humber,
Rover, Russell, Clement Tolbot.)
Garage, repairing.

Garages.

Plimley Automobile Co. (Humber,
Rover, Russell, Clement Tolbot.)
Repairing.

Repairing, Automobile.

Hutchinson Bros.—Broughton St.
(Oldsmobile, Swift.)

Plimley Automobile Co. (Humber,
Rover, Russell, Clement Tolbot.)
Garage.

WALKERVILLE (ONTARIO)—

Garages.

Ford Motor Co. of Canada, Ltd.

WEST TORONTO—

Parts and Accessories Manufacturers.

Stewart Mfg. Co. of Canada, D. M.—
151 King St. Gas lamps, burners.

WINNIPEG—

Automobile Agents and Dealers.

Brown's Automobile Co.—177-179 Prin-
cess St. (Rambler, Northern.)

Dominion Automobile Co.—310 Don-
ald St. (Winton, Russell, Ford.)

Haug Bros. & Nelleremoe Co., Ltd.—
Henry Ave. and Fountain St.
(Glide.)

Maw & Co., Jos.—Market Square.
(Rapid, Franklin, Oldsmobile, Reo.)

McCulloch & Boswell.—Ellice Ave.
and Hargrave St. (Buick, Cadillac,
Royal.)

Northern Automobile Co. (Northern.)

Repairing, Automobile.

**Consolidated Bicycle & Motor Co.,
Ltd.**—185 Notre Dame Court, 224
Logan Ave. and 849 Main St.

CUBA

HAVANA—

Automobile Agents and Dealers.

Duenas, Jose M. (Winton.)

Gutches & Smith. (Knox.)

Lopez, German. (Locomobile.)

Stowers, J. L. (Waltham.)

Velo, Angel. (Queen.)

Garages.

Harris Bros. Co.—O'Reilly 104.

Havana Garage Co.—Zulueta 28.

DENMARK

COPENHAGEN—

Clubs and Associations.

Automobile Club of Denmark.—8 Os-
tersgade.

DENMARK (Continued)

Automobile Agents and Dealers.
Fich, H. Chr. (Wayne.)
Gottschalk, C. F. (Monarch.)
Automobile Manufacturers, Gasolene Commercial.
Christiansen & Co., H. C.—63 St. Kongensgade.
Motorcycle Manufacturers.
Christiansen & Co., H. C.—63 St. Kongensgade.
Frederiksen, Herman-Carl.—39 Roskildevej.
Humber and Co. (Humber motorcycles.)
Parts and Accessories Manufacturers.
Früs, Jul.—6 Osterfarimagsgade. Tire pumps.
Hellesens Enke & V. Ludwigsen.—17 Blaagaardsgade. Primary batteries.
Silverberg, F.—Primary batteries. (Dania batteries.)

ODENSE—

Motorcycle Manufacturers.
Knudsen, Carl-Frederik-Albert.—Kongensgade.

ENGLAND

ASHTED (SURREY)—

Parts and Accessories Manufacturers.
Peto & Radford, Ltd. Spark plugs, coils, electric lamps.

BECCLLES (SUFFOLK)—

Automobile Manufacturers, Gasolene.
Anglian Motor Co. (Anglian cars.)
Parts and Accessories Manufacturers.
Anglian Motor Co., Ltd. Differential gears.
Tricar Manufacturers.
Anglian Motor Co., Ltd. (Anglian tricars and quads.)

BEESTON (NOTTINGHAM)—

Automobile Manufacturers, Gasolene.
Humber, Ltd. (Humber cars.)
Motorcycle Manufacturers.
Humber, Ltd. (Humber motorcycles.)
Tricar Manufacturers.
Humber, Ltd. (Humber tricars.)

BIGGLESWADE—

Parts and Accessories Manufacturers.
Maythorn & Son. Bodies.

BIRMINGHAM—

Automobile Manufacturers, Gasolene.
Alldays & Onions, Ltd.—Fallows Road. (Alldays cars.)
Austin Motor Co., Ltd.—Northfield. (Austin cars.)
Calthorpe Motor Co., Ltd.—81 John Bright St. (Calthorpe cars.)
Wolseley Tool & Motorcar Co.—Alderley Park. (Wolseley cars, Siddeley cars.)
Motorcycle Manufacturers.
Ariel Works.—Bournebrook. (Ariel motorcycles.)

ENGLAND (Continued)

Lloyd Motor & Engineering Co.—132 Monument Road. (L. M. C. motorcycles.)
Norton Mfg. Co.—Deritend Bridge, Floodgate St. (Norton motorcycles.)
Wall, A. W., Ltd. (Roc motorcycles.)
Parts and Accessories Manufacturers.
Adie & Nephew, Ltd.—156 Warstone Lane. Tire pumps.
Appelby, Jos., Ltd. Chains.
Aston Motor Accessories Co. Circulating pumps.
Benton & Stone.—Bracebridge St. Jacks, tire pumps, spark plugs.
Birmingham Small Arms & Metal Co. Chains, metallic wheels.
Brampton Bros, Ltd.—Oliver St. Chester St. Chains.
Brooks & Co., J. B., Ltd.—Great Charles St. Non-skids, bands.
Brown & Barlow, 16 Leveday St. Carbureters.
Dunlop Rubber Co., Ltd.—Manor Mills. Detachable rims.
Dunlop Tyre Co., Ltd.—Aston, Pneumatic tires.
Electric Ignition Co.—Sparkbrook. Spark plugs, coils and batteries (E. I. C. coils and storage batteries.)
Empire Mfg. Co.—Helena St. Jacks, chains.
James, J. T.—Loveday St. Metallic rims.
Jointless Rim Co., Ltd.—Long Acre. Metallic rims.
Lawley, Thos.—60 Kenyon St. Chains.
Lombard Tube Co. Metallic rims.
Lucas, Jos., Ltd.—Great King St. Horns, sirens, acetylene and oil lamps, jacks, tire pumps.
Middlemore & Lamplugh, Ltd.—Holloway Head. Non-skids. (Pegasus bands.)
Midland Rubber Co., Ltd.—Ryland St. Pneumatic tires.
Morgan Chain & Pedal Co., Ltd.—Floodgate St. Chains.
Oldfield, J. and R.—Warwick St. Electric lamps.
Richards & Co., Jos.—Spring Hill. Springs.
Roberts Non-Skid Motor Tyre Co.—Gripwell Works, St. Mary's Row. Leather tires, gauges, non-skid bands.
Ryley, J. A.—23½ Martineau St. Spark plugs.
Shaw Motor Tyre Tread Co.—135 Steelhouse Lane. Non-skid bands.
Statter & Co.—Newhall St. Jacks.
Taylor Gue, Ltd.—84 Peel St. Springs.
Timperley, Chas.—14 Mary Ann St. Make and break plugs.

ENGLAND (Continued)

Waterson & Sons, H.—67 Albert Road, Aston. Goggles, radiators.
Westwood Tyre & Rim Co., Ltd.—89 Station St. Metallic rims.
Wolseley Tool and Motorcar Co.—Marine motors. (Wolseley and Siddeley motors.)

BRAINTREE—

Parts and Accessories Manufacturers.
Lake & Elliot.—Albion Works. Jacks.

BRISTOL—

Automobile Manufacturers, Gasolene.
Avon Motor Mfg. Co.—Keynsham. (Avon cars.)
Automobile Manufacturers, Steam Commercial.
Bristol Wagon & Carriage Works. (Trucks.)

CAMDEN TOWN, N. W.—

Automobile Manufacturers, Gasolene.
Sabella Motor Car Co. (Sabella cars.)

CHELMSFORD—

Automobile Manufacturers, Steam Commercial.
Clarkson, Ltd.—Moulsham Works. (Omnibus.)
Parts and Accessories Manufacturers.
Hoffman Mfg. Co. Ball bearings.

CLECKHEATON—

Motorcycle Manufacturers.
Phelon & Moore. (Phelon & Moore motorcycles.)

COLCHESTER—

Automobile Manufacturers, Gasolene.
Britannia Engineering Co. (Britannia cars.)

COWES (ISLE OF WIGHT)—

Automobile Manufacturers, Steam.
Liquid Fuel Engineering Co. (Lifu cars.)
Automobile Manufacturers, Steam Commercial.
Liquid Fuel Engineering Co. (Lifu trucks.)

COVENTRY—

Automobile Manufacturers, Gasolene.
Daimler Motor Co. 1904, The, Ltd. (Daimler cars.)
Deasy Motor Car Manufacturing Co., The, Ltd. (Deasy cars.)
Riley Cycle Co., The. (Riley cars.)
Rover Co., The, Ltd. (Rover cars.)
Singer Motor Co., Ltd. (Singer cars.)
Sturmey Motors, Ltd.—231 Widington Road. (Lotis cars.)
Swift Motor Co., Ltd. (Swift cars.)
Automobile Manufacturers, Gasolene Commercial.
Daimler Motor Co., The, Ltd. (Daimler cars.)
Motorcycle Manufacturers.
Bird & Co., W. Hobart. (Hobart motorcycles.)
Progress Cycle Co., Ltd.—Bishopsgate Green. (Progress motorcycles.)

ENGLAND (Continued)

Rex Motor Mfg. Co. (Rex motorcycles.)
Rover Cycle Co., Ltd. (Rover motorcycles.)
Singer Co., Ltd. (Singer motorcycles.)
Triumph Cycle Co., Ltd. (Triumph motorcycles.)
Parts and Accessories Manufacturers.
Autocar, The. Maps.
Auto-Machinery Co., Ltd. Ball bearings.
Blackham & Son.—30 High St. Goggles.
Bluemel & Bros., C. W.—Wolston. Storage batteries.
Britannia Foundry Co.—Cox St. Jacks.
Charlesworth Bodies, Ltd. Tops.
Clipper Pneumatic Tyre Co., Ltd.—Alma St. Pneumatic tires.
Coventry Chain Co., Ltd. Chains.
Forman Motor Mfg. Co.—Dayslane. Automobile motors.
Maudslay Motor Co. Marine motors.
Motor Mfg. Co., Ltd. Automobile motors.
Record Motor Co.—585 Stoneystanton Road. Automobile motors.
Riley Engine Co.—Castle Works. Transmission gears.
Roman Rim Co. Metallic rims.
Rotherham & Sons.—27 Spon St. Tire pumps, lubricators.
Rudge-Whitworth, Ltd. Metallic wheels.
United Motor Industries, Ltd.—Sherbourne Works. Batteries, horns, spark plugs, goggles, coils.
White & Poppe, Ltd. Motorcycle and automobile motors, carbureters.
Whitley Motor & Engineering Co.—Fleet St. Automobile motors.
Tricar Manufacturers.
Bird & Co., W. Hobart. (Hobart tricars and quads.)
Lagonda Motor Mfg. Co. (Lagonda tricars.)
Rex Motor Mfg. Co. (Rexette and Littette tricars.)
Riley Cycle Co., Ltd.—City Works. (Riley tricars.)
Singer Motor Co., Ltd. (Singer tricars.)

DARLASTON—

Parts and Accessories Manufacturers.
Rubery & Co. Pressed steel frames.

FLEETWOOD—

Automobile Manufacturers, Steam Commercial.
Robertson, J., & Son. (Trucks.)

GATESHEAD—

Automobile Agents and Dealers.
Galloway & Co., W. (Stanley.)

ENGLAND—London (Continued)
GODALMING (SURREY)—
Parts and Accessories Manufacturers.
 Pullman, R. & J., Ltd.—Westbrook Mills. Non-skid bands.
GREENWICH—
Parts and Accessories Manufacturers.
 Thompson & Co., T. W.—28 Deptford Bridge. Storage batteries.
HUDDERSFIELD—
Automobile Manufacturers, Gasolene.
 Roydale Engineering Co.—Trafalgar Works. (Roydale cars.)
IPSWICH—
Parts and Accessories Manufacturers.
 Ransomes, Sims & Jeffries, Ltd.—Agricultural implements.
KENSINGTON—
Automobile Manufacturers, Gasolene.
 Clément-Talbot, Ltd.—Barlby Road. (Talbot cars.)
KENTO—
Automobile Manufacturers, Steam Commercial.
 Ellis, Jesse, & Co.—Maidstone. (Trucks.)
LEICESTER—
Automobile Manufacturers, Gasolene.
 Wait & Co., G. H.—Humberston Gate. (Clyde cars.)
LEWISHAM—
Parts and Accessories Manufacturers.
 Elliot Bros.—Century Works. Speed indicators.
LEYLAND—
Automobile Manufacturers, Steam Commercial.
 Lancashire Steam Motor Co. (Leyland trucks.)
LIVERPOOL—
Automobile Manufacturers, Steam Commercial.
 Musker, C. & A.—Tunbrook. (Musker trucks.)
Parts and Accessories Manufacturers.
 Hele-Shaw Patent Clutch Co., Ltd.—36 Chatham St. Clutches.
LONDON—
Clubs and Associations.
 Aero Club of the United Kingdom.—110 Piccadilly.—E. O. Pope, Sec. (Member F. A. I.)
 Automobile Club of Great Britain and Ireland.—119 Piccadilly.
Automobile Agents and Dealers.
 Edwards Bros. (Monarch.)
 Milner-Daimler, Ltd. (Daimler.)
 Reo Motors, Ltd.—Little George St. Broad Sanctuary Westminster. (Reo.)
 White Co., The.—35 Kingly St.—Regent St. (White.)
 Winton Motor Carriage Co. (Winton.)
Automobile Manufacturers, Electric.
 British Electric Car Co., Ltd.—Oxford Court, Camden St.

ENGLAND—London (Continued)
 Ekstromer Accumulator Co.—13 Walbrook. (Ekstrom cars.)
 Electromobile Co., Ltd.—7 Curzon St. Mayfair. (Electromobile cars.)
Automobile Manufacturers, Gasolene.
 Adams Manufacturing Co.—147 Queen Victoria St. (Adams cars.)
 Ariel Motor Co., Ltd.—133 Long Acre. (Ariel cars.)
 Armstrong, Whitworth & Co., Ltd.—Great Peter St., Westminster. (Armstrong-Whitworth cars.)
 Beaufort Motor Co.—14 Baker St. (Beaufort cars.)
 Brotherhood-Crocker Motors, Ltd.—19 Hanover Square. (Brotherhood cars.)
 Edge, Ltd., Selwyn F.—14 New Burlington St. (Regent cars.)
 Euston Motor Co., Ltd.—124 Euston Road. (Courier cars.)
 Lacre Motor Car Co.—1-5 Poland St. (Lacre cars.)
 Napier Motor Co.—Acton Vale. (Napier cars.)
 New Engine Co.—Acton Vale. (N. E. C. cars.)
 Phoenix Motors, Ltd.—Blundell St. Caledonian Road. (Phoenix cars.)
 Rolls-Royce, Ltd.—14 Conduit St. (Rolls-Royce cars.)
 Straker-Squire, Ltd.—75 Shaftesbury Ave. (Straker-Squire cars.)
 Thornycroft & Co., Ltd., John I.—Homefield, Chiswick. (Thornycroft cars.)
 Weigel Motors, Ltd.—90 Goswell Rd. (Weigel cars.)
 West, Ltd.—85 Shaftesbury Ave. (West-Aster cars.)
 Withers & Co., Ltd.—35 Edgeware Road. (Withers cars.)
Automobile Manufacturers, Gasolene Commercial.
 Beaufort Motor Co.—14 Baker St. (Beaufort trucks.)
 Brush Electric Engineering Co.—Victoria Works, Belvedere Road. Lambeth. (Brush Omnibus.)
 Cadogan Motor Co.—102 Sydney St., Chelsea. (Cadogan trucks.)
 Milnes-Daimler Co., Ltd.—221 Tottenham Court. (Omnibus.)
 Straker-Squire, Ltd.—9 Bush Lane. (Straker-Squire trucks.)
Automobile Manufacturers, Steam.
 Crémorne Motor Mfg. Co.—Lotts Road, Chelsea. (Crémorne cars.)
Automobile Manufacturers, Steam Commercial.
 Thornycroft Steam Wagon Co.—Homefield, Chiswick. (Thornycroft trucks.)
Garages.
 Shippey Bros., Cheapside.—13-14 King St.

ENGLAND—London (Continued)

Motorcycle Manufacturers.

- Bat Motor Mfg. Co.—Penge. (Bat motorcycles.)
 Brown Bros., Ltd.—Great Eastern St. (Brown motorcycles.)
 Chater Lea, Ltd.—114 Golden Lane.
 Light Motors, Ltd.—180 Gray's Inn Road. (Fairy motorcycles.)
 London Auto Co.—Clapham Road.
 Phoenix Motors, Ltd.—Blundell St., Caledonian Rd. (Phoenix motorcycles.)
 Prestwich & Co., John A.—1 Landsdowne Rd., Tottenham. (J. A. P. motorcycles.)
 Service Co., Ltd.—292 High Holborn. (Service motorcycles.)
 South British Trading Co., Ltd.—15 Wilson St., Finsbury. (Vindec motorcycles.)
 Zenith Motor Engineering Co.—101 Stroud Green Road, Finsbury Park. (Zenith bicars.)

***Parts and Accessories Manufacturers.**

- Albany Engineering Co.—Goshen St. Camberwell. Circulating pumps.
 Albany Mfg. Co., Ltd.—Cumberland Park, Willesden Junction. Radiators, metallic wheels, differential gears, steering gears, springs.
 Aquascutum, Ltd.—100 Regent St. Wearing apparel, coats.
 Ariel Motors, Ltd.—101 New Bond St. Motorcycle motors.
 Atwood & Co., F.—141 Saffron Hill. Metallic rims.
 Automobilia, Ltd.—582 Oxford St. Wearing apparel, coats, pneumatic tires.
 Baker, Ltd., & Sons, Jos.—Huthe Rd., Willesden Junction. Transmission gears.
 Bowden Patents Syndicate, Ltd., E. M.—Baldwin's Gardens, Grays Inn Road. Steering gears.
 Bowen & Odery Mfg. Co.—Pomeroy St. Batteries.
 Bradley Motor Patents, Ltd.—165 Fenchurch St. Automobile motors.
 Brainsby & Sons.—125 Long Acre. Bodies.
 Bransom, Kent & Co., Ltd.—40 Great Eastern St. Horns.
 Brixton Motor Works.—283 Brixton Road. Automobile motors.
 Burberry's.—30 Haymarket. Wearing apparel, coats.
 Caves Rims, Ltd.—80 Ossory Road, Old Kent Road. Detachable rims.
 Chase Motors.—Station Road, Adderley. Automobile motors.
 Chater Lea, Ltd.—114 Golden Lane. Transmission gears.
 City Ignition Co.—14 Spencer St., Goswell Road. Spark plugs.

ENGLAND—London (Continued)

- Collier Tyres.—127 Long Acre. Pneumatic tires.
 Cowey Engineering Co.—Kew Gardens. Speed indicators.
 Cowey Engineering Co.—1 Albermarle St. Piccadilly. Gauges.
 Crémorne Motor Mfg. Co.—Lots Road, Chelsea. Automobile motors.
 Davenport & Co.—108 Hatton Garden. Speed indicators, gauges.
 Dixon Crucible Co., Joseph.—26 Victorie St. (Branch.) Graphite.
 Duffield & Funk.—3 Love Lane Eastcheap. Tire pumps.
 Dunhill, Ltd., Alfred.—2 Conduit St. Wearing apparel, coats, hats and caps. Fur coats, hats and caps. Goggles.
 East London Rubber Co.—28 Great Eastern St. Spark plugs.
 East London Rubber Co.—211 Shore-ditch. Motorcycle motors.
 Edwards Non-Skids Syndicate.—Queen Annes Chambers, Westminster. Non-skids.
 Fuller & Sons, John C.—Woodland Works.—Wick Lane Bow. Storage batteries, coils.
 Gamage, Ltd., A. W.—Holborn. Wearing apparel, fur hats, caps, and coats. Hats, caps and coats, goggles.
 Gare Patent Tyre & Wheel Co., Ltd.—15 St. Vincent St. Pneumatic tires.
 Goodrich Co., F. B.—7 Snow Hill, E. C. Tires.
 Gratze Patents & Engineering Syndicate, Ltd.—44 Whitfield St. Speed indicators.
 Hagedorn & Co., A.—12 Paul St., Finsbury. Tire pumps.
 Hooper & Co., Ltd.—Surrey Works. Blackfriars Road. Bodies, tops.
 Hopkinson & Co., Ltd., J. E.—121 Cromer St. Solid tires.
 Hora, Ltd., E. & H.—36 Peckham Road. Wood wheels, tops.
 Hunt, A. H.—115 Cannon St. Primary batteries, tire pumps.
 Hyam & Co., Ltd.—134 Oxford St. Ladies' wearing apparel, coats, hats and caps.
 Imperial Tyre & Rubber Co., Ltd.—Eagle Wharf Road. Pneumatic tires.
 Ivel Agricultural Motors, Ltd.—45 Great Marlborough St. Agricultural implements, automobile motors.
 Jackson Resilient Hub Syndicate.—32 Victoria St. Westminster. Elastic wheels.
 James & Brown, Ltd.—395 Oxford St. Clutches.
 Kensington Motor Boat Co., Ltd.—64 Avonmore Road. Marine motors.
 Lacre Motor Car Co., Ltd.—15 Poland St. Tops, bodies.

ENGLAND—London (Continued)

Lagonda Motor Co., Ltd.—Thorpe Road, Staines. Automobile motors.
 Langdon Motor Co., Ltd.—101 Southwark St. Differential gears, transmission gears.
 Lawrence & Co.—Cheapside. Radiators.
 Lawton & Co., J. A.—24 Orchard St. Oxford St. Bodies.
 Legros & Knowles.—Cumberland Park, Willesden Junction. Automobile motors.
 Light Motors, Ltd.—180 Gray's Inn Road. Motorcycle motors.
 Liverpool Rubber Co., Ltd.—292 Vauxhall Road. Pneumatic tires.
 London Scottish Rubber Co.—162 Clerkenwell Road. Non-skids, acetylene lamps.
 Lunken Valve Co.—35 Great Dover St. Carbureters.
 Marconi's Wireless Telegraph Co.—18 Finch Lane. Coils.
 Morgan & Co., Ltd.—10 Old Bond St. Tops, bodies.
 Motor Engineering Co.—15 Verulam St. Automobile motors.
 Napier Motorcar Co.—Acton Vale. Marine motors.
 New Engine Co.—Acton. Automobile and marine motors.
 Nicoll & Co., Ltd., H. J.—22 Cornhill. Wearing apparel, coats.
 Ogden & Co., E. C.—Alexander House, 56 A. Ludgate Hill. Spark plugs.
 Palmer Tyre Co., Ltd.—119 Shaftesbury Ave. Pneumatic tires.
 Parsons Non-Skid Co., Ltd.—210 Shaftesbury Ave. Non-skids.
 Pearson.—Abbot Road, Poplar. Storage batteries.
 Peto & Radford, Ltd.—100 Hatton Garden. Storage batteries.
 Philip & Son, George.—32 Fleet St. Maps.
 Piggott, Ltd., John.—Milk St., Cheapside. Goggles, wearing apparel, coats.
 Polkey.—Finsbury Pavement House. Oil lamps.
 Prested Miners Gas Indicating Electric Lamp Co., Ltd.—Albert Works, Elthorne Road, Holloway. Coils, storage batteries, electric lamps, spark plugs.
 Prestwich & Co., John A.—1 Landsdowne Rd., Tottenham. Motorcycle motors.
 Pullen & Co., F. A.—7 St. Martins Lane, Cannon St. Circulating pumps.
 Putney Motor Co., Ltd.—17 Grand Parade, Upper Richmond Road. Automobile motors.
 Richford & Co.—52 A. High Holborn. Storage batteries.

ENGLAND—London (Continued)

Robinson & Cleaver, Ltd.—Regent St. Wearing apparel, coats.
 Roots Oil Motor & Motor Car Co., Ltd.—Chichelly St., York Road, Lambeth. Automobile motors.
 Ross Courtney & Co., Ltd.—Ashbrooke Road, Upper Holloway. Lubricators, tire pumps.
 Rotax Motor & Cycle Co., Ltd.—60 Curtain Road. Acetylene lamps.
 Ryde Motors, Ltd.—Grosvenor Road, West Ealing. Automobile motors.
 Salsbury & Son, Ltd.—124 Long Acre. Acetylene lamps.
 Sawyer & Co.—Banister Road, Kensal Rise. Non-skids.
 Sayers & Co.—Vauxhall. Bodies.
 Simms Mfg. Co., Ltd.—Welbeck Works, Kimberley Road, Willesden Lane, Kilburn. High and low tension magnetos, automobile and motorcycle motors.
 Sirdar Rubber Co., Ltd.—Shirland Road. Paddington. Pneumatic tires.
 Sivan & Co., S.—172 Pentonville Road. Radiators.
 Smith, Parfrey & Co., Ltd.—Rannoch St., Fulham Palace Road. Hammer-smith. Wood wheels, springs.
 Smith & Son, Ltd., S.—9 Strand. Speed indicators.
 Swinehart Clincher Tire & Rubber Co.—117-119 Long Acre, W. C. Tires.
 Tnagent Wheels, Ltd.—Grove Road, Balham. Wood wheels.
 Temple Press, Ltd.—7 Rosebery Ave. Maps.
 Thorn, W. & F.—Ranelagh House, Lower Grosvenor Pl. Bodies.
 Tolch & Co.—Fulham. Clutches.
 Turner & Co., Ltd.—1 George St. Lisson Grove. Carbureters.
 Tyler & Sons.—Belle Isle, King's Cross. Carbureters.
 Vanderwell & Co., C. A.—Warple Way, Acton Vale. Storage batteries.
 Wilcox & Co., W. H.—23 Southwark St. Circulating pumps.
 Windham Patent Bodies.—Clapham Junction Station. Bodies.
Publications.
 Aeronautical Journal, The.—Gough Square and Bolt Court.
 Automobile & Carriage Builder's Journal.—16 Eldon St.
 Automotor Journal, The.—Pub. by F. King & Co., Ltd.—44 St. Martin's Lane. Weekly.
 Autocar, The.—20 Tudor St. Weekly.
 Car, The.—168 Piccadilly.
 Commercial Motor, The.—15 Rosebery Ave.
 Cycle and Motor Cycle Trader, Illustrated.—19 Wilson St.

ENGLAND—London (Continued)

Cycle and Motor Trades Review.—20 Tudor St.

Engineer, The.

Engineering.

Industrial Motor Review.—89 Fleet St.

Motor Boat.—7 Rosebery Ave.

Motor Car Journal.—27 Charing Cross Road.

Motor Cycle, The.—20 Tudor St.

Motoring, Illustrated.—11 Arundel St., Strand.

Motor, The.—7 Rosebery Ave.

Motor Traction.

Motor World and Industrial Vehicle Review.—73 Dunlop St.

Practical Engineer.

Royal Automobile Club Journal.—119 Piccadilly, W.

Tricar Manufacturers.

Chater Lea, Ltd.—114 Golden Lane. Quads to order.

Ivry Car & Motor Works.—15 Victoria St., Westminster. (Ivry tricycles.)

Phoenix Motors, Ltd.—Blundell St., Caledonian Road. (Phoenix Trimco, Phoenix Quad.)

Prestwich & Co., John A.—1 Landsdowne Road, Tottenham. (J. A. P. quads.)

Zenith Motor Engineering Co. (Zenith tricycles and quads.)

LOWESTOFT—

Automobile Manufacturers, Gasolene.

Brooke & Co., J. W., Ltd.—Adrian Works. (Brooke cars.)

Parts and Accessories Manufacturers.

Brooke & Co., Ltd., J. W.—Adrian Works. Marine motors.

LUTON—

Automobile Manufacturers, Gasolene.

Vauxhall Motors, Ltd. (Vauxhall cars.)

MANCHESTER—

Automobile Agents and Dealers.

Wilkinson & Co., F. W. (Stanley.)

Automobile Manufacturers, Gasolene.

Belsize Motors, Ltd.—Clayton. (Belsize cars.)

Brown Bros., Ltd.—Deansgate. (Brown cars.)

Horsfall & Bickhan.—Pendleton. (Horsbick cars.)

Parts and Accessories Manufacturers.

Gorton Rubber Co., Ltd.—Cornwall St., Openshaw. Pneumatic tires.

Hans Renold.—Brook St. Chains.

Lee's Patent Spiral Tread Co.—3 Pall Mall. Non-skids.

Manchester Tyre Co.—Oxford Road. Pneumatic tires.

Moseley, David, & Sons, Ltd.—Ardwick. Pneumatic tires.

ENGLAND (Continued)

Badax Pneumatic Tyre Co., Ltd.—51 Fountain St. (Radax tires.)

Shrewsbury & Challiner Tyre Co.—Kay St., Ardwick Green. Solid tires.

Simpson & Price.—45 John Dalton St. Wearing apparel, fur coats.

Wallwork & Co., Ltd., Henry.—Roger St. Non-skids.

Ward & Goldstone.—Salford. Electric lamps, gauges.

MELKSHAM (WILTSHIRE)—

Parts and Accessories Manufacturers.

Avon India Rubber Co., Ltd. Pneumatic tires, non-skids.

NORTHAMPTON—

Parts and Accessories Manufacturers.

Grose, Ltd. Pneumatic tires, non-skids.

Mulliner, Ltd. Bodies.

NOTTINGHAM—

Automobile Manufacturers, Gasolene.

New Leader Motors, Ltd.—Aspley. (Leader cars.)

Motorcycle Manufacturers.

Raleigh Cycle Co., Ltd. (Raleigh motorcycles.)

Parts and Accessories Manufacturers.

Stareys, Ltd. Bodies.

OLDHAM—

Motorcycle Manufacturers.

Bradbury & Co., Ltd.—Wellington Works. (Bradbury motorcycles.)

PICCADILLY (LONDON)—

Automobile Agents and Dealers.

Peckham Motor Syndicate, F. W.—40 Sackville St. (Maxwell.)

PRESTON—

Automobile Manufacturers, Steam Commercial.

Coulthard & Co. (Trucks.)

REDDITCH—

Automobile Manufacturers, Gasolene.

Enfield Autocar Co. (Enfield cars.)

Motorcycle Manufacturers.

Enfield Cycle Co. (Enfield motorcycles.)

Parts and Accessories Manufacturers.

Eadie Chain Co. Ltd. Chains.

ROCHESTER—

Automobile Manufacturers, Steam Commercial.

Aveling & Porter. (A. & P. tractors.)

SALISBURY—

Automobile Manufacturers, Gasolene.

Dean & Burden Bros., Ltd. (Scout cars.)

Parts and Accessories Manufacturers.

Dean & Burden Bros. Ltd. Marine motors.

SHEFFIELD—

Parts and Accessories Manufacturers.

East London Rubber Co., Ltd.—57 Arundel St. Pneumatic tires.

ENGLAND (Continued)

Hill, E. H., Beta Works.—56 Bromfield St. Lubricators, tire pumps, circulating pumps.

ST. LEONARDS (SUSSEX)—

Parts and Accessories Manufacturers.
Eyre & Co.—Grosvenor Gardens.
Non-skids.

TUNBRIDGE WELLS—

Parts and Accessories Manufacturers.
Adams, H. Jacks.

TWICKENHAM—

Automobile Manufacturers, Gasolene.
New Orleans Motor Co., Ltd. (Orleans cars.)

WALLSALL-ON-THAMES—

Parts and Accessories Manufacturers.
Wincer & Co., C.—Brace St. Carbureters.

WARMINSTER—

Automobile Agents and Dealers.
Warminster Motor Co., Ltd.
(Wayne.)

WESTBROOK (SURREY)—

Parts and Accessories Manufacturers.
Pullman, Ltd., R. & J.—Westbrook Mills, Godalming. Leather tires.

WOLVERHAMPTON—

Automobile Manufacturers, Gasolene.
Star Engineering Co. (Star cars, Royal Starling cars.)
Sunbeam Motor Car Co., Ltd.—Upper Villiers St. (Silent Sunbeam cars.)

Automobile Manufacturers, Steam.

Turner's Motor Mfg. Co. (Turner-Miesse cars.)

Parts and Accessories Manufacturers.
Stevens Motor Mfg. Co., Ltd.—Pelham St. Motorcycle motors, automobile motors, carbureters.

WOODBIDGE—

Automobile Manufacturers, Gasolene.
Lindsay Motor Mfg. Co., Ltd., The.
(Lindsay cars.)

WORCESTER—

Parts and Accessories Manufacturers.
McNaught & Co. Bodies.

YORK—

Parts and Accessories Manufacturers.
Wales & Son. Wood wheels.

YORKSHIRE—

Automobile Manufacturers, Gasolene.
Bell Bros.—Ravensthorpe. (Bell cars.)

FRANCE

AMIENS—

Clubs and Associations.
A. C. of Picardy and Aisne.—58 Rue des Trois Cailloux. Correspondents of the A. C. F.
Parts and Accessories Manufacturers.
Daveluy, A.—19 bvd. Alsace-Lorraine. Horns.
Ropiquet, Cl.—214 rue Jules-Barni. Coils.

FRANCE (Continued)

ARGENTEUIL (SEINE-ET-OISE)—
Parts and Accessories Manufacturers.
Dunlop, Société Française des Pneumatiques. Pneumatic tires.

ARCACHON (GIRONDE)—

Parts and Accessories Manufacturers.
Couach et fils., J.—39 bvd. d'Haussez.
Marine motors.

ARCUEIL (SEINE)—

Parts and Accessories Manufacturers.
Menegaut-Basset, G.—35 ave. Laplace.
Non-skids, pneumatic rubber tires.

ASNIERES—

Parts and Accessories Manufacturers.
Pneu Jouvence.—18 rue Traversière.
Pneumatic rubber tires.

AUBENAS (ARDECHE)—

Parts and Accessories Manufacturers.
Villeneuve, U. Wearing apparel, fur coats.

AUBERVILLIERS—

Automobile Manufacturers, Gasolene Commercial.
Malicet et Blin, Établissements.—103 ave. de la République.
Parts and Accessories Manufacturers.
Malicet et Blin, Établissements.—103 ave. de la République. Transmission, differential and steering gears, ball bearings.

AUDIMCOURT (SEINE)—

Automobile Manufacturers, Gasolene.
Peugeot frères, Société Anonyme des Automobiles. (Peugeot cars.)

AUXERRE (YONNE)—

Parts and Accessories Manufacturers.
Commergnat, A. Metallic wheels.

AVIGNON—

Clubs and Associations.
A. C. Vauclusien.—Café Tailleur, Place de L'Horloge. Correspondents of the A. C. F.

BAGNOLET (SEINE)—

Parts and Accessories Manufacturers.
Guerin.—24 rue de Pantin. Metallic rims.

BAZEILLES—

Clubs and Associations.
A. C. Ardennais. Correspondents of the A. C. F.

BEAUVOIR, PAR-ST.-JEAN-FROID-MENTAL—

Parts and Accessories Manufacturers.
Roger de Montais. Transmission gears.

BELFORT—

Clubs and Associations.
A. C. of Belfort. Correspondents of the A. C. F.

BELLEGARDE—

Parts and Accessories Manufacturers.
Megevet et Cie. Radiators.

BERGERAC (DORDOGNE)—

Parts and Accessories Manufacturers.
Pauliac fils., F.—usine de Pont-St-Jean. Wood wheels.

FRANCE (Continued)

BESANÇON—

Parts and Accessories Manufacturers.
Ateliers Amstoutz et Ravel.—ave. de
Fontaine-Argent. Motorcycle and
automobile motors.

BEZIERS—

Clubs and Associations.

A. C. Biterrois. Correspondents of
the A. C. F.

BIARRITZ (BASSES-PYRENNES)

Parts and Accessories Manufacturers.
Lafitte, J. Horns.

BILLANCOURT (SEINE)—

Automobile Manufacturers, Gasolene.
Civelli de Bosch, Ltd.
Porthos, Société Generale des Auto-
mobiles.—12 rue du Dôme. (Porthos
cars.)

Rénault frères.—139 rue du Point-du-
jour. (Rénault cars.)

Parts and Accessories Manufacturers.
de Boisse, J.—85 rue Traversière.
Circulating pumps. Lubricators.

Peugeot, A., Tony Huber et Cie.—56
rue du Vieux-Pont-de-Sevres. Auto-
mobile motors.

Rénault frères.—139 rue du Point-du-
jour. Automatic starter.

Société Anonyme des Tubes et Chas-
sis Cloisonnés.—225 rue du Vieux-
Pont-de-Sevres. Metallic rims, tub-
ular frames.

BOIS-COLOMBES (SEINE)—

Parts and Accessories Manufacturers.
Loze, J. M.—11 ave. du Bel-Air.
Solid tires.

BORDEAUX—

Clubs and Associations.

A. C. Bordelais.—2 Place de la Com-
edie. Correspondents of the A. C.
F.

Automobile Manufacturers, Gasolene.
Motobloc, Société Anonyme des Auto-
mobiles.—102 rue des Vivants. (Mo-
tobloc cars.)

Automobile Manufacturers, Gasolene
Commercial.

Purrey, V.—1-31 bdv. J. J. Bosc.
(Purrey trucks, Purrey omnibus.)

Parts and Accessories Manufacturers.
Royal changement de vitesse.—15
bdv. de Strasbourg. Transmission
gears.

Royal Motor.—15 bdv. de Strasbourg.
Automobile motors.

BOULOGNE—

Automobile Manufacturers, Gasolene.
Couverchel, V.—55 quai de Boulogne.
(C. V. R. cars.)

Gobron-Brillié, Société des Auto-
mobiles.—13 quai de Boulogne. (Gob-
ron-Brillié cars.)

Parts and Accessories Manufacturers.
Le Regperton.—37 rue des Abondan-
ces. Tire filling compound.

FRANCE (Continued)

Société Americain des Carburateurs
Volcan. Carbureters.

BOURGES—

Clubs and Associations.

A. C. of the Centre.—24 Rue Notre-
Dame. Correspondents of the A.
C. F.

BREST—

Clubs and Associations.

A. C. Brestois.—18 Rue de Siam. Cor-
respondents of the A. C. F.

BRETEUIL-SUR-ITON (EURE)—

Parts and Accessories Manufacturers.
Rosse frères. Tops.

CALAIS—

Motorcycle Manufacturers.

Wacheux.—84 rue de 4 Coins.

Parts and Accessories Manufacturers.
Brampton Bros., Ltd. Chains.

CANNES—

Clubs and Associations.

A. C. of Cannes, 1 bdv. Jean-Hibert.
Correspondents of the A. C. F.

CAZOULES (DORDOGNE)—

Parts and Accessories Manufacturers.
Redon, E. Primary batteries.

CHARLEVILLE (ARDENNES)—

Parts and Accessories Manufacturers.
Froussart, G. Jacks.

CHARENTON—

Parts and Accessories Manufacturers.

Dufour jeune et fils.—22 rue de la
Cerisaie. Non-skids.

CHATENOIS (HAUT-RHIN)—

Parts and Accessories Manufacturers.
Vermot, Ch. Springs.

CHATEAU-DU-LOIRE (SARTHE)

Motorcycle Manufacturers.

Racouard-Rocher.—26 rue National.
(La Castellorienne motorcycles.)

CHAUMONT (HAUTE-MARNE)—

Parts and Accessories Manufacturers.

Meunier Bombal et Delung.—14 rue
Mareschal. Primary batteries.

CHOISY-LE-ROI (SEINE)—

Parts and Accessories Manufacturers.

Falconnet-Perodéaud. Pneumatic and
solid rubber tires.

Lotteau frères.—14 rue du Pont. Au-
tomobile motors.

CLERMONT-FERRAND—

Clubs and Associations.

A. C. of Auvergne.—18 Place de
Jaude. Correspondents of the A. C.
F.

Parts and Accessories Manufacturers.

Bergougnan, Société Generale des
Établissements. Pneumatic rubber
tires, non-skids.

Michelin et Cie.—15 rue du Nord.
Pneumatic and solid tires.

Torrilhon, Société Anonyme des Étab-
lissements. — Chamalières. Solid
tires.

FRANCE (Continued)

CLICHY (SEINE)—

Automobile Manufacturers, Gasolene.
Vulpes, Société Anonyme des Automobiles.—170 bvd. National. (Vulpes cars.)

Parts and Accessories Manufacturers.
Dubrulle, Louis.—28 bis, rue Villeneuve. Circulating pumps, lubricators.
Fulmen, Société Nouvelle de l'Accumulateur.—18 quai de Clichy. Storage batteries.

Schmidt, Société Anonyme des Accumulateurs.—10 rue Fournier. Storage batteries.

Société Française de Petit Outillage.—71 bvd. National. Ball bearings.

COLOMBES—

Automobile Manufacturers, Electric Commercial.

Compagnie Parisienne de Voitures Electriques.—bvd. de Valmy. (Krieger omnibus and trucks.)

Automobile Manufacturers, Gasolene Commercial.

Latil, Société Française de Mécanique et d'Autos. (Latil fore-carriage.)

Parts and Accessories Manufacturers.
Ateliers de Construction.—50 ave. de Normandie. (Mfg. Marine motors.)

COMPIEGNE—

Clubs and Associations.

A. C. of the Oise. Correspondents of the A. C. F.

CORBEIL (SEINE-ET-OISE)—

Automobile Manufacturers, Gasolene.
Decauville, Société Nouvelle des Etablissements. (Decauville cars.)

COURBEVOIE (SEINE)—

Automobile Manufacturers, Gasolene.
Automobile "Gem."—24 rue de Becon. (Gem cars.)

Guillemin et Cie., H.—12 rue de Metz. (Guy cars.)

Mendelssohn et Cie., Ltd., E. (Mendelssohn cars.)

Motorcycle Manufacturers.

Motocyclette Griffou.—40 rue Louis-Blanc.

Parts and Accessories Manufacturers.
Buineau, Georges.—24 rue Parmentier. Wood wheels.

Compagnie Française Westwood.—86 rue Eugène-Caron. Metallic rims.

Continental, Société Anonyme.—55 bvd. de la Mission-Marchand. Pneumatic rubber tires.

Henrique, Jean-François.—54 quai de Courbevoie. Make and break plugs, primary batteries.

Le Caoutchouc, Société Anonyme.—39 ave. Marceau. Pneumatic rubber tires.

Sider, Société Anonyme des Bandages Souples.—66 rue de la Mission-Marchand. Solid tires.

FRANCE (Continued)

Védrine et Cie., A.—7 quai de Seine. Bodies.

DARMETAL, PRÉS ROWEN (NIÈVRE)—

Parts and Accessories Manufacturers.
Curé Raoul, E. Gasse et Cie. Non-skids.

DEVILLE (ARDENNES)—

Parts and Accessories Manufacturers.
Cochaux, Emile. Radiators.

DIJON—

Clubs and Associations.

A. C. of Bourguignon.—8 Place d'Arcy. Correspondents of the A. C. F.

Automobile Manufacturers, Gasolene Commercial.

Cottureau, Etablissements.—Lentillières. (Cottureau trucks.)

Motorcycle Manufacturers.

Cottureau, Etablissements.—Lentillières. (Cottureau motorcycles.)

Parts and Accessories Manufacturers.
Cottureau, Etablissements.—Lentillières.

Tricar Manufacturers.

Cottureau, Etablissements.—Lentillières. (Cottureau tricycles.)

DOUAI—

Parts and Accessories Manufacturers.
Hanote-Dartois Veuve.—Faubourg de Valenciennes. Wood wheels.
Société des Usines des Ressorts du Nord.—10 rue St-Vaast. Springs.

DOURDAN (SEINE-ET-OISE)—

Parts and Accessories Manufacturers.
Touzelet, J. Tire pumps.

DRAGUIGNAM—

Clubs and Associations.

A. C. of the Var. Correspondents of the A. C. F.

ELBEUF—

Parts and Accessories Manufacturers.
Méron, Société de l'Antiderapatant.—38 ter rue de Paris. Non-skids.

EPINAL—

Clubs and Associations.

A. C. Vosgien.—16 rue Jeanne d'Arc. Correspondents of the A. C. F.

FÉCAMP—

Parts and Accessories Manufacturers.
Légros, René.—16 rue de l'Inundation. Automobile motors.

FERRIÉ-RE-LA-GRANDE (NORD)—

Parts and Accessories Manufacturers.
Compagnie Duplex. Automobile motors.

FONTENAY-LE-COMTE (VANDEE)

Parts and Accessories Manufacturers.
Babert et Cie., Louis.—12 rue des Jacobins. Non-skids, leather tires.

FOURCHAMBAULT (NIÈVRE)—

Automobile Manufacturers, Steam Commercial.
Magnard et Cie. (Trucks.)

FRANCE (Continued)

FRELINGHIEN (NORD)—

Parts and Accessories Manufacturers.
Knohaert. Shock absorbers.

GENNEVILLIERS (SEINE)—

Automobile Manufacturers, Gasolene.
Chénard & Walcker, Société Anonyme
des Anciens Établissements.—rue du
Moulin-de-la-Tour. (Chénard-Walcker cars.)

Automobile Manufacturers, Gasolene
Commercial.

Chénard et Walcker, Société Anonyme
des Anciens Établissements.—rue
du Moulin-de-la-Tour. (Chénard-
Walcker trucks.)

GRAND (NORD)—

Parts and Accessories Manufacturers.
Colonial Rubber, Société Anonyme.
Pneumatic rubber tires.

GRAND CROIX (LOIRE)—

Parts and Accessories Manufacturers.
Deville, E. Jacks.

GRAVIGNY (EURE)—

Parts and Accessories Manufacturers.
Usines de Sainte-Marie et Gravigny.
Société Anonyme des. Metallic
rims.

GRENOBLE—

Clubs and Associations.

A. C. Dauphinois.—6 Place de la
Halle. Correspondents of the A. C.
F.

GUIGNES-RABUTIN—

Parts and Accessories Manufacturers.
Leblond et Commun. Primary bat-
teries.

HALLUIN (NORD)—

Parts and Accessories Manufacturers.
Usines Jackson. Pneumatic rubber
tires.

HAUTMONT (NORD)—

Parts and Accessories Manufacturers.
Société Anonyme des Ateliers de
Construction, Forges et Fonderies
d'Hantmont. Pressed steel frames.
Société Française de Travaux Métal-
liques. Pressed steel frames.

HAVRE—

Automobile Manufacturers, Gasolene.
Westinghouse, Société Anonyme.—2
bvd. Sadi-Carnot. (Westinghouse
cars.)

Automobile Manufacturers, Gasolene
Commercial.

Westinghouse, Société Anonyme.
(Westinghouse omnibus.)

Parts and Accessories Manufacturers.
Brillie Automobiles, Eugene. Auto-
mobile motors.

Toutain fils, Frémy et Cie.—4 rue
Thiébaud. Automobile motors.

HIRSON (AISNE)—

Parts and Accessories Manufacturers.
Edler, X. Automobile motors.

FRANCE (Continued)

IVRY-PORT (SEINE)—

Automobile Manufacturers, Gasolene.
Brasier. Société des Automobiles
(Brasier cars.)

Motorcycle Manufacturers.

Dutemple, A.—33 rue de Seine.

Parts and Accessories Manufacturers.
Carrosserie Rhéda.—97 rue Nationale.
Bodies.

Lemoine. Springs.

Société Française des Roulements à
Billes.—70 rue Franklin. Ball bear-
ings.

JUVISY (SEINE-ET-OISE)—

Motorcycle Manufacturers.

Gand-frères.

Tricar Manufacturers.

Gand frères.

LA DEMI-LUNE (RHONE)—

Parts and Accessories Manufacturers.
Crépet, V.—Elastic wheels.

LA ROCHELLE—

Clubs and Associations.

A. C. Rochelais. Correspondents of
the A. C. F.

LE CATEAU (NORD)—

Parts and Accessories Manufacturers.
Deloffre, Auguste.—32 route de la
Gare. Circulating pumps.

LE MANS—

Clubs and Associations.

A. C. of Sarthe.—7 bvd. René-Levas-
seur. Correspondents of the A. C. F.
Automobile Manufacturers, Gasolene.
Bollée, Usines Léon. (Léon Bollée
cars.)

LE PERREUX (SEINE)—

Parts and Accessories Manufacturers.
Seheu, Ch.—bvd. d'Alsace-Lorraine.
Acetylene and oil lamps.

LEQUESNOY (NORD)—

Parts and Accessories Manufacturers.
Dutriex-Lamelin. Non-skids, shock
absorbers.

LEVALLOIS-PERRET (SEINE)—

Automobile Manufacturers, Electric.
Société Anonyme l'Électrique.—116
rue de Gravel. (Gallia cars.)

Automobile Manufacturers, Gasolene
Commercial.

Turgan, Ltd., Établissements.—96 rue
Antonin-Raynaud. (Turgan trucks.)

Automobile Manufacturers, Gasolene.
Basset et Méline.—25 rue de Courcel-
les. (Ibis cars.)

Clément-Bayard.—33 quai Michelet.
(Clément-Bayard cars.)

Fouillaron, G.—54 rue de Villers.

Hérald, Société Anonyme de Moteurs
et Automobiles.—5 rue Carnot.
(Hérald cars.)

Lacoste et Battman.—15 rue Danton.
(Lacoste cars.)

Le Métais & Co., Louis.—22 rue du
Bois. (Le Métais cars.)

FRANCE (Continued)

Automobile Manufacturers, Steam Commercial.

Turgan, Ltd., Établissements.—96 rue Antonin-Raynaud. (Turgan trucks.)

Motorcycle Manufacturers.

Motte & Co., D.—25 rue de Courcelles.

Parts and Accessories Manufacturers.

Antiderapatant Rittier.—167 bis, rue de Courcelles. Non-skids.

Ateliers de Constructions Mécaniques.—105 rue de Fazilleau. Automobile motors.

Bac et Henry.—10 rue Cavé. Coils.

Barthelat, P.—6 rue de Corneille. Leather tires, non-skids.

Baudier, Ch.—30 rue Baudin. Pressed steel frames.

Baudier, Ch.—32 rue Baudin. Radiators.

Belfoy, Simon et Cie.—68 rue de Villiers. Pneumatic tires.

Bezault, R.—16 bvd. de Villiers. Pneumatic tires, non-skids.

Botiaux et Cie.—28 rue Greffuhle. Bodies.

Buchet, Usines. Automobile motors, aeronautic motors.

Campistrou, Jean Maxime.—68 rue Marjolin. Pressed steel frames.

Chicot, S.—78 rue des Arts. Wood rims, wheels.

Compagnie Generale des Refroidisseurs Vendome.—2 rue Danton. Radiators.

Compound, Allumage Électrique. Electric lamps, spark plugs.

Despots.—150 rue Victor-Hugo. Acetylene lamps, tire pumps.

Despots.—150 rue Victor-Hugo. Radiators.

Elastes.—rue Danton. Tire filling compound.

Frétellière.—49 rue de Lorraine. Elastic wheels.

Gadot, A.—90 route de la Révolte. Storage batteries.

Galoisy, Emile.—6 passage d'Isly. Pressed steel frames.

Gillotte, G.—88 rue de Villiers. Tops. Griffault, J.—274 route de la Révolte. Tops.

Hanaire, Société des Accumulateurs.—7 rue Danton. Storage batteries. Hannyoy et fils.—39 rue Fouquet. Springs.

Hennegrave et Agnus.—30 rue Perrier. Spark plugs.

Hennegrave et Agnus.—30 rue Perrier. Storage batteries, high and low tension magnetos, make and break plugs.

Hennegrave et Agnus.—30 rue Perrière. Low and high tension magnetos, make and break plugs.

FRANCE (Continued)

Heinz.—27 rue Cavé. Storage batteries.

Herald, Société Anonyme des Moteurs et Automobiles.—7 rue Carnot. Automobile motors.

Leger et Laillault.—15 rue de Corneille. Detachable rims.

L'Huillier et Duquesne.—62 rue de Villiers. Radiators.

Lamplugh et Cie.—8 rue Ernest-Cognacq. Bodies.

Marceau, P.—10 rue Camille-Desmoulin. Make and break plugs.

Max, Société des Accumulateurs.—33 rue Perrier. Storage batteries.

Pacaud et G. Hamon.—66 rue du Bois. Leather tires.

Pneumatic Comptoir.—50 route de la Révolte. Solid tires.

Robert et Boisseau.—44 rue du Bois. Non-skids.

Rosseau.—5 rue Greffulhe. Tops.

Société Anonyme le Carbone.—12 rue de Lorraine. Primary batteries.

Société Française des Jantes Amovibles, Bonhivers.—128 rue du Bois. Detachable rims.

Société Levitas.—128 rue du Bois. Electric lamps.

Société Levitas.—128 rue du Bois. Primary batteries.

Tricar Manufacturers.

Chauvierre, E.—29 rue Chevalier.

LILLE—

Parts and Accessories Manufacturers.

Rigaud, A.—251 rue du Faubourg de Roubaix. Automobile motors.

LONS LE SAUNIER—

Clubs and Associations.

A. C. Jurassien, Maison. Devaux, Rochettes. Correspondents of the A. C. F.

LUNEVILLE—

Automobile Manufacturers, Gasolene.

De Diétrich, Société Lorraine des Anciens Établissements. (Lorraine-De Diétrich cars.)

Automobile Manufacturers, Gasolene Commercial.

De Diétrich Société Lorraine des Anciens Établissements. (De Diétrich trucks, De Diétrich omnibus.)

LUNEVILLE (PARIS)—

Automobile Manufacturers, Gasolene, Commercial.

Lacoste & Battmann.—15 rue Danton. (Lacoste cars.)

LYONS—

Clubs and Associations.

A. C. and Bicycle C. of Lyons.—2 Palais Brillet. Correspondents of the A. C. F.

A. C. of the Rhodie.—8 rue Boissac. Correspondents of the A. C. F.

FRANCE (Continued)

Automobile Manufacturers, Gasolene.
Bérliet, Automobiles.—Chemin des Quatres Maisons. (Bérliet cars.)
Cottin & Desgouttes.—place du Bachut. (Cottin and Desgouttes cars.)
De la Buire, Société Anonyme des Automobiles.—place de la Buire. (La Buire cars.)
Mieusset fils, V.—17 rue du Gazometre. (Mieusset cars.)
Pilain, Société des Automobiles.—17 Chemin Grange-Rouge. (Pilain cars.)
Rochet et Schneider, Ltd.—57 Chemin Feuillat. (Rochet-Schneider cars.)
Automobile Manufacturers, Steam Commercial.
Buffaud, Robatel et Cie.—59 Chemin de Baraban. (Tractors.)
Motorcycle Manufacturers.
Keeler-Dorian, A.—89 bis, rue Dauphiné. (K. D. motorcycles.)
Parts and Accessories Manufacturers.
Achard-Fontanel et Cie.—48 chemin Ste.-Genevieve. Bodies.
Apprin, P.—15 rue David. Radiators.
Beau et Cie., C.—171 cours Lafayette. Non-skids, leather tires.
Bérliet.—Chemin des Quatre-Maisons, Monplaisir. Automatic starters.
Burlat frères.—89 bis cours Lafayette. Marine and automobile motors.
Chavand et Cie.—119 rue Sebastien-Gryphe. Non-skids.
Daclin, H.—place de l'Abondance. Speed indicators, grade indicators.
Fournier et Pionchon.—42 bis rue de Sevastopol. Steering gears.
Gay et Bourgeois.—63 rue Louis-Blanc. Tubular frames.
Jeannerot et Perrin.—27 rue de Vendome. Non-skids.
Jourdanet, Baron et Cie.—29 Cours Lafayette, Villeurbanne. Carbureters.
Le Centaur, Société Anonyme.—208 cours Gambetta. Non-skids, pneumatic tires, automatic starters, leather tires.
Ledin, F.—30 quai de la Charité. Jacks.
Maljournal et Bourron.—11 rue Croix-Jordan. Primary batteries.
Monin, Felix.—32 rue Croix-Jordan. Acetylene lamps.
Supery, H.—13 rue Cuvier. Elastic wheels.
Vadon, C.—17 rue du Musée. Non-skids.

MARSEILLES—

Clubs and Associations.
A. C. of Marseille.—52 rue Paradis. Correspondents of the A. C. F.
Automobile Manufacturers, Gasolene Commercial.
Dufour, Société Anonyme des Camions et Moteurs.—19 rue de la Republique. (Dufour heavy trucks.)

FRANCE (Continued)

Motorcycle Manufacturers.
Loubier.—9 cours Lieutaud. (Regence motorcycles.)
Parts and Accessories Manufacturers.
De Fornier.—7 ave. de la Capelette. Non-skids.
Roberty, A.—115 rue de Rome. Horns.
MOGNOT (PUY-DE-DOME)—
Parts and Accessories Manufacturers.
Société Anonyme des Établissements Coudert. Elastic wheels.
MAHON (ARDENNES)—
Parts and Accessories Manufacturers.
Morin, Veuve. Wood rims.
MONTBÉLAIRS (DOUBS)—
Parts and Accessories Manufacturers.
Baltzinger, F. Circulating pumps.
MONTGERON (SEINE-ET-OISE)—
Motorcycle Manufacturers.
Macquart et fils et Cie.—route de Corbeil.
MONTPELLIER—
Clubs and Associations.
A. C. of Herault.—2 rue Moguelone. Correspondents of the A. C. F.
MOREZ (JURA)—
Parts and Accessories Manufacturers.
Cottet frères.—11 quai de l'Hopital. Goggles.
Cretin-Billet frères. Goggles.
Jacquemin et Cie. Goggles.
Jacquemin, J. B.—route de la Mouille. Goggles.
Jeantet, Eugene.—238 Grande Rue. Goggles.
Lacroix-Chevassne, J. Goggles.
Lamy jeune et fils. Goggles.
Tournier, les fils de. Goggles.
MOULINS (ALLIER)—
Parts and Accessories Manufacturers.
Magne, Auguste. Wearing apparel, fur coats.
NANCY—
Clubs and Associations.
A. C. Lorrain.—12 Plac Stanislas. Correspondents of the A. C. F.
MANGIS (SEINE-ET-MARNE)—
Parts and Accessories Manufacturers.
Herluison, Clément.—route de Paris. Automobile motors.
NANTES—
Parts and Accessories Manufacturers.
Briest.—119 rue de Rennes. Carbureters.
Hersant et Rousseau.—1 rue Banier. Marine motors.
Lebrun et Cormerais.—10 rue Lamoricière. Radiators.
Underberg et Cie., E.—rue de Coulmiers. Marine motors.
NEMOURS (SEINE-ET-MARNE)—
Motorcycle Manufacturers.
Derozier, A. (Athena motorcycles.)

FRANCE (Continued)

NEUILLY-SUR-SEINE—

Automobile Manufacturers, Electric.
Védrine, Société Anonyme des Voitures Electriques.—59 bvd. du Chateau. (Védrine cars.)

Automobile Manufacturers, Gasolene.
Clèves, de, et Chevalier.—23 ave. du Roule. (Labor cars.)

Corré, Compagnie Française des Automobiles. (Corré cars.)

Vrard et Cie.—12 bvd. d'Asnieres. (Stabilia cars.)

Automobile Manufacturers, Gasolene Commercial.

Corré, Compagnie Française des Automobiles.—37 rue de Villiers. (Corré cars.)

Motorcycle Manufacturers.

Gentil et Cie.—4 bvd. Bourdon. (Alcyon motorcycles.)

Laforez.—155 ave. de Neuilly. (H. L. motorcycles.)

Parts and Accessories Manufacturers.

Automatic Ducasble.—5 ave. du Roule. Pneumatic tires.

Automatisme, L'.—8 bvd. d'Asnières. Carbureters.

B. G. S., Société Nouvelle des Accumulateurs.—34 rue Pierret. Storage batteries.

Borichansky.—26 rue Garnier. Radiators.

Bougie Westland.—9 rue Théophile-Gautier. Spark plugs.

Courty, A.—30 rue du Pont. Wood wheels.

Cros, J. et A. Laboureau.—12 rue des Poissonniers. Spark plugs.

Dalifol et Cie.—40 bvd. d'Asnières (Isle-de-la-Jatte). Auto and motorcycle motors, carbureters.

Dubarry, V.—25 rue Soyer. Wood wheels.

Filtz, J.—13 ave. du Roule, Automobile motors.

Houdet, Ernest.—7 bis, rue de l'Urbaïne. Wood wheels.

Invicta, Société.—5 rue Déves. Coils, storage batteries, spark plugs.

Jardet, B.—22 bvd. Bourdon. Radiators.

Laclaverie et Gaches.—9 rue Montrosier. Bodies.

Million, René.—53 rue de Villiers. Shock absorbers.

Neveu et Cie., J.—169 ave. du Roule. Wood wheels, wood rims, tops.

Parant frères.—59 rue Chauveau. Steering gears, transmission gears.

Quétat, J.—7 rue Boutard. Radiators.

Société Française de la Roue, E. L.—26 rue de Sablonville. Elastic wheels.

Vinet et Boulogne.—61 rue de Villiers. Bodies, wood rims, tops.

FRANCE (Continued)

Zimmerman et Cie.—22 ter, bvd. Bourdon. Bodies.

Tricar Manufacturers.

Stuart et Stichter.—20 rue d'Armenonville. (Mira tricars.)

NEUVY-SUR-LOIRE (NIÈVRE)—

Parts and Accessories Manufacturers.
Fougerat, J. S. Leather tires and rubber tires.

NICE—

Clubs and Associations.

A. C. of Nice. Correspondents of the A. C. F.

NIMES—

Clubs and Associations.

A. C. of the Gard.—1 bvd. Amiral-Courbet. Correspondents of the A. C. F.

NIORT (DEUX-SEVRES)—

Automobile Manufacturers, Gasolene.
Barré et Cie., C.—ave. de la République.

NISMES—

Parts and Accessories Manufacturers.
Monier et Martin.—63 bvd. de la République. Clutches.

NOGENT-LE-ROTRON (EURE-ET-LOIRE)—

Parts and Accessories Manufacturers.
Gallerand, H. Tops.

ORAN—

Clubs and Associations.

A. C. of Oranie.—3 bvd. Seguin. Correspondents of the A. C. F.

ORLEANS—

Parts and Accessories Manufacturers.
Bourdier-Villeve.—100 rue Bannier. Elastic wheels.

Garnier, E.—19 rue de la République. Tire pumps.

PAN—

Clubs and Associations.

A. C. Bearnais.—17 rue de la Prefecture. Correspondents of the A. C. F.

PANTIN—

Automobile Manufacturers, Steam.

Weyher et Richmond, Société Anonyme des Etablissements.—52 route d'Aubervilliers. (Weyher-Richmond cars.)

PARIS—

Clubs and Associations.

Aero Club de France.—Faubourg St. Honoré. Georges Besancon, Sec. Member, F. A. I.

Aeronautic Club of France.—58 rue Jean-Rousseau.

Automobile Association, General.—8 place de la Concorde.

Automobile Club of France.—8 place de la Concorde.

FRANCE—Paris (Continued)

Automobile Clubs Reginal of France, Federation of. 8 place de la Concorde.

Federation Aeronautique Internationale.—84 Faubourg St. Honoré. Georges Besancon, Sec. Association of the following clubs: Aero Club of America; Aero Club de France; Aero Club de Belgique; Aero Club of the United Kingdom; Aero Club Suisse; Deutscher Luftschiffer-Verband; Real Aero Club de Espana; Societa Aeronautica Italiana.

Automobile Manufacturers, Electric. Compagnie Française de Voitures, Electromobiles.—49-51 rue Cardinet. Compagnie Parisienne des Voitures Electriques.—45 bvd. Valmy. Krieger cars.)

Société Anonyme Electromotion.—54 ave. Montaigne. (S. A. E. cars.)

Automobile Manufacturers, Gasolene. Ader, Société des Automobiles.—40 ave. de Suffren. (Ader cars.)

Aigle.—65 rue de Lafayette. (Aigle cars.)

Atlas, Société des Voitures Automobiles.—101 rue de la Convention. (Atlas.)

Austral, Société Anonyme de Constructions Mécaniques d'.—8 rue du Débarcadère. (Austral cars.)

Barriquand et Marré, Société Anonyme des Ateliers.—127 rue Oberkampf. (B. and M. cars.)

Bolide, Société Anonyme des Automobiles.—5 rue Durante. (Bolide cars.)

Borderel.—135 rue de Cliqnancourt. (Cail-Borderel cars.)

Cornilleau et Sainte Beuve.—67 bvd. Bessières. (Cornilleau and Sainte Beuve cars.)

Darracq et Cie., A.—33 quai de Suresnes. (Darracq cars.)

Delage et Cie.—102 rue Baudin, Levallois. (Delage cars.)

Delahaye, Société des Automobiles.—10 rue du Banquier. (Delahaye cars.)

Delaunay-Belleville, Établissements.—St. Denis. (Delaunay-Belleville cars.)

Demeester.—22 ave. de la Grande Armée. (Demeester cars.)

E. G. A., Entrepot General d'Automobiles.—209 bvd. Péreire. (E. G. A. cars.)

Egg & Co., R.—46 rue de Lyon. (Elva cars.)

Eudelin, M.—Joinville le-pont. (Eudelin cars.)

Hurtu, Compagnie des Automobiles.—29 ave. de la Grande Armée. (Hurtu cars.)

FRANCE—Paris (Continued)

Mors, Société Anonyme d'Automobiles.—48 rue du Théâtre. (Mors cars.)

Panhard et Lavassor, Société Anonyme des Anciens Établissements.—19 ave. d'Ivry. (Panhard cars.)

Radia.—12 rue Barbès, Levallois. (Radia cars.)

Sizaire et Naudin, Société des Automobiles.—79 rue de Lourme. (Sizaire-Naudin cars.)

Automobile Manufacturers, Gasolene Commercial.

Ader, Ltd., Société des Anciens Établissements.—40 ave. de Suffren. (Ader trucks.)

Automobile Aries, Société Anonyme.—104 rue Richelieu. (Aries trucks.)

Automobile Eugene Brillié.—60 bvd. Péreire. (E. Brillié trucks.)

Automobiles Industriels, Société Generale des.—3 rue Vignon.

Campagne, E.—45 bvd. de Belleville. (Lacoin fore carriage.)

Chalboche, E.—33 rue Rodier. (Chalboche trucks.)

Cohendet et Cie., A.—166 quai Jemappes. (A. Brétin system trucks.)

Delahaye et Cie.—10 rue du Banquier. (Delahaye trucks.)

D'Espine, Achard et Cie.—52 quai de la Marne. (D. A. C. trucks.)

Guilliérme, F.—17 rue de Billancourt. (Trucks.)

Panhard et Levassor, Société Anonyme des Anciens Établissements.—19 ave. d'Ivry. (Panhard trucks.)

Peugeot, Société Anonyme des Automobiles.—83 bvd. Gouvion-St. Cyr. (Peugeot trucks.)

Renard, Société Française des Trains, 11 rue Lafayette. (Renard trains.)

Automobile Manufacturers, Steam.

Auto-Vapeur, Société L'.—116 bvd. Péreire.

Chaboche, E.—32 rue Rodier. (Chaboche cars.)

Automobile Manufacturers, Steam Commercial.

Scotte, Société des Chaudières et Voitures à Vapeur.—56 rue de Provence. (Scotte trains, omnibus, trucks.)

Motorcycle Manufacturers.

Allez frères.—2 rue Adolph-Adam.

Bara, Pascault et Riga.—35 rue Victor-Macé. (Nil Supra motorcycles.)

Boissette, Emile.—260 bvd. Voltaire. (Nala motorcycles.)

Bonnet et Zecht.—14 rue de la Vega. (Peerless motorcycles.)

Capra, M.—7 ave. de Taillebourg.

FRANCE—Paris (Continued)

Chantemède.—47 ave. de la République. (C. D. M. motorcycles.)
 Clément et Gladiator, Société Française des Cycles.—Pré-St-Gervais.
 David et Cie.—16 rue Oberkampf. (Caesar motorcycles.)
 Demeester.—22 ave. de la Grande Armée.
 Fournier, Edouard.—67 rue de Chabrol.
 Gillet, Réne, et Cie.—10 Villa Collet.
 Goyon, H.—65 ave. de la Bourdonnais.
 Grosmanin, Ch.—11 rue Doubillot.
 Guerry et Bourguignon.—116 bvd. de Grenelle.
 Herdtlé et Bruneau.—38 bis, rue de la Chine. (Herdtlé motorcycles.)
 Lotteau frères.—16 rue du Pont, Choisy-le-Roi. (Perfection motorcycles.)
 Mom, Ateliers de Constructions Mécaniques.—173 bvd. Péreire. (Mom motorcycles.)
 Radiquet, G.—97 ave. d'Italie.
 Société Industrielle d'Albert.—27 ave. de la Grande Armée. (Rochet motorcycles.)
 Société la Française.—11 rue Brunel.
 Suère.—73 rue Claude Decean.
 Syndicat Des Brevets Viratelle.—49 rue du Surmelin. (Viratelle motorcycles.)
 Terrot et Cie.
 Tragin, E.—15 rue Montalivet. (La Providence motorcycles.)
***Parts and Accessories Manufacturers.**
 Accumulateurs, T. E. M.—24 rue Folie-Méricourt. Storage batteries.
 Ader, Société Anonyme des Anciens Établissements.—40 ave. de Suffren. Marine motors.
 A. E. C., Société.—24 rue Folie-Méricourt. Spark plugs.
 Aidigier.—110 rue d'Angoulême. Spark plugs.
 Amoudruz, A.—24 rue d'Armaille. (Carbureters, radiators, circulating and tire pumps.)
 Amy's Patent.—3 rue du Pas-de-la-Mule. Shock absorbers.
 Argus Chenu.—10 rue Fontaine St. Georges. Automobile motors.
 Ateliers Amstoutz et Ravel.—ave. de Fontaine-Argent. Automobile motors.
 Autoguides Dac.—8 place de la Concorde. Maps.
 Auto-Vélo.—5 rue Poisson. Exhaust horns.
 Bailly, C.—168 bvd. de la Villette. Lubricators.
 Ballot et Cie.—105 bvd. Brune. Marine and automobile motors.
 Bara Pascault et Riga.—35 rue Victor Massé. Speed indicators, primary batteries.

FRANCE—Paris (Continued)

Barbou fils.—52 rue Montmartre. Jacks.
 Bardon, Clerc et Cie.—12 bvd. Sebastopol. Non-skids.
 Barriquand et Marre, Ateliers.—127 rue Oberkampf. Automobile motors.
 Barthelat, P.—6 rue de Corneille. Non-skids.
 Beuaion.—9 rue de Chaillot. Non-skids.
 Belle-Jardinere, Magazins de la.—2 rue du Pont Neuf. Coats, hats and caps.
 Belvalette.—21 rue Duret. Bodies.
 Bénard, E.—25 rue Louis-Dory.—Pré-St-Gervais. Leather tires.
 Benoist, H.—30 bis, rue Bergere. Spark plugs.
 Bergougnan et Cie., Société Générale des Établissements.—9 rue Villaret-de-Joyeuse. Solid tires.
 Bernard.—39 rue du Sentier. Wearing apparel, coats.
 Bernard et Patoureaux.—71 bvd. Beaumarchais. Shock absorbers.
 Berthon, P.—17 Cité Dupont. Tire pumps.
 Berton, F.—15 rue de la Cour des Noues. Horns, tire pumps.
 Besnard, Maris et Antoine.—60 bvd. Beaumarchais. Acetylene lamps.
 Besse, Louis.—39 rue de Lappe. Transmission gears.
 Bezault, R.—16 bvd. de Villiers. Non-skids.
 Bisiaux, Georges.—11 rue Petit. Radiators.
 Blériot, Société Anonyme.—14 rue Duret. Acetylene lamps.
 Blin.—53 bis, rue Croulebarde. Storage batteries.
 Blondel la Rougery.—24 passage du Havre. Maps.
 Blum, E.—130 ave. d'Orleans. Coils.
 Boas, Rodriques, et Cie.—67 bvd. de Charonne. Acetylene and oil lamps.
 Boiron, J.—32 rue de Tilsit. Spark plugs.
 Bonnet.—4 rue de la Bastille. Marine motors.
 Bon Marché.—Grands Magazins du rue de Sevres. Wearing apparel, coats.
 Bowden, Ltd., Syndicat Français des Brevets.—12 ave. de la Grande Armée. Exhaust horns.
 Boudreaux, L.—8 rue Hautefeuille. Marine motors.
 Bougie Vale.—97 rue St. Lazare. Spark plugs.
 Bourdon, Edouard.—74 faubourg du Temple. Gauges.
 Bourquin, Veuve Ferdinand.—10 cite Trevis. Speed indicators.
 Breger et Neveux.—50 rue des Marais. Ball bearings.

FRANCE—Paris (Continued)

Bréguet.—22 ave. de la Grande Armée.
Low tension magnetos.
Brunet-Loiseau frères.—13 rue des
Francs-Bourgeois. Coils.
Buchillet, P.—47 rue St. Ferdinand.
Pneumatic rubber tires, non-skids.
Buisson, Gustav-Adolph.—1 rue Ame-
lot. Tire pumps, gauges.
Carpentier, J.—20 rue Delambre.
Gauges, coils.
Caffort frères.—125 bis, rue du Che-
min Vert. Transmission gears.
Campbell.—24 passage du Havre.
Maps.
Caux et Périer.—29 ave. Parmentier.
Tire pumps.
Chauffourier, M.—10 rue de Palikao.
Carbureters.
Chauvin et Arnoux.—186 rue Cham-
pionnet. Speed indicators.
Chicot, S.—78 rue des Arts. Wood
wheels.
Cie. des Magnetos Simms-Bosch, Ltd.
—22 rue Violet. Spark plugs.
Cinogène.—36 rue des Grandes-Car-
rières. Automatic starters.
Coindet, A.—137 ave. Gambetta.
Clutches.
Cohendet et Cie., A.—166 quai Jemap-
pes. Transmission gears, steering
gears, automobile motors.
Comiot, C.—87 bvd. Gouvion-St. Cyr.
Tire pumps, horns.
Commelin, R. Vian et Cie.—45 rue
Levis. Storage batteries.
Compagnie des Magnetos Simms-
Bosch, Ltd.—22 rue Violet. Low
and high tension magnetos.
Compound, Allumage Électrique.—135
ave. de Villiers. Primary and stor-
age batteries, spark plugs.
Comptoir des Ressorts de Carrosserie.
Société Anonyme.—80 rue Taitbout.
Springs.
Comptoir d'Innovations pour Auto-
mobiles.—16 ave. de la Grande Armée.
Tire pumps, air compressors, ex-
haust whistles.
Conte, J.—38 rue des Panoyaux.
Chains.
Continental, Société Anonyme.—116
ave. Malakoff. Shock absorbers,
solid tires.
Couderc, H.—11 rue Bouret. Speed
indicators.
Couteau, H.—95 rue d'Angoulême.
Lubricators.
Crabette.—92 rue Richelieu. Wear-
ing apparel, coats.
Drevdal Binoche et Cie.—30 rue Ame-
lot. Spark plugs.
Daclin, H.—place de l'Abondance.
Grade indicators.
Dalsace, G.—23 rue Ruhmkorff. Oil
lamps.

FRANCE—Paris (Continued)

Darbilly et Cie., H.—12 rue Vincent.
Spark plugs, chains.
Dechartres, E.—3 cité des Envierges.
Marine motors.
Decoudun, J.—101 rue du Faubourg
St. Denis. Gauges.
Degaille. — 85 rue Menilmontant.
Transmission gears.
Démaretz et Cie.—208 rue St-Maur.
Horns, gauges.
Deniau et Cie.—86 bis, rue de Rome.
Wearing apparel, hats and caps.
Denich, A.—144 rue St. Maur. Acety-
lene lamps, oil lamps.
De Ploeg, S.—58 rue Michel-Bizot.
Spark plugs.
De Retz.—15 rue de Turenne. Carbur-
eters.
Desclée et Cie., J.—159 ave. Malakoff.
Non-skids.
Desponts.—150 rue Victor-Hugo.
Horns.
Drevdal, Binoche, et Cie.—30 rue
Amelot. Make and break plugs,
spark plugs.
Didier, L.—4 rue Mercœur. Make
and break plugs.
Diem, E., et R. Roëy.—62 bis, ave.
Parmentier. Acetylene and oil
lamps.
Domecq-Cazaux et Cie.—75 ave. de
Wagram. Tire pumps.
Dop.—16 rue du Débarcadère. Auto-
mobile motors.
Ducellier, G.—25 passage Dubail.
Acetylene and oil lamps.
Ducomet.—11 rue d'Abbeville. Gauges.
Dugas.—10 bvd. Sevastopol. Wearing
apparel, coats.
Dunhoelter et Schoelzel.—148 fau-
bourg St-Denis. Speed indicators.
Dupoirer, H.—48 rue Claude-Decaen.
Clutches.
Dutrieux.—Lamelin. Shock absorbers.
Dyle et Bacalan, Société Anonyme de
Travaux.—15 ave. Matignon. Pressed
steel frames.
Electro-Industrielle, Société Anon-
yme.—40 rue du Chemin-Vert.
Spark plugs.
Entrepot, Général d'Automobiles.—
211 bvd. Pereire. Automobile mo-
tors.
Établie frères et Louis Établie.—13
quai Valmy. Radiators.
Eveno, A.—22 ave. de Neuilly, Neuilly.
Carbureters.
Expert-Bezaucou.—187 rue du Cha-
teau-des-Rentiers. Storage batter-
ies.
Eymard et Cie.—19 rue Copernic.
Pneumatic rubber tires.
Fashionable House.—16 bvd. Mont-
martre. Wearing apparel, coats.
Flammer, L.—28 rue des Prairies.
Goggles.

FRANCE—Paris (Continued)

Forest et Cie., G.—32 bvd. Henri IV. Acetylene lamps, radiators.
 Forges de Douai.—52 bvd. Haussmann. Pressed steel frames, metallic wheels.
 Fougerat, J. S. Pneumatic rubber tires.
 Fraenkel.—28 rue du Quatre Septembre. Wearing apparel, coats.
 Furan, Société des Ateliers du.—4 rue Barrouin, St-Étienne. Transmission gears.
 Gianoli, L.—26 bvd. Magenta. Primary batteries, spark coils, high and low tension magnetos, coils.
 Garnier, P.—16 rue Taitbout. Speed indicators.
 Gautier, Paul.—11 rue Taine. Transmission gears. Automobile motors.
 Gérard.—36 rue des Guides-Carrières. Solid tires.
 Germé, Ch.—37 rue Godot de Mauroy. Carbureters.
 Gibaud.—309 faubourg St-Antoine. High and low tension magnetos.
 Giffard, Victor.—54 rue de Bondy. Storage batteries, high tension magnetos.
 Gillet, Réne, et Cie.—10 villa Collet, rue Didot. Motorcycle motors.
 Glaenzner et Cie.—35 bvd. Strasbourg. Differential gears.
 Godet, Edouard.—12 ave. d'Orleans. Coils.
 Goudard et Menesson.—119 rue de Montreuil. Radiators.
 Gramme, Société.—20 rue-d'Hautpoul. Storage batteries.
 Grouvelle, Arquembourg et Cie., H.—71 rue du Moulin Vert. Carbureters, radiators, circulating pumps, tire pumps.
 Guenet, J.—5 rue de Montmorency. Spark plugs, coils.
 Guerin frères.—10 rue de Laborde. Automobile motors.
 Guérot.—54 rue Daguerre. Primary batteries.
 Guide Michelin.—155 bvd. Pereire. Maps.
 Guide Routier Continental.—146 ave. Malakoff. Maps.
 Guide Vulcan.—8 place de la Concorde. Maps.
 Guyénot, J.—rue du Printemps. Lubricators.
 Guyot et Cie., Henri. Carbureters.
 Hachette et Cie.—79 bvd. Saint-Germain. Maps.
 Hamelle, H.—21 quai Valmy. Lubricators.
 Heck.—6 place Voltaire. Storage batteries.
 Henry, Lenud et Cie.—51 rue de Turanne. Electric lamps.

FRANCE—Paris (Continued)

Hirsch, E.—26 rue Crussol. Electric lamps, spark plugs, speed indicators, exhaust horns.
 Hoffer, Fr.—38 bis, rue Vivienne. Ball bearings.
 Hubeaux, F.—12 rue Montera. Acetylene lamps, oil lamps.
 Humbert, C.—12 rue des Solitaires. Goggles.
 Hussenot et Raynaud.—39 rue La Boétie. Tire pumps, lubricators, spark plugs.
 Hydra, Société Electrique.—60 bvd. de Clichy. Spark plugs, electric lamps.
 Invicta, Société.—5 rue Deves, Neuilly. Low tension magnetos.
 Jacob, Michel.—8 bvd. Voltaire. Acetylene lamps, oil lamps, horns.
 Jackson.—104 rue Oberkampf. Horns.
 James, M.—62 rue St. Antoine. Electric lamps.
 Jeantaud.—51 rue de Pouthieu. Storage batteries.
 Joly et Cie.—40 rue Pascal. Automatic starter.
 Joly, A.—123 bvd. Peréire. Jacks.
 Julien, J.—110 rue St. Maur. Clutches.
 Julien-Pingon et Cie.—54 bvd. Magenta. Detachable rims.
 Kaffel, Ch.—212 bis, bvd. Pereire. Acetylene lamps.
 Kellner et ses fils.—125 ave. Malakoff. Bodies.
 Kiel, Wilhelm.—30 rue Beaubourg. Low tension magnetos.
 Klepp, W.—54 bvd. Richard-Lenoir. Gauges.
 Kolb, Charles-Edouard.—18 place de la Chapelle. Automobile motors.
 Labitte, E.—7 rue Bordier. Spark plugs.
 Labourdette, Henri.—35 ave. des Champs Elysées. Bodies.
 Lacoste et Cie.—28 bvd. Strasbourg. High tension magnetos, coils, primary batteries, spark plugs, storage batteries, low tension magnetos.
 La Durandal.—11 bvd. de Strasbourg. Non-skids.
 Landemard, Aubert et Cie.—10 rue de Rambouillet. Detachable rims.
 Lavalette et Cie.—111 bis, bvd. Menilmontant. High and low tension magnetos.
 Lavoisier, L.—10 rue Jules-Macé. Make and break plugs.
 Lefebvre, fils, Albert.—5 rue Delteaal, Pré-St-Gervais. Circulating pumps.
 Leclanché et Cie.—158 rue Cardinet. Primary batteries.
 Lejeune, Marcel.—93 rue d'Angoulême. Clutches.
 Lemoine.—21 rue de Lappe. Wood wheels, pressed steel frames.

FRANCE—Paris (Continued)

Lérede, R.—29 rue Brunel. Spark plugs.
 L'Inviolable.—53 rue Laugier. Speed indicators.
 Liotard frères.—27 rue de Lorraine. Lubricators.
 Longuemare frères.—12 rue du Buisson-St. Louis. Carbureters, radiators.
 Lorthioy, E.—8 rue de la Voute. Radiators.
 Louvre, Grands Magazins du.—164 rue de Rivoli. Wearing apparel, coats.
 Loyal, A.—204 rue St. Maur. Radiators.
 Maison, Gérard.—15 place de la République. Wearing apparel, coats.
 Maison Talbot.—156 ave. Malakoff. Shock absorbers.
 Mambret et Cie.—25 rue de la Montagne-Ste-Genevieve. Primary batteries.
 Marcel, R.—239 bvd. Péreire. Automobile motors.
 Martin et Lethimonnier.—32 rue Felicien-David. Automobile motors.
 Maxant fils, Léon.—38 rue Belgrand. Horns, gauges.
 Max, Wormser.—25 rue Vivienne. Wearing apparel, fur coats, hats and caps.
 Merville, F., et G. Garnier.—57 bvd. Richard-Lenoir. Tops.
 Merz frères.—139 faubourg St. Denis. Goggles.
 Mestre et Blatgé.—5 rue Brunel. Horns.
 Metzeler et Cie.—1 rue Villaret-de-Joyeuse. Pneumatic rubber tires.
 Michelin et Cie.—105 bvd. Peréire. Pneumatic rubber tires, jacks, tire pumps.
 Mom, Ateliers de Constructions Mécaniques.—173 bvd. Peréire. Automobile motors.
 Mondshein, Edouard.—10 ave. Parmentier. Radiators.
 Monier, Seitert et Pommeret.—14 rue St. Maur. Metallic rims.
 Monjardet.—21 rue Richelieu. Wearing apparel, hats, caps and coats.
 Muller, Roger et Cie.—108 ave. Philippe-Auguste. Lubricators.
 Munch, J.—18 rue Rottemburg. Marine motors.
 Muneaux, Ed.—7 rue Marivaux. Springs.
 Mutel et Cie.—124 rue St-Charles. Marine and automobile motors.
 Neveu et Cie., J.—169 ave. du Roule. Wood rims, tops.
 Ney, G.—128 rue St-Maur. Roller bearing.
 Nieuport.—9 rue de Seine. Spark plugs.

FRANCE—Paris (Continued)

Nilmelior, Société d'Electricité.—47 rue Lacordaire. High and low tension magnetos, coils.
 Oger et Guérin.—36 rue Godefroy, Cavaignac. Lubricators.
 Panhard et Levassor, Société Anonyme des Anciens Etablissements.—19 ave. d'Ivry. Marine automobile motors, shock absorbers.
 Parant frères.—59 rue Chauveau. Clutches.
 Perez et Cie.—50 rue Paradis. Primary batteries, coils.
 Peugeot, A., Tony Huber et Cie.—56 rue du Vieux-Pont-de-Sevres, Billancourt. Motorcycle motors.
 Piquera, J.—108 quai Jemappes. Metallic rims.
 Pneu-Hérault.—120 bvd. Magenta. Non-skids.
 Pneumatic-Cuir Samson.—10 rue François-Prémier. Leather tires.
 Poldi, Acieres.—56 ave. Parmentier. Springs.
 Postma, J. Titus.—177 bvd. Peréire. Horns.
 Potron, Em.—29 rue Riquet. Springs.
 Ravel et Homeyer.—114 rue d'Annonay St-Etienne. Transmission gears.
 Revillon frères.—79 rue de Rivoli. Wearing apparel, coats.
 Richard, G.—108 rue St. Maur. Automobile motors.
 Roddy.—2 bvd. des Italiens. Wearing apparel, hats, caps, and coats.
 Roger-Durand.—99 bvd. Beaumarchais, non-skids, radiators, chains.
 Rollet et Cie.—67 ave. Parmentier. Lubricators, tire pumps.
 Rothschild.—131 ave. Malakoff. Bodies.
 Roue élastique, L. G.—53 bis, rue de Chateaudun. Elastic wheels.
 Roue Soleil, La.—3 square Moncey. Elastic wheels.
 Samaritaine.—Grands Magazins de la rue du Pont-Neuf. Wearing apparel, coats.
 Schaeffer et Budenberg, Société Anonyme.—105 bvd. Richard-Lenoir. Gauges.
 Schildge, E.—20 rue St-Croix-de-la-Bretonnerie. Horns.
 Schmelz, C.—40 ave. Parmentier. Differential gears, transmission gears.
 Schneider et Cie.—16 rue de la Chaussée d'Antin. Wearing apparel, coats.
 Slaverand, E., Morin successor.—48 rue de l'Aqueduc. Tire pumps, lubricators.
 Seheu, Ch.—1 bvd. d'Alsace-Lorraine. Oil lamps.
 Semmler, C.—58 rue de Paradis. Radiators.

FRANCE—Paris (Continued)

Serize et Cie., E.—6 rue Abel. Leather tires.
 Société Anonyme de la Roue a Jante. Flexible Lambert.—3 place Daumesnil. Elastic wheels.
 Société Anonyme d'Electricité et d'Automobiles Mors.—48 rue du Théâtre. Low tension magnetos, automatic starters.
 Société Anonyme des Brevets et Moteurs Letombe.—59 rue d'Amsterdam. Automobile motors.
 Société Anonyme d'Inventions Automobiles.—41 rue St.-Ferdinand. Shock absorbers.
 Société Anonyme le Centaure.—208 cours Gambetta. Leather tires, automatic starters.
 Société de Fabrication de Bandages, Demountables.—23 bvd. Gouvion-St. Cyr. Solid tires.
 Société de l'Antiderapatant, Le Bayard.—56 rue de la Roquette. Non-skids.
 Société de la Pompe Vadam.—366 rue St-Honoré. Tire pumps.
 Société d'Electricité Nilmelior.—47 rue Lacordaire. Spark plugs, primary batteries.
 Société des Jantes Amovils M. L.—52 ave. Daumesnil. Detachable rims.
 Société des Roues a Jante Creuse et Flexible, L. F.—50 bvd. de la Villette. Elastic wheels.
 Société d'Étude et d'Exploitation pour l'Industrie Automobile.—45 bvd. Haussmann. Detachable rims.
 Société du Carburateur Malzieux.—61 bvd. de Strasbourg. Carbureters.
 Société Électrique Hydra.—60 bvd. Clichy. Primary batteries.
 Société Indo-Chinoise Industrielle.—20 rue Richer. Primary batteries.
 Société Industrielle des Téléphones.—25 rue du Quatre-Septembre. Pneumatic rubber tires, jacks.
 Société La Française.—11 rue Brunel. Chains.
 Société L'Oléo.—38 rue de la Folie. Regnault. Spark plugs.
 Société Manufacturière d'Accessoires.—94 rue d'Angoulême. Exhaust horns.
 Société Parisienne.—10 ave. de la Grande Armée. Gauges.
 Société Westinghouse.—45 rue d'Arcade. Shock absorbers.
 Ström.—16 chaussée d'Atin. Wearing apparel, fur coats, hats and caps.
 Sudre fils.—17 rue Clignancourt. Horns.
 Suere.—73 rue Claude-Decaen. Motor-cycle motors.
 Taride.—18 bvd. Saint-Denis. Maps.
 Taron et Cie.—15 rue des Martyrs. Mars.

FRANCE—Paris (Continued)

Teste, E.—18 cité Lemiére, Belleville. Horns.
 Theuveny.—80 rue Taitbout. Maps.
 Thevenin frères, Seguin et Cie.—116 bvd. Richard-Lenoir. Lubricators.
 Thomet et Cie., A.—125 rue du Théâtre. Circulating pumps.
 Torchon et Meunier.—7 rue des Aca-cias. Automatic starters.
 Torrilhon, Société Anonyme des Anciens Établissements J. B.—10 Faubourg Poissonnière. Pneumatic rubber tires.
 Tourneur, C. et E.—20 rue Reaumur. Jacks.
 Vallade et Cie.—116 bvd. Peréire. Automobile motors.
 Vallée, V.—23 passage Menilmontant. Acetylene lamps.
 Vanlaethem, L.—4 rue du Débarcadère. Carbureters.
 Verdon, E.—20 rue Brunel. Solid tires.
 Vigneaux, C.—5 rue Bacon. Shock absorbers.
 Vinet Amovile, La Jante.—2 ave. de Messine. Detachable rims.
 Vinet et Boulogne.—61 ave. de Villiers. Tops.
 Wanner et Cie.—67 ave. de la République. Lubricators.
 Weill, H.—36 rue de Clery. Wearing apparel, fur hats, caps and coats.
 Welfringer et Cie., L.—9 cité de Phalsbourg. Horns and sirens.
 Westinghouse Electric Co., Ltd.—4 rue Auber. Chains.
 Williams et Cie.—1 rue Caumartin. Wearing apparel, coats.
 Windhoff frères.—100 ave. Parmentier. Radiators.
 Zedeco, Société des Accumulateurs.—97 rue Saint-Lazare. Storage batteries.

Publications—
 Aeronaute, L.—19 rue Blanche. Aeronautical publication.
 Aeronautique, L.—58 rue Jean-Jacques-Rousseau. Pub. by the Aeronautic Club of France.
 Aérophile, L.—84 rue du Faubourg Saint-Honoré. Monthly.
 Aerostation, L.—14 rue des Goncourt. Aeronautical publication.
 Aide-Mémoire de l'Automobile. Automobile law publication.
 Album des Sports.—12 rue Boule.
 Annales Industrielles et Scientifiques, Les.—66 Faubourg Montmartre.
 Annales Techniques, Les.—52 rue Saint Georges.
 Annuaire de la Carrosserie et de l'Automobile.—14 rue Lafayette. Yearbook of coach and automobile construction.

FRANCE—Paris (Continued)

Annuaire de la Route.—6 place de la Concorde.
 Annuaire de la Traction.—138 rue Amelot. Automobile directory.
 Annuaire Général des Sports Illustré.—125 rue Montmartre.
 Annuaire Général de L'Automobile.—38 bis, ave. de la Grande Armée. Automobile directory.
 Annales, Société fermière des.—35 rue Lafayette.
 Annual Baudry de Saunier.—20 rue Duret. Year book.
 Automobile L'.—7 rue Saint-Benoit.
 Automobilia.—108 bvd. de Clichy.
 Automobilia and Anglo-Saxon Herald.—108 bvd. de Clichy.
 Automotion, L'.—2 bis, rue Edouard Detaille.
 Archives Syndicades de L'Automobile et du Cycle.—23 ave. des Champs-Elysées.
 Auto, Société Anonyme du journal L'.—10 rue du Faubourg Montmartre. Daily.
 Bulletin Officiel de la Chambre Syndical de l'Automobile.—6 place de la Concorde.
 Bulletin Officiel de la Commission Technique. Official bulletin of the technical committee of the Automobile Club of France.—6 place de la Concorde.
 Chauffeur, Le.—9 rue Guénégaud.
 Comptes Rendus de l'Académie des Sciences.
 Cycle et Automobile Industriels.—9 rue Buffault.
 Industrie Vélocipédique et Automobile.—75 rue Vieille-du-Temple.
 International Motor Review, The.—30 rue de Londres.
 La France Automobile.—68 ave. de la Grande Armée.
 La Locomotion Automobile.—15 rue Bouchut.
 L'Echo des Sports.—13 rue du Faubourg Montmartre.
 L'Electricien.
 Motorcycle, Le.—56 rue Pergolèse.
 Motocyclette, La.—2 ave. Victoria.
 Omnia.—20 rue Duret.
 Petites Annales Judiciaires du Cycle et de l'Automobile, Les.—35 rue Bergère.
 Poids Lourd, Le.—1 rue Tardieu. Monthly.
 Pratique Automobile Vulgarisée, La.—101 ave. Henri-Martin.
 Revue Commercial Automobile.—75 rue d'Argenteuil.
 Revue de l'Association Générale Automobile.—8 place de la Concorde.
 Revue de Mécanique.

FRANCE—Paris (Continued)

Revue des Publications Automobiles.—27 rue Ballu.
 Revue des Transports Automobiles.—29 quai des Grands-Augustins.
 Revue du Touring Club de France.—65 ave. de la Grande Armée.
 Revue du Tourisme et des Sports.—20 rue de la Pompe.
 Revue Française de Constructions Automobiles.—34 rue de Charonne.
 Société de Publications Automobiles.—27 rue Ballu.
 Société Internationale des Electriciens, Bulletin of.
 Sports, Les.—20 rue Saint-Marc.
 Sports, Les Modernes.—24 bvd. des Capucines.
 Sport Universal Illustré, Le.—13 rue de Londres.
 Technique Automobile, La.—49 quai des Grands-Augustins.
 Tourisme, Le.—17 rue du Helder.
 Vie au Grand Air, La.—9 ave. de l'Opera.
 Vie Automobile, La.—49 quai des Grands-Augustins.
 Vie Illustrée, La.—122 rue Reaumur.
 Yachting Gazette.—41 rue Meyerbeer.
 Yacht, Le.—55 rue de Chateaudun.
Tricar Manufacturers.
 Austral, Société Anonyme l'.—8 rue du Debarcadère. (Austral.)
 Contal.—64 ave. de la Grande Armée. (Mototri-Contal.)
 Gross, J.—89 rue de la Mare. (J. O. G.)
 Heusch, Louis.—31 rue du Marché. (Lusio.)
 Mom, Ateliers de Constructions Mécaniques.—173 bvd. Péreire. (Mom.)
 Sotomayor.—19 bvd. Bourdon. (La Libellule.)
 Suère.—73 rue Claude-Decaen.

PARIS-AUTEIL—

Automobile Manufacturers, Gasolene. Martin et Lethimonnier.—32 rue Félicien-David. (Sultan cars.)

PARTHENAY (DEUX-SEVRES)—

Parts and Accessories Manufacturers. Amelot. Elastic wheels.

PERIGUEUX—

Clubs and Associations.

A. C. of Dordogne.—8 Place du Quatre, Septembre. Correspondents of the A. C. F.

PERONNE—

Parts and Accessories Manufacturers. Lecerf.—17 Faubourg de Paris. Non-skids.

PERSAN-BEUMONT (SEINE-ET-OISE)—

Parts and Accessories Manufacturers. India-Rubber, Gutta-Percha & Telegraph Works Co., Ltd. Pneumatic and solid tires.

FRANCE (Continued)

PETIT-BOURG (SEINE-ET-OISE)—
Automobile Manufacturers, Gasolene Commercial.

Decauville aîné, Société Nouvelle des Établissements. (Decauville omnibus.)

Parts and Accessories Manufacturers.
Decauville, Société Nouvelle des Établissements. Automobile motors.

PETIT-GENN-EVILLIERS (SEINE)

Parts and Accessories Manufacturers.
Société des Moteurs Gnome. Automobile motors.

PETIT-IVRY (SEINE)—

Parts and Accessories Manufacturers.
Le Phénix, Pneumatiques.—107 rue de Paris. Pneumatic rubber tires.

POISSY (SEINE-ET-OISE)—

Clubs and Associations.

A. C. Poitevin.—32 rue Carnot. Correspondents of the A. C. F.

POITIERS—

Clubs and Associations.

A. C. Poitevin.—32 rue Carnot. Correspondents of the A. C. F.

Automobile Manufacturers, Gasolene.
Grégoir Société Anonyme des Automobiles.—55 bvd. Devaux. (Grégoir cars.)

PONT-A-MOUS-ON—

Automobile Manufacturers, Gasolene Commercial.

Pantz, Ch. (Pantz trucks.)

PONTARLIER (DOUBS)—

Parts and Accessories Manufacturers.
Fabrique de Moteurs Zedel, Société Anonyme. Automobile motors.

PONT-DE-CHÉRU (ISÈRE)—

Parts and Accessories Manufacturers.
Grammont, A. Solid tires.

PRE ST-GERVAIS (SEINE)—

Automobile Manufacturers, Gasolene.
Gladiator, Société Française des Cycles et Automobiles. (Gladiator cars.)

Parts and Accessories Manufacturers.
Lefebvre fils, Albert.—5 rue Delteral. Lubricators.

PUTEAUX (SEINE)—

Automobile Manufacturers, Gasolene.
Boyer, Noé.—4 rue de Paris. (Boyer cars.)

Charron, Ltd.—7 rue Ampere. (C. G. V. cars.)

De Dion, Bouton et Cie.—quai National. (De Dion cars.)

Prunel frères, Dumas et Cie.—10 rue de Paris. (Prunel cars.)

Richard, Georges, Société des Automobiles.—1 quai National. (Unic cars.)

Vinot et Deguingand.—29 quai National. (Vinot cars.)

FRANCE (Continued)

Automobile Manufacturers, Gasolene Commercial.

De Dion, Bouton et Cie.—quai National. (De Dion cars.)

Prunel frères, Dumas et Cie.—10 rue de Paris. (Trucks.)

Rébour, J.—3 rue Ampere. (Rébour trucks.)

Usines de Puteaux, Société Anonyme.—4 rue Paris. (U. D. P. X. trucks.)

Automobile Manufacturers, Steam Commercial.

De Dion, Bouton et Cie.—quai National. (De Dion trucks, omnibus.)

Parts and Accessories Manufacturers.
Antoinette, Société.—10 rue des Bas-Rogers. Aeronautic and automobile motors.

Bozier, G.—7 rue Denis-Papin. Automobile motors, clutches, differential and transmission gears.

Briet et Cie., M.—7 rue Magenta. Lubricators.

De Dion, Bouton et Cie.—quai National. Automobile and marine motors, motorcycle motors, spark plugs.

Dinin, A.—2 quai National. Storage and primary batteries.

Jacob, F.—89 rue Arago. Leather tires.

Le Brun, C. et H. Lecomte.—14 rue Victor Hugo. Radiators.

Ramier et Mauberqué.—109 rue de Paris. Radiators.

Rebour, J.—3 rue Ampere. Automobile motors.

Sans, J. B.—10 rue de l'Oasis. Shock absorbers.

Tricar Manufacturers.

De Dion, Bouton et Cie.—quai National. (Quads, tricycles, tricars.)

REIMS—

Clubs and Associations.

A. C. of the Marne. Correspondents of the A. C. F.

Parts and Accessories Manufacturers.
Legendre, A. C. Electric horns.

REVIGNEY (MEUSE)—

Parts and Accessories Manufacturers.
Boulanger, J. Metallic wheels.

RIVE-DE-GIER (LOIRE)—

Parts and Accessories Manufacturers.
Brunon et Vallette. Pressed steel frames.

ROANNE—

Parts and Accessories Manufacturers.
Fortier-Beualieu jeune. Non-skids.

ROUBAIX—

Clubs and Associations.

A. C. of the North of France.—4 rue de La Gare. Correspondents of the A. C. F.

FRANCE (Continued)

Parts and Accessories Manufacturers.
Duvinage, Camille.—232 rue des Longues-Haies. Wood rims.

ROUEN—

Clubs and Associations.

A. C. Normand.—4 bis, bvd. d'Orleans.
Correspondents of the A. C. F.

ROUILLAC (CHARENTE)—

Parts and Accessories Manufacturers.
Girerd, M. Jacks.

ROYAT (PUY-DE-DOME)—

Parts and Accessories Manufacturers.
Yberty et Merigoux. Solid tires.

ROZIÈRES-SUR-MOUZON (VOSGES)—

Parts and Accessories Manufacturers.
Cambon fils. Ball bearings.

SALON (BOUCHE-DU-RHONE)—

Clubs and Associations.

A. C. of Salon.—Place de la Grippe.
Correspondents of the A. C. F.
Motorcycle Manufacturers.
Pasquet.—Ave. Michelet.

SAUZE-VAUS-SAIS (DEUX-SEVRES)—

Parts and Accessories Manufacturers.
Brousseau, D. Tops.

SCEAUX-ROBINSON (SEINE)—

Parts and Accessories Manufacturers.
Établissements Peltier et Thuault.—
7 ave. de Robinson. Elastic wheels.

SELONCOURT (DOUBS)—

Parts and Accessories Manufacturers.
Wyss et Cie. Clutches.

SOCHAUX, PRES MONTBELAIRD (DOUBS)—

Automobile Manufacturers, Gasolene.
Rossel et Cie. (Rossel cars.)

STRASBOURG—

Clubs and Associations.

Automobile Clubs of Alsace.—Lorraine Ohmachstrasse.
A. C. of Alsace. Correspondents of the A. C. F.

SURESNES—

Automobile Manufacturers, Steam.
Darracq-Serpollet et Cie. (Serpollet cars.)

Automobile Manufacturers, Steam Commercial.

Darracq-Serpollet et Cie. (Darracq-Serpollet trucks.)

Parts and Accessories Manufacturers.
Auto-Demarreur Lemale.—31 quai de Suresnes. Automatic starters.

Dupont, A.—36 quai de Suresnes. Horns.

Gras, Alex.—13 bvd. de Versailles.
Elastic wheels.

Nieuport.—9 rue de Seine. High tension magnetos.

Sadjal, Jante Amovile.—31 quai de Suresnes. Detachable rims.

Veziel, Fouanon et Cie.—45 rue Jean-Macé. Wood wheels.

FRANCE (Continued)

ST. ANTONIN. (TARN-ET-GARONNE)—

Parts and Accessories Manufacturers.
Plagaven et Cie., Ch. Non-skids.

ST. BRANCHS (INDRE-ET-LOIRE)

Motorcycle Manufacturers.

Besnard-Crespin. (L'Originale motorcycles.)

ST. CALAIS (SARTHE)—

Parts and Accessories Manufacturers.
Beucher, L.—rue St. Pierre. Elastic wheels.

ST. CHAMOND (LOIRE)—

Motorcycle Manufacturers.

De la Chapelle frères et Cie. (Stimula motorcycles.)

Parts and Accessories Manufacturers.
Rafer fils frères. Chains.

Stimula. Automobile motors.

ST. CHERON (SEINE-ET-OISE)—

Parts and Accessories Manufacturers.
Bouillet, Léon. Acetylene lamps.

SAINT CLOUD—

Automobile Manufacturers, Gasolene.
Gillet-Forest, Société de Construction et d'Exploitation des Automobiles
23 quai Président Carnot. (Gillet-Forest.)

Automobile Manufacturers, Gasolene Commercial.

Gillet-Forest, Société de Construction et d'Exploitation des Automobiles
23 quai de Président Carnot. (Gillet-Forest trucks.)

ST. DENIS—

Automobile Manufacturers, Gasolene.
Hotchkiss et Cie., Société Anonyme des Anciens Établissements. (Hotchkiss cars.)

Parts and Accessories Manufacturers.
Aster, Société l'. Automobile motors. motorcycle motors.

Société Anonyme des Caoutchoucs de Saint Denis.—1 rue Henri-Murger. Solid tires.

ST. ETIENNE—

Clubs and Associations.

A. C. Forezien. Correspondents of the A. C. F.

Automobile Manufacturers, Gasolene.
Armes, Cycles et Automobiles, Société Manufacturière-d'.—rue Trefilerie. (Svelte cars.)

Motorcycle Manufacturers.

Manufacture Française d'Armes et Cycles de Saint Étienne.

Société de Constructions Mécaniques de la Loire.—Chemin du Rez.

Parts and Accessories Manufacturers.
Barbier et Brandon.—112 rue d'Antony. Radiators.

Furan, Société des Ateliers du.—4 rue Barrouin. Automobile motors.

Gauthier frères.—38 rue Balay. Differential gears.

FRANCE (Continued)

Ravel et Homeyer.—114 rue d'Annonay. Steering gears.

ST. GERMAIN-EN-LAYE (SEINE-ET-OISE)

Parts and Accessories Manufacturers.
Martin, L.—place Péreire. Transmission gears.

ST. MANDÉ (SEINE)—

Parts and Accessories Manufacturers.
Dresse et Cie., J.—99 rue de la République. Differential and transmission gears.

ST. OUEN—

Parts and Accessories Manufacturers.
Abelos, H.—11 rue Raspail. Spark plugs.
Farcot frères et Cie. Automobile motors.

ST. QUENTIN—

Parts and Accessories Manufacturers.
Montauban-Marchandier, Société Anonyme des Établissements.—33 ave. Faidherbe. Automobile motors.

TARNAC (COREZE)—

Motorcycle Manufacturers.
Chazalnoël, Étienne. (L'Elau motorcycles.)

THOISSEY (AIN)—

Parts and Accessories Manufacturers.
Gay, Tony.—Wearing apparel, fur coats, hats and caps.

TOURS—

Clubs and Associations.
A. C. of Touraine.—27 rue Victor-Hugo. Correspondents of the A. C. F.

Motorcycle Manufacturers.

Bourdeaux, L.—16 ave. Grammont.
Bruneau et Cie.—12 rue Victor Hugo.

Parts and Accessories Manufacturers.
Pringent, Jules-Marie. Jacks.

Tricar Manufacturers.

Mallet, E.—10 rue Denis-Papin. (Auto-fauteuil tricars.)

TOULON—

Clubs and Associations.
A. C. of Toulon.—4 rue Corneille. Correspondents of the A. C. F.

Parts and Accessories Manufacturers.
Mauvier, M.—55 rue Picot. Detachable rims.

TOULOUSE—

Clubs and Associations.
A. C. Toulousain.—6 rue Darquier. Correspondents of A. C. F.

TROYES—

Clubs and Associations.
A. C. of the Aube.—6 rue de la Tour-Boileau. Correspondents of the A. C. F.

Motorcycle Manufacturers.

Jacquot, Georges.—30 rue de Prieze.
Knapp et Cie., Georgia.—90 rue de Prieze.

FRANCE (Continued)

TROYES (AUBE)—

Parts and Accessories Manufacturers.
Renaudin, H.—36 rue Urbain IV. Non-skids.

TURCOING—

Parts and Accessories Manufacturers.
Forges et Ateliers du Nord. Pressed steel frames.

VALENCE (DROME)—

Parts and Accessories Manufacturers.
Bouvier fils.—51 rue du Tunnel. Non-skids.

Tardy, A.—17 Faubourg Saint-Jacques. Primary batteries.

VALENTIGNY (DOUBS)—

Motorcycle Manufacturers.
Peugeot frères, les fils de. Peugeot motorcycles.)

Parts and Accessories Manufacturers.
Peugeot frères, les fils de. Chains, metallic rims, shock absorbers.

Tricar Manufacturers.

Peugeot frères, les fils de. (Peugeot quads and tricars.)

VERDUN—

Clubs and Associations.
A. C. of the Meuse. Correspondents of the A. C. F.

VERSAILLES—

Clubs and Associations.
A. C. of the Seine-et-Oise.—1 ave. de Saint-Cloud. Correspondents of the A. C. F.

Parts and Accessories Manufacturers.
Desjardin.—10 rue St. Pierre. Leather tires.

Fessoirat, E.—5 rue des Marais. Non-skids.

Publications.

Automobile en Seine-et-Oise, L'.—42 rue d'Angiviller.

VESINET (SEINE-ET-OISE)—

Parts and Accessories Manufacturers.
Chameroy, E. et A.—route de Sartrouville. Non-skids.

VIERZON (CHER)—

Automobile Manufacturers, Gasolene.
Brouhot, Usines. (Brouhot cars.)
Automobile Manufacturers, Gasolene Commercial.

Brouhot, Usines. (Brouhot trucks.)

Parts and Accessories Manufacturers.
Brouhot, Usines. Automobile motors.

VILLEFRANCHE (RHONE)—

Parts and Accessories Manufacturers.
Vermorel, V. Motorcycle motors.

VILLENEUVE-LA-GARENNE—

Automobile Manufacturers, Gasolene.
Aries, Société Anonyme des Automobiles.—39 quai d'Argenteuil. (Aries cars.)

Parts and Accessories Manufacturers.
Bellardent, A.—bvd. d'Asnières. Grade indicators.

FRANCE (Continued)

VILLIERS-SUR-MARNE (SEINE-ET-OISE)—

Parts and Accessories Manufacturers.
Stier, L.—144 rue de Paris. Metallic wheels, wood wheels, and detachable rims.

WITRY-LEZ-REIMS—

Automobile Manufacturers, Gasolene.
Société de Construction Automobile de Reims. (S. C. A. R. cars.)

GERMANY

AIX-LA-CHAPELLE—

Automobile Manufacturers, Gasolene.
Aachener Stahlwarenfabrik Actiengesellschaft. (Fafnir cars.)
Hüttis und Hardebeck.

Parts and Accessories Manufacturers.
Aachener Stahlwarenfabrik Actiengesellschaft. Automobile motors.
Heucken Söhne und Co. Non-skids.

ALTENVORDE—

Parts and Accessories Manufacturers.
Peddinghaus, Carl-Daniel. Jacks.

ALTONA—

Parts and Accessories Manufacturers.
Zornow. Wood wheels.

APOLDA—

Automobile Manufacturers, Gasolene.
Ruppe und Sohn, A. (Piccolo cars.)

AUGSBURG—

Clubs and Associations.
Augsburger Verein für Luftschiffahrt.
Augsburg Aero Club.)

BAMBERG—

Parts and Accessories Manufacturers.
Gusstahlkugelfabrik Bamberg, Heim und Co. Ball bearings.

BARMEN—

Clubs and Associations.
Niederrheinischer Verein für Luftschiffahrt. (Barmen Aero Club.)

BEIERFELD—

Parts and Accessories Manufacturers.
Frank, Albert. Electric lamps, horns, metallic rims.

BERGERHOF (RHEINISCH-PRUSSEN)—

Motorcycle Manufacturers.
Bismark Fahrradwerke Gesellschaft. (Bismark motorcycles.)

BERLIN—

Clubs and Associations.
Automobile Club of Germany (Kaiserlicher Automobil Club).—16 Leipzigerplatz.
Berliner Verein für Luftschiffahrt. (Berlin Aero Club.) Dresdenerstrasse, 38.

Automobile Manufacturers, Electric.
Krieger Automobile Aktiengesellschaft 131, Wilhelmstrasse. (Krieger cars.)
Automobile Manufacturers, Gasolene.

GERMANY (Continued)

Allgemeine Berliner Motorwagen Gesellschaft.—21 Lüneburger Strasse.
Argus Motoren-Gesellschaft.—1 Prinz Louis-Ferdinand Strasse. (Argus cars.)

Automobil u Motorenfabrik vorm. Otto Weisse u Co.—140 Greifswalderst.

Beulien u Krone.—9 Schönebergerstrasse. (Solidor cars.)

Berliner Motorwagenfabrik, G. M. B. H. Tempelhof.

Motorenfabrik Protos.—3 GROSSER Görschenstrasse. (Protos cars.)

Neue Automobil Gesellschaft.—31 Luisenstrasse. (N. A. G. cars.)

Automobile Manufacturers, Gasolene Commercial.

Cudell und Co.—Reinickensdorferstrasse 65. (Cudell trucks.)

Neue Automobil Gesellschaft. (N. A. G. cars.)

Motorcycle Manufacturers.

Cudell und Co.—46 Reinickendorferstrasse.

Motorenfabrik Magnet. Weissensee. (Magnet motorcycles.)

Schröder und Co., H. (Nikor motorcycles.)

Parts and Accessories Manufacturers.

Adam.—Leipzigerstrasse 27. Wearing apparel, fur coats, hats and caps.

Aktiengesellschaft vorm. J. Mehlich.—Sophienstrasse 21. Chains.

Argus Motoren Gesellschaft, Jeannin und Co.—Prinz Louis-Ferdinandstrasse 1. Automobile motors.

Automobil und Motorfahrzeugfabrik.—140 Greifswalderstrasse. Motorcycle and automobile motors.

Autoteile Gesellschaft.—Französischestrasse 8. High tension magnetos, clutches.

Benneckenstein, J.—Alte Jacobstrasse 139. Radiators.

Berliner Akkumulatoren-Werke.—Chausseestrasse 59, Neusilberhof.

Storage batteries.
Betzin und Werner. Goggles.

Boas, Hans.—Krautstrasse 52. High tension magnetos.

Borchers, Dr.—Waldstrasse 43. Elastic wheels.

Cudell und Co.—46 Ruckerdorferstrasse. Motorcycle motors, automobile motors.

Deutsche Samson-Leder-Pneumatik Gesellschaft.—Mittelstrasse 46. Non-skids.

Deutsche Velographfabrik Gross.—Görschenstrasse 35. Speed indicators.

Deutsche Waffen-und Munitionsfabriken.—Dorotheenstrasse 44. Ball bearings.

GERMANY (Continued)

Dressler, W.—Annenstrasse 14. Marine motors.
 Fabrik Elektrischer Apparate, Dr. Max Levy.—Chausseestrasse 2. Coils.
 Fenske, H.—Wagenbau Anstalt.—Reinickensdorferstrasse 78. Bodies.
 Freund, Gustav.—10 Georgenstrasse. Radiators.
 Gottschalk und Co.—Reinickensdorferstrasse 66. Transmission gears.
 Gross, Martin.—Louisenstrasse, 41. Goggles.
 Gründler, Max.—Liebenwalderstrasse 31. Bodies.
 Gummiwerke Oberspree.—Oberschönweide. Pneumatic tires.
 Haendler, Arthur.—Heidestrasse 52. Bodies.
 Hallada, G.—Dorotheenstrasse 22. Grade indicators.
 Herzog, Rudolph.—Breitestrasse 15. Wearing apparel, fur coats, hats and caps.
 Internationale Taxametergesellschaft.—79 Landsbergerstrasse. Speed indicators.
 Jobusch, W.—21 Nürnbergerstrasse. Horns.
 Jungmann, Felix.—Friedrichsgracht, 42. Horns, oil lamps.
 Kohler und Co., Otto.—Bülowstrasse 57. Make and break plugs.
 Küstermann, Gebrüder.—Usedomstrasse 21. Wood wheels.
 Lins Pneumatik Company.—Krausenstrasse 36. Pneumatic rubber tires.
 Maschinenfabrik Prometheus. Differential and transmission gears.
 Monning, G.—Warschauerstrasse 5. Elastic wheels.
 Motorenfabrik Magnet.—Weissensee. Motorcycle motors, automobile motors.
 Neue-Vergassergesellschaft.—Urbanstrasse 63. Carbureters.
 Palous und Beuse.—Zimmerstrasse 30. Steering gears, differential gears, circulating pumps, and lubricators.
 Pohl und Helbig.—Friedrichstrasse 225. Electric lamps.
 Rapid Akkumulatoren und Motorenwerke.—Hauptstrasse 140. Storage batteries, coils.
 Reinhold Giese.—113 Ritterstrasse. Radiators.
 Sauerbier, Franz.—5 Forsterstrasse. Radiators.
 Saxonia Akkumulatorenwerke.—30 Kreuzbergerstrasse. Storage batteries.
 Schaeffer und Oehlmann.—Chausseestrasse 46. Lubricators, circulating pumps.
 Seidelmann und Co.—Ritterstrasse 9. Storage batteries.

GERMANY (Continued)

Siecke und Schultz. Storage batteries.
 Siemens und Halske Actiengesellschaft.—94 Markgrafenstrasse. Primary batteries, coils.
 Sorge und Sabeck.—86 Mauerstrasse. W. Goggles, chains, carbureters.
 Taxameter Westendarp und Pieper.—Mauerstrasse 86. Speed indicators.
 Veit und Co., W. F.—Wagen und Karosseriefabrik.—Urbanstrasse 67. Bodies.
 Weiler, Ernst.—Blankenfelderstrasse 61. Detachable rims.
Publications.
 Allgemeine Automobil-Zeitung.—35 Deutsches, Kolonialhaus. Weekly.
 Automobil Welt.—16 Lindenstrasse.
 Motorboot, Das.—89 Lutstrasse Deutsches Kolonialhaus.
 Motorwagen, Der.—11 Kurfürtenstrasse.
BIELEFELD—
 Automobile Manufacturers, Gasolene. Dürkopp und Co. (Dürkopp cars.)
 Automobile Manufacturers, Gasolene Commercial.
 Dürkopp und Co. Actiengesellschaft. (Dürkopp trucks.)
 Motorcycle Manufacturers.
 Bielefelder Nachmaschinen und Fahrradwerke.
 Parts and Accessories Manufacturers. Blankenagel, Gebrüder. Tire pumps.
 Dürkopp und Co. Jacks.
BISMARCKHUTTE, SCHUNTOCH-LOWITZ (SILESIA)—
 Parts and Accessories Manufacturers. Bismarkhütte Actiengesellschaft. Pressed steel frames.
BRACKWEDE-BIELEFELD—
 Parts and Accessories Manufacturers. Bielefelder Press und Ziehwerke Actiengesellschaft. Pressed steel frames.
 Friedrichs und Engelking. Metallic rims.
BRANDENBERG—
 Automobile Manufacturers, Steam. Kraftzeug-Werke Gesellschaft. (Dampf cars.)
 Motorcycle Manufacturers.
 Corona Fahrradwerke und Metallindustrie Actien Gesellschaft. (Corona motorcycles.)
 Excelsior Fahrradwerke Actien Gesellschaft. (Excelsior motorcycles.)
 Parts and Accessories Manufacturers. Wagner und Co. Wagenfabrik. Bodies.
BRAUNSCHWEIG—
 Automobile Manufacturers, Gasolene Commercial.
 Bussing, H.—Elmstrasse. (Trucks.)
 Motorcycle Manufacturers.
 Braunschweiger Fahrradwerke.

GERMANY (Continued)

Parts and Accessories Manufacturers.
Braunschweiger Gummi-Export. Pneumatic rubber tires.

BUTTSTADT IM THURINGEN—

Parts and Accessories Manufacturers.
Balancemobil Werke, C. E. Buhler. Automobile motors.

CANNESTADT, BEI STUTTGART—

Parts and Accessories Manufacturers.
Eckhardt, J. C. Gauges.

CHARLOTTENBERG—

Motorcycle Manufacturers.
Progress Motoren und Apparatenbau-Gesellschaft. — 39 Wilmersdorferstrasse. (Progress motorcycles.)

COBLENZ—

Clubs and Associations.
Coblenzer Verein für Luft-Schifffahrt. (Coblenz Aero Club.)

COBURG—

Parts and Accessories Manufacturers.
Trutz, N. Bodies.

COSWIG (SAXONY)—

Tricar Manufacturers.
Nacke, E. (Nacke tricars.)

COTHEN-ANHALT—

Parts and Accessories Manufacturers.
Hoffman und Schulze. Bodies.

CRIMMITSCHAU—

Parts and Accessories Manufacturers.
Zierold, Arno. Tire pumps.

DESSAU—

Parts and Accessories Manufacturers.
Anhaltische Fahrzeugwerkstaette Krause. Jacks.

DOOS-NURNBERG—

Motorcycle Manufacturers.
Deutsche Triumph Fahrradwerke Actien Gesellschaft. (Triumph motorcycles.)
Mars Fahrradwerke Actiengesellschaft. (Mars motorcycles.)

DRESDEN—

Motorcycle Manufacturers.
Kometwerke Actiengesellschaft. (Komet motorcycles.)
Parts and Accessories Manufacturers.
Kunze und Co.—Gross-Zschachwitz. Automobile motors.
Pohle, Oskar. Bodies.
Wenzel, Gustav.—Niedersedlitz. Marine motors.

DUREN—

Parts and Accessories Manufacturers.
Vereinigte Dürener Treibriemen Fabriken. Non-skids.

DUSSELDORF—

Automobile Manufacturers, Gasolene.
Ehrhardt, Heinrich. (Ehrhardt cars.)
Automobile Manufacturers, Gasolene Commercial.
Ehrhardt, Heinrich. (Ehrhardt cars.)

EHRENFELD—

Automobile Manufacturers, Gasolene Commercial.
Helios Electricitäts Actien Gesellschaft-Köln. (Hagen trucks.)

GERMANY (Continued)

EISENACH—

Automobile Manufacturers, Gasolene.
Fahrzeugfabrik Eisenach. (Eisenach cars, Dixi cars.)
Automobile Manufacturers, Gasolene Commercial.
Fahrzeugfabrik Eisenach. (Dixi delivery wagons.)
Parts and Accessories Manufacturers.
Willss, August. Wearing apparel, fur coats.

ELBERFELD—

Parts and Accessories Manufacturers.
Siewerdt, Loewen. Non-skids.

ELSTERWERDE-BIEHLA (SAXONY)—

Motorcycle Manufacturers.
Reichenbach, Karl-Wilhelm.

ESSEN—

Parts and Accessories Manufacturers.
Krupp, Friedrich. Press steel frames.

FRANKFORT AM MAIN—

Automobile Manufacturers, Gasolene.
Adler Fahrradwerke Vorm. Heinrich Kleyer. (Adler cars.)
Motorcycle Manufacturers.
Parts and Accessories Manufacturers.
Apparatebau-Anstalt Fischer. High tension magnetos.
Frankfurter Gummiwarenfabrik, Carl Stoeckich. Pneumatic tires.
Helm, August.—10 Lützowstrasse. Jacks.
Merz, Gebrüder.—25 Weingarten, Bockenheim. Goggles.
Mitteldeutsche Gummiwarenfabrik. Louis Peter. Pneumatic rubber tires.
Solos Motoren Gesellschaft.—Gottleutstrasse 94. Automobile motors.

FULDA—

Parts and Accessories Manufacturers.
Gummiwerke Fulda. Pneumatic rubber tires.

FURTH—

Parts and Accessories Manufacturers.
Schopflochen, Ludwig. Goggles.
Schusser, Franz. Goggles.

GAGGENAU (BADEN)—

Automobile Manufacturers, Gasolene.
Bergmann Industriewerke, G. M. B. H. (Bergmann cars.)
Gaggenau, Süddeutsche Automobilfabrik. (Gaggenau cars.)
Automobile Manufacturers, Gasolene Commercial.
Süddeutsche Automobilfabrik Gaggenau. (S. A. G. trucks.)
Tricar Manufacturers.
Süddeutsche Automobilfabrik Gaggenau. (S. A. G. tricars.)

GELNHAUSEN—

Parts and Accessories Manufacturers.
Vereinigte Berlin Frankfurter Gummiwarenfabrik. Pneumatic rubber tires, solid tires.

GERMANY (Continued)

GERA-REUSS—

Parts and Accessories Manufacturers.
Traugott Golde. Tops.

GLOGAN—

Parts and Accessories Manufacturers.
Flemming, Insitut Cartographique,
Carl. Maps.

GOTHA—

Parts and Accessories Manufacturers.
Vereinigte Hanfschlauch und Gummi-
warenfabrik Actiengesellschaft.
Pneumatic rubber tires.

GRAUDENZ—

Clubs and Associations.
Ostdeutscher Verein für Luftschif-
fahrt. (Graudenz Aero Club.)

HAGEN IM WESTFALIA—

Parts and Accessories Manufacturers.
Vogel und Prein. Differential and
steering gears.
Wüppermann, Wilhelm. Chains.

HALLE-AM-SAAL—

Motorcycle Manufacturers.
Teudeloff Halloria Motorfahrzeug-
werke. (Halloria motorcycles.)

HAMBURG—

Automobile Manufacturers, Electric
Commercial.

Kruse, Gebrüder.—66 Dorotheen-
strasse. Trucks.

Automobile Manufacturers, Gasolene.
Achenbach und Co. (Hexe cars.)

Automobile Manufacturers, Steam
Commercial.

Kruse, Gebrüder.—66 Dorotheen-
strasse.

Parts and Accessories Manufacturers.
Grison und Co. Clutches.

Wedenkind, Adolph. Storage batteries.

HANAN—

Parts and Accessories Manufacturers.
Dunlop Pneumatic Tyre Co. Pneu-
matic tires.

HANOVER—

Parts and Accessories Manufacturers.
Continental Caoutchouc und Gutta-
Percha Co. Pneumatic rubber tires,
solid tires, non-skids.

Hannoverische Actiengummiwaren-
fabrik Linden. Rubber pneumatic
tires.

Hannoverische Gummikamm Co.
Pneumatic rubber tires.

Hannoverische Holzbearbeitung und
Wagonfabriken Linden. Wood rims.
Koerting, Gebrüder.—Koeringsdorf.
Automobile motors.

Körtings sleipner Motoren.—60 Ba-
denstedterst. Marine and automobile
motors.

HARBURG-AM-ELBE—

Parts and Accessories Manufacturers.
Vereinigte Gummiwarenfabriken Har-
burg-Wien. Pneumatic rubber tires.

GERMANY (Continued)

HEILBRON—

Automobile Manufacturers, Gasolene.
Heilbronner Fahrzeugfabrik.

Parts and Accessories Manufacturers.
Heilbron Fahrzeugfabrik Paul Gün-
ther. Bodies.

HOCHST-AM-MAIN—

Parts and Accessories Manufacturers.
Schmitz und Co. Circulating pumps,
carbureters.

KAISERS-LAUTERN—

Automobile Manufacturers, Gasolene.
Pfalzische Nachmaschinen und Fahr-
raeder Fabrik.

KALK BEI KOLN—

Automobile Manufacturers, Electric.
Hagen, Gottfried. (Urbanus cars.)
Automobile Manufacturers, Electric
Commercial.

Hagen, Gottfried. (Hagen trucks.)
Parts and Accessories Manufacturers.
Hagen, Gottfried. Storage batteries.

KARLSRUHE—

Parts and Accessories Manufacturers.
Lucke, Hermann. Horns.
Unterberg und Helme. High tension
magnetos.

KOETITZ BEI COSWIG (SAXONY)

Automobile Manufacturers, Gasolene.
Nacke, E. (Nacke cars.)

KOLN—

Automobile Manufacturers, Electric.
Scheel, Heinrich.—Lindentahl.

Automobile Manufacturers, Gasolene.
Motorfahrzeugfabrik Köln Gesell-
schaft.—20 Marsiliusstrasse.

Utermöhl, J. W. Gesellschaft.

Parts and Accessories Manufacturers.
Motorfahrzeugfabrik Köln.—Marsil-
iusstrasse 20. Differential gears and
transmission gears.

KIEL—

Automobile Manufacturers, Steam
Commercial.

Fried Krupp Actien Gesellschaft Ger-
mania Werft. (Krupp trucks.)

KRIEL-KOLN—

Motorcycle Manufacturers.
Köln-Lindenthaler Metallwerke Ac-
tiengesellschaft.

LIPPSTADT—

Parts and Accessories Manufacturers.
Westfälische Metallindustrie Actien-
gesellschaft. Horns, acetylene lamps.

LIEGNITZ—

Parts and Accessories Manufacturers.
Guth und Wolff. Wood wheels.

LEIPZIG-PLATWITZ—

Automobile Manufacturers, Steam
Commercial.

Hannoverische Maschinenbau Actien-
gesellschaft. (Stoltz trucks.)

Motorcycle Manufacturers.

Jubisch, Carl.—12 Weststrasse, Scho-
enfeld.

GERMANY (Continued)

Parts and Accessories Manufacturers.
Automobilwerke Leipzig.—Carl Heine
Strasse 35. Automobile motors.

Blanke und Rast. Carbureters, circulating pumps and lubricators.

Engelmann, Paul.—Delitzscherstrasse 15. Springs.

Hirzel, H. Carbureters.

Kaestner, Carl.—69 Berlinerstrasse. Tire pumps.

Klarner, Arthur.—12 Elisenstrasse. Tire pumps.

Maschinenbau Actiengesellschaft. Clutches.

Muller und Lohse.—Blumenstrasse 14. Coils.

Odor Akkumulatoren und Elementefabrik.—Schkenditz 2. Storage batteries.

Weidner, Richard. Carbureters, lubricators, circulating pumps.

LUDWIGS HAFEN (AM-RHEIN)—
Parts and Accessories Manufacturers.
Columbus Electricitäts Gesellschaft. Primary batteries.

Zimmerman, Dr. Radiators.

MAGDEBURG—
Automobile Manufacturers, Steam Commercial.

Fowler & Co., John. (Tractor.)

Motorcycle Manufacturers.

Panther Fahrradwerke, Oscar Vormbaum.

Parts and Accessories Manufacturers.
Grade Motorwerke. Automobile motors.

Klaas und Sachtleben. Coils.

Schaeffer und Budenberg. Buckau. Gauges.

MANNHEIM—
Automobile Manufacturers, Gasolene.
Benz und Cie. Rheinische Gasmotorenfabrik Actiengesellschaft. (Benz cars.)

Automobile Manufacturers, Gasolene Commercial.

Benz und Co., Rheinische Gasmotorenfabrik Actiengesellschaft. (Benz trucks.)

Parts and Accessories Manufacturers.
Benz und Co., Rheinische Gasmotorenfabrik Actiengesellschaft. Automobile motors.

Dorflingeresche Achsen und Federnfabrik Actiengesellschaft. Springs.

MARKNEUKIRCHEN (SAXONY)—
Parts and Accessories Manufacturers.
Deutsche Signalinstrumentenfabrik, Pfretzschner und Martin. Horns.

MINDEN (WESTPHALIA)—
Motorcycle Manufacturers.
Mindener Maschinen und Fahrradwerke. (Minden motorcycles.)

GERMANY (Continued)

MUENCHEN—

Clubs and Associations.

Münchener Verein für Luft-Schiffahrt. (Munich Aero Club.)

Motorcycle Manufacturers.

Joss Söhne und Co.—51 Schwanthalerstrasse. Motorcycles.

Parts and Accessories Manufacturers.
Joss Söhne und Co.—Schwanthalerstrasse 51. Automobile motors.

Publications.

Schnaufferl, Das.—Armullstrasse.

NECKARSULM (WURTEMBERG)—

Motorcycle Manufacturers.

Neckarsulmer Fahrradwerke Actiengesellschaft. (N. S. U. motorcycles.)

Parts and Accessories Manufacturers.
Neckarsulmer Fahrradwerke Actiengesellschaft. Automobile motors, motorcycle motors.

Tricar Manufacturers.

Neckarsulmer Fahrradwerke. (N. S. U. quads.)

NIEDERRAD, BEI FRANKFURT—

Parts and Accessories Manufacturers.
Stöckicht, Carl. Solid tires.

NURNBERG—

Automobile Manufacturers, Gasolene.
Express Fahrradwerke Actiengesellschaft. (Express cars.)

Motorcycle Manufacturers.

Express Fahrradwerke Actiengesellschaft Neumarkt. (Express motorcycles.)

Nürnberger Herkules Werke Actiengesellschaft.

Premier Cycle Co.

Victoriawerke Actiengesellschaft.

Parts and Accessories Manufacturers.
Chillingworth, Rud. Pressed steel frames.

Scharlach, Otto. Acetylene and oil lamps.

Weckerlein und Stöcker.—Werderstrasse 7. Make and break plugs.

OBERNBERG-AM-MAIN (BAVARIA)—

Motorcycle Manufacturers.

Volker und Prügel. (Elsava motorcycles.)

Parts and Accessories Manufacturers.
Volker und Prügel. Automobile motors.

OBERHAUSEN—

Motorcycle Manufacturers.

Heine und Wegelin.

Parts and Accessories Manufacturers.
Motorfahrzeugfabrik Heine und Weiss. Differential gears.

OBERHAMED, BEI LUDEN-SCHERD (WESTPHALIA)—

Parts and Accessories Manufacturers.
Enders, August. Chains.

GERMANY (Continued)

OBERHOMBOURG (LORRAINE)—
Parts and Accessories Manufacturers.
Gouvy et Cie. — Oberhombourg.
Springs.

OFFENBACH-AM-MAIN—
Parts and Accessories Manufacturers.
Wildmann Victor. Tire pumps.

OGERSHEIM—
Automobile Manufacturers, Electric
Commercial.
Schultze, Paul. (Trucks.)

OHIGS—
Parts and Accessories Manufacturers.
Kronprinz Aktiengesellschaft. Metal-
lic rims.
Metallwerkegesellschaft Ohligs. Metal-
lic rims.

POSEN—
Clubs and Associations.
Posener Verein für Luftschiffahrt.
(Aero Club of Posen.)

POTSDAM—
Parts and Accessories Manufacturers.
Hoffman und Co.—Neue Koenigstrasse
49. Coils.

RATIBOR (OBER-SCHLESIEEN)—
Parts and Accessories Manufacturers.
Glassner, Martin. Wood wheels and
rims.

REMSCHIED—
Parts and Accessories Manufacturers.
Friedrich Wilhelm Bertram Söhne.
Tops.

REICHENBRAND (SAXONY)—
Motorcycle Manufacturers.
Diamant Fahrradwerke. (Diamant
motorcycles.)

RHEINE-IM-WESTPHALIA—
Parts and Accessories Manufacturers.
Windhoff, Gebrüder. Carbureters, au-
tomobile motors, radiators.

RUMELSBURG BERLIN—
Parts and Accessories Manufacturers.
Schulz und Hesse. Springs.

RUSSELSHEIM AM MAIN—
Automobile Manufacturers, Gasolene.
Opel, Adam. (Opel cars.)
Motorcycle Manufacturers.
Opel, Adam. (Opel motorcycles.)

STETTIN—
Automobile Manufacturers, Electric.
Stöwer, Gebrüder. (Stöwer cars.)
Automobile Manufacturers, Gasolene.
Stöwer, Gebrüder. (Stöwer cars.)
Automobile Manufacturers, Gasolene
Commercial.
Stöwer, Gebrüder. (Stöwer cars.)

SACKSEN—
Automobile Manufacturers, Gasolene
Commercial.
Nacke, E.—Coswig. (Nacke omni-
bus.)

CHEMNITZ—
Motorcycle Manufacturers.
Prestowerke Gunther und Co., Zwick-
austrasse. (Presto motorcycles.)

GERMANY (Continued)

Parts and Accessories Manufacturers.
Baldauf, C. G.—Limbacherstrasse 37.
Springs.

Biemann, Herman. Oil and acety-
lene lamps.
Schubert, Max. Gauges.

SCHONEBECK-AM-ELBE—
Automobile Manufacturers, Gasolene
Commercial.
Siegle, Feodor. (Waren trucks.)
Motorcycle Manufacturers.
Metallindustrie Schönbeck Actienge-
sellschaft.

Parts and Accessories Manufacturers.
Lins Pneumatik Co. Non-skids.

SCHONEWORDE BEI KNESEBECK
Parts and Accessories Manufacturers.
König, H. Bodies.

SCHONAN BEI CHEMNITZ—
Motorcycle Manufacturers.
Wanderer Fahrradwerke. (Wanderer
motorcycles.)

Tricar Manufacturers.
Wanderer Fahrradwerke Actiengesell-
schaft. (Wanderer tricars.)

SCHWERTE—
Parts and Accessories Manufacturers.
Maytenecht, August. Chains.

SCHWEINFURTH—
Parts and Accessories Manufacturers.
Fichtel und Sachs. Ball bearings.
Kugelfabrik Fischer Actiengesell-
schaft. Ball bearings.
Schaeffer und Co. Ball bearings.

SOEST-IN-WESTPHALIA—
Automobile Manufacturers, Gasolene.
Westfälische Automobile Gesellschaft.

STRASBOURG (ELSASS)—
Clubs and Associations.
Deutscher Luftschiffer-Verband. (Ger-
man Aero Club.) Silbermann-
strasse 14. Maj. H. W. L. Moede-
beck, Sec. (Member F. A. I.)
Oberrheinischer Verein für Luftschif-
fahrt. (Strassburg Aero Club.)

Automobile Manufacturers, Gasolene.
Mathis, E. E. und Co.—25 Finks-
mattstrasse. (Mathis cars.)

Parts and Accessories Manufacturers.
Elsass Elektrizitätswerke, Otto
Schulze.—10 bis, rue de l'Arcen-
ciel. Speed indicators.

Publications.
Automobile, Das.—Pub. at 7 Ohmach-
strasse. Official organ of the A. C.
d'Alsace.

STUTTGART—
Parts and Accessories Manufacturers.
Behr-Zoller. Radiators.
Bosch, Robert. High tension magne-
tos.
Daucher und Mauz. Tops.
Eisemann und Co., Ernst. High and
low tension magnetos.

GERMANY (Continued)

THURINGIA-MULHAUSEN—

Motorcycle Manufacturers.

Thüringische Maschinen und Fahrradfabrik.

TREBBIN—

Parts and Accessories Manufacturers.

Hagendorfer und Werdermann. Tire pumps.

ULM—

Parts and Accessories Manufacturers.

Neue Gas Industrie. Radiators.

Neue Industriewerke. Horns.

UNTERTURCK-HEIM—

Automobile Manufacturers, Gasolene.

Daimler Motoren Gesellschaft. (Mercedes Maja cars.)

Automobile Manufacturers, Gasolene Commercial.

Daimler Motoren Gesellschaft. (Daimler cars.)

Parts and Accessories Manufacturers.

Daimler Motoren Gesellschaft. (Mercedes and Phoenix motors.)

VAREL-OLDENBURG—

Automobile Manufacturers, Gasolene.

Hansa Automobile Gesellschaft.

WALD (RHEINLAND)—

Parts and Accessories Manufacturers.

Feld, Carl. Non-skids.

WALTERSHAUSEN - IN - THURINGEN—

Parts and Accessories Manufacturers.

Waltershausen in-Thüringen. Polack, B. Pneumatic rubber tires, solid tires.

WIESBADEN—

Parts and Accessories Manufacturers.

Schönlein, P.—32 Frankfurterstrasse. Automobile motors.

WHITTEN—

Parts and Accessories Manufacturers.

Dittman und Neuhaus. Springs.

WURZBERG—

Clubs and Associations.

Fränkischer Verein für Luftschiffahrt. (Wurzburg Aero Club.)

Parts and Accessories Manufacturers.

Rockermeyer, V. Jacks.

ZITTAU—

Motorcycle Manufacturers.

Phänomen Fahrradwerke Gustav Hil-ler. (Phänomen motorcycles.)

Parts and Accessories Manufacturers.

Winter, Gustav. Bodies.

Tricar Manufacturers.

Phänomen Fahrradwerke, Gustav Hil-ler. (Phänomentricar and Phänomobil.)

ZWICKAU—

Automobile Manufacturers, Gasolene.

Horch und Co., Actien Gesellschaft. (Horch cars.)

HOLLAND

AMERSFOORT—

Automobile Manufacturers, Gasolene.

Eysink, D. H.

AMSTERDAM—

Automobile Manufacturers, Gasolene.

Spyker, Usines.—Trompenburg. (Spyker cars.)

Motorcycle Manufacturers.

Eerste Amsterdamsche Bandenrwielen & Motorrwielen Sabriek.—27 Helmerstrasse.

Machine Rijwiel en Automobielenfabriek Simplex.—Overtoom 85. (Simplex motorcycles.)

Parts and Accessories Manufacturers.

Erste Amsterdamsche Bandenfabriek, W. de Koff.—3 Helmerstraat 25. Pneumatic tires.

Van Bilderbeck, H. W.—Jakob van Campenstraat 54. Pneumatic tires.

Willink, Gebrüder.—12 Paleistraase. Marine motorcycles.

ASSEN—

Motorcycle Manufacturers.

Baakmann, Johannes.

DEVENTER—

Motorcycle Manufacturers.

Eerste Nederlandsche, Rijwiel-
fabriek.

DIEREN—

Motorcycle Manufacturers.

Arentsen und Kölling.

HAARLEM—

Motorcycle Manufacturers.

Haarlemsche Automobielen Motor-
wiel-
fabriek.—Zoete Straase.

Publications.

Auto, De.—Pub. at 5-8 Klein Heil-
land.

HAARLEMMER HOTTUIN—

Parts and Accessories Manufacturers.

Vyzelaar & Van den Bergh.—63 Am-
sterdam. Pneumatic tires.

HAGUE—

Clubs and Associations.

Automobile Club Neereandais, Nas-
saulplain.

NIMEGUEN—

Parts and Accessories Manufacturers.

Egbers, Th.—Hertogstraase 58. Bod-
ies.

RIDDERKERK—

Parts and Accessories Manufacturers.

Bakker unt Zoon. Pneumatic tires.

UTRECHT—

Motorcycle Manufacturers.

Swager.

Parts and Accessories Manufacturers.

Onland van de Kastele. Coils, make
and break plugs.

VAALS—

Parts and Accessories Manufacturers.

Wolf unt Struck. Marine motors.

WINSCHOTEN—

Motorcycle Manufacturers.

Rijwielenfabriek Gruno. (Gruno mo-
torcycles.)

HOLLAND (Continued)

ZWOLLA—

Parts and Accessories Manufacturers.
Wiener, L. Marine motors.

IRELAND

BELFAST—

Automobile Manufacturers, Gasolene.
Chambers Motors, Ltd.—Cuba St.
Works. (Chambers cars.)

ITALY

ALBINO—

Motorcycle Manufacturers.
Naris-Chiorda.—via Umberto primo.

BIELLA—

Parts and Accessories Manufacturers.
Magliola e figli.—10 via Mazzani.
Bodies.

BOLOGNA—

Automobile Manufacturers, Gasolene.
Societa Italo-Svizzera di Costruzioni Meccaniche.

BRESCIA—

Automobile Manufacturers, Gasolene.
Brixia-Züst, Fabbrica Automobili.
(Brixia-Züst cars.)

Parts and Accessories Manufacturers.
Capelli e Ca.—Corso Cavour. Bodies.

COMO—

Motorcycle Manufacturers.
Pedraglio fratelli.—28 via Milano.
Saule e Pusterla.—41 via Lecco.

FERRARE—

Clubs and Associations.
Automobile Club of Ferrare.—2 via
Teatini.

FLORENCE—

Clubs and Associations.
Automobile Club of Florence.—Via
del Prato.

Automobile Manufacturers, Gasolene.
Adami e Cie.—10 via Artisti. (Rondine cars.)

Fabbrica di Automobili Florentia.—
15 Viale in Curva. (Florentia cars.)

Automobile Manufacturers, Gasolene
Commercial.

Fabbrica di Automobili Florentia,
Societa Anonima. (Omnibus.)

Parts and Accessories Manufacturers.
Adami e Cie.—via degli Artisti. Automobile motors.

Fabbrica di Automobili "Florentia."—
via Ponte al-l'Asse. (Florentia motors.)

GAIBA—

Motorcycle Manufacturers.
Zuntini, Romeo.

GENOA—

Clubs and Associations.
Automobile Club of Genoa.—18
Spianata Acquasola.

ITALY (Continued)

Automobile Manufacturers, Gasolene.
Fabbrica Ligure di Automobili di
Genova.—2 piazza Corvetto. (F. L.
A. G. cars.)

Zena, Societa Anonima di Automobili.
—via XX Settembre. (Zena cars.)

Automobile Manufacturers, Gasolene
Commercial.

Fabbrica Ligure di Automobili di Genova,
Societa Anonima. (F. L. A. G. trucks.)

Parts and Accessories Manufacturers.
Dora, Societa Industriale Italiana.
(Dora batteries.)

Fabbrica Ligure di Automobili di Genova.—2 piazzetta Corvetto. (F. L. A. G. motors.)
Schwarz e Cia. Jacks.

LUCCA—

Motorcycle Manufacturers.
Minutoli, Millo e Cia.—15 via Giglio.
(M. M. motorcycles.)

MILAN—

Clubs and Associations.
Automobile Club of Milan.—Piazzale
Stazione Nord.

Societa Aeronautica Italiana (Italian
Aero Club). Member F. A. I.

Automobile Manufacturers, Electric.
Officine di Sesto San Giovanni, Camona e Cie.—5 via Spontini.

Automobile Manufacturers, Gasolene.
Ansaldo-Cierano.—Daniera Crocetta.
(S. P. A. cars.)

Bianchi, Ed. e Co., Fabbrica d'Automobili e Velocipedi.—21 via Nino
Bixio. (Bianchi cars.)

Isotta Fraschini, Societa Anonima.—
79 via Monte Rosa. (Isotta Fraschini cars.)

Societa Milanese Industria Meccaniche
San Cristoforo.

Züst, Roberto. (Züst cars.)

Automobile Manufacturers, Steam
Commercial.

Societa Anonima di Automobili Serpollet. (Serpollet trucks.)

Motorcycle Manufacturers.

Coppa fratelli.—3 piazzale Genova.

Frera, Societa Anonima.—33 via Carlo
Alberto. (Frera motorcycles.)

Lux, Fabbrica di Automobili e cicle.—
2 corso Valentino. (Lux motorcycles.)

Restelli.—15 a, via Disciplini.

Türkheimer.—4 via Lambro.

Parts and Accessories Manufacturers.
Carrozzeria Italiana e Cesare Sala.—
45 corso Sempione. Bodies.

Fabbrica Riuniti di Carrozzeria, C.
Castagna e Ca.—19 via Montevideo.
Bodies.

Foresti Terzo.—4 via Chiaravalle.
Coils.

Gianoli, Luigi, Filiale.—48 via Solferino. Make and break plugs.

ITALY (Continued)

Isotta Fraschini, Societa Anonima.—
79 rue Monta Rosa. Automobile
motors.

Officine Türkheimer.—4 via Lambro.
Radiators, spark plugs.

Piccoli fratelli e Ca.—via Capellari.
Lubricators.

Pirelli e Ca.—21 Ponte Seveso. Pneu-
matic tires.

Rejna, Zanardini e Ca.—39 Bastioni
Magenta. Acetylene lamps.

Societa Luigi Bellona e Ca.—1 via
Sirtori. Bodies.

Tocanier, A. e Cia.—27 Corso Genova.
Marine motors.

Vezzoni, E. Fabbrica Italiana de
Pneumatici.—15 via Torino. Pneu-
matic tires.

Züst, Roberto.—via Borgogne. Auto-
mobile motors.

Publications.

Auto, L'.—Pub. at 71 Foro Bonaparte.
Automobile, L'.—Pub. at 12 via Aure-
lio Saffi.

Gazzetta Dello Sport.—10 via Santa
Radegonda.

MOUZA (LOMBARDY)—

Parts and Accessories Manufacturers.
Hemsberger. Storage batteries.

NAPLES—

Automobile Manufacturers, Gasolene.
Hermes, Société Italienne d'Automob-
iles. (Hermes cars.)

PADUA—

Clubs and Associations.

Automobile Club of Venetien.—5 via
San Pietro.

PALERMO—

Automobile Manufacturers, Gasolene.
Cantieri Automobilistici Riuniti.—6
via Luigi Galvani. (C. A. R. cars.)

Publications.

Rapiditas.—2 via Catania.

Sicilia Sportiva.

PAVIA—

Motorcycle Manufacturers.

Aprile, Rossi e Cia.—3 via Luitprando.

PLAISANCE—

Motorcycle Manufacturers.

Marchand-Dufaux, Fabbrica Italiana
di Vetture Automobili. (Marchand-
Dufaux motorcycles.)

Parts and Accessories Manufacturers.

Marchand-Dufaux, Fabbrica Italiana
di Vettura Automobili. Motorcycle
motors, automobile motors.

Tricar Manufacturers.

Marchand-Dufaux, Fabbrica Italiana
di Vetture Automobili. (Marchand-
Dufaux tricars.)

PINEROLO—

Parts and Accessories Manufacturers.

Incerti, R. e Ca.—Villar Perosa. Ball
bearings.

ITALY (Continued)

REGGIO-EMILIA—

Motorcycle Manufacturers.

Masetti e Fontana.—7 via San Stefano.

ROME—

Automobile Manufacturers, Electric.

Societa Italiana Siemens.—337 corso
Umberto. (Siemens cars.)

**Automobile Manufacturers, Electric
Commercial.**

Cantono.—13 viale Paroli. (Cantono
fore-carriage.)

Automobile Manufacturers, Gasolene.

Officina Archimede.—57 via Flaminia.
(Archimede cars.)

Societa Fidis. (Italian Brasier cars.)

Automobile Manufacturers, Gasolene.

Societa Italiana Roma. (Omnibus.)

Motorcycle Manufacturers.

Sacripanti, G.—38 via Vincenzo.

Parts and Accessories Manufacturers.

Manifatture Martiny.—90 corso Um-
berto Primiero. Pneumatic tires.

SESTRI-PONENTE—

Automobile Manufacturers, Gasolene.

San Giorgio, Societa Italiana per Con-
struzioni di Automobili. (San Gior-
gio cars.)

TURIN—

Clubs and Associations.

Automobile Club of Italy.—5 via
Plana.

Automobile Club of Turin.—5 via
Plana.

Automobile Manufacturers, Gasolene.

Acquila, Fabbrica Italiana di Automob-
ili.—9 via Bonsignore. (Aquila
cars.)

Diatto-Clément, Societa Automobili.
—corso Frejus. (Diatto-Clément
cars.)

Fabbrica Automobili Standard.—20
corso Siccardi. (Standard cars.)

Fabbrica Italiana Automobili di Tori-
no.—35 corso Dante. (F. I. A. T.
cars.)

Itala, Societa Anonima Fabbrica di
Automobili.—29 via Petrarco. (Itala
cars.)

Junior, Fabbrica Torinese Automobili.
—56 corso M. d'Azeglio. (Junior
cars.)

Lux, Fabbrica di Automobili e Cicli.
—2 corso Valentino. (Lux cars.)

Rapid, Societa Torinese Automobili
Barriere di Nizza. (Rapid cars.)

Societa Cierano Automobili Torino.—
66 via Madama Christina. (S. C. A.
T. cars.)

Wolsit, Fabbrica di Automobili. (Wol-
sit, Italian Wolseley cars.)

**Automobile Manufacturers, Gasolene
Commercial.**

Fabbrica Italiana di Automobili di
Torino.—35 corso Dante. (F. I. A.
T. trucks.)

ITALY (Continued)

Rapid, Societa Torinese Automobili.—
Barriera di Nizza. (Rapid omnibus,
Rapid trucks.)

Motorcycle Manufacturers.

Bonnardi, Luigi.—via Piazza.—3 Cro-
cetta.

Mantovani, Carlo.—88 via Saluzzo.

Storero, Luigi.—28 corso Massino
d'Azeglio.

Parts and Accessories Manufacturers.

Allessio, Societa Anonima.—19 via
Orto Botanico. Bodies.

Aquila, Fabbrica Italiana di Automo-
bili.—9 via Bonsignore. Automobile
motors.

Carello, F. e P.—fratelli.—21 via
Berthollet. Acetylene lamps, oil
lamps.

Carrozzeria Ciocca Francesco.—26 via
della Zecca. Bodies.

Casasco, Alessandro.—19 via San Se-
condo. Wearing apparel, fur hats,
caps, coats, pneumatic tires.

Delleani, A.—12 via Moncalière. Ra-
diators.

Ernesto Ciocca del fu Giacinto.—22
via Parma. Bodies.

Fabbrica Italiana Automobili di To-
rino.—35 corso Dante. (F. I. A. T.
motors.)

Ferretti, Alfredo.—151 via del Fiori.
Circulating pumps.

Filogamo e Ca.—24 via Mille. Make
and break plugs. Non-skids.

Mégevot e Cia. Radiators.

Officina San Giorgio.—via Valperga
Caluso. Lubricators.

Officine Canavesio-Carello, Societa
Anonima.—15 corso Brescia. Horns,
acetylene lamps.

Ribetti e Colombatto.—via Bava. Au-
tomobile motors.

Rosselli.—29 via Nizza. Automobile
motors, motorcycle motors.

Societa Anonima Carrozzeria Locati
e Torressa.—Barriera di Nizza.
Bodies.

Societa Anonima Carrozzeria Lori-
nese, Rossi Russolotti.—Barriera
Bornigheri. Bodies.

Societa Carrozzeria Automobili, Ales-
sio. Bodies.

Stratta, F.—Villa Stratta Castiglione.
Elastic wheels.

Taurus, Societa Anonima por Accions.
—48 bis, via San Chiara. Bodies.

Vigo et Cie.—24 via Maria Vittoria.
Wearing apparel, coats.

Publications.

Amico dell Automobilista, L'.—Pub.
at 19 rue Maria, Vittoria.

MEXICO

AQUAS CALIENTES—

Automobile Agents and Dealers.

Morfin, Carlos. (Wayne.)

MEXICO (Continued)

Aquascalientes Lumber & Mercantile
Co. (Buick, Waltham.)

Woodworth, C. C. (Waltham.)

GUADALAJARA—

Automobile Agents and Dealers.

Collignon, Julio. (Mitchell.)

Fernandez Somellera & Stevens.
(Compound.)

Garages.

Verea, Lic Jarrer.

MERIDA, YUCATAN—

Automobile Agents and Dealers.

Escalante è Hijo, E.—Calle 63, No.
(Ford, Maxwell.)

Guerra & Co. (Northern.)

Rendon-y-Hermano, J.—Calle 63, No.
501 (Franklin, Monarch, Cameron.)

Garages.

Palamo, Domingo.—Calle 64, No. 441.

Zavala, Adolfo, S. en C.—Calle 55
esquina de 64.

MEXICO CITY—

Automobile Agents and Dealers.

Braschi, H. J. (Rainier.)

Buch, Pedro.—2 a Riviera de Santa
Maria, No. 7. (Mitchell, Compound.)

Compania Mexicana de Vehiculos
Electricos, Primer Humbolt 12.
(Locomobile, Mercedes, Panhard,
Columbia, Pope-Toledo, Pope-Hart-
ford, Cadillac, Atlas trucks, Clement-
Bayard.)

Cia Pan Americana de Vehiculos.
(Buick, Packard.)

De Rivas, T. M.—Mutual Bldg. (Na-
tional, Logan.)

Fiat Lange & Cia.—Paseo de la Re-
forma. (Fiat.)

Garage Metropolitano.—Avenida Pa-
toni y Calle Iturbide. (Darracq,
Triumph, Brasier, Itala, Cameron,
Royal, Stearns.)

Gardner & Shearer.—6 Avenida
Juarez. (Franklin.)

Mohler & De Gress.—La Independ-
encia 12. (Rapid, Thomas, Mon-
arch, Dragon, Stevens-Duryea,
Pierce Arrow.)

Parker, Wm. A.—La Independencia
12. (Elmore.)

Sanchez-Juarez & Co. (Peerless.) Gar-
age.

Vent, Eugene. (Royal.)

Garages.

Automobile Garage.—Calle del Bos-
que.

Garage Anglo-Mexicano.—Calle de
Providencio.

Meenan & Studd.—Avenida Juarez.

Sanchez Juarez & Co. (Peerless.)

Walker & Co., Samuel.

Repairing, Automobile.

Garage Italiano.—Calle de San Diego
y Colon.

MEXICO (Continued)

MICHOACAN—

Automobile Agents and Dealers.
Dante Cusi. (Wayne.)

QUERETARO—

Automobile Agents and Dealers.
Urquiza, M. M. (Holsman.)

NEW SOUTH WALES

SYDNEY—

Automobile Agents and Dealers.
Newmarch, L. A. (Lambert.)

NEW ZEALAND

CHRISTCHURCH—

Automobile Agents and Dealers.
Neeley, N. A. (Wayne.)

TIMARU—

Automobile Agents and Dealers.
Woods & Co., C. W. (Monarch.)

ROUMANIA

BUCHAREST—

Clubs and Associations.
Automobile Club Roman.—Grand Hotel du Boulevard, Boulevard Elesebeth.

RUSSIA

MOSCOW—

Clubs and Associations.
Automobile Club of Moscow.—Boulevard Novinski.

RIGA—

Parts and Accessories Manufacturers.
Gesellschaft der Russisch-Französischen Gummi-Guttapercha und Telegraphenwerke. Pneumatic tires.

ST. PETERSBURG—

Clubs and Associations.
Automobile Club of Russia.—15 Spelernaia.
Automobile Manufacturers, Gasolene.
Swronsky.—Litzeiskaia.

SCOTLAND

EDINBURGH—

Parts and Accessories Manufacturers.
Gall & Inglis. Maps.
Johnston, W. & A. K., Ltd. Maps.
North British Rubber Co., Ltd.—Castle Mills. Pneumatic tires.

GLASGOW—

Automobile Manufacturers, Gasolene.
Albion Motor Car Co., Ltd.—South St. (Albion cars.)
Argyll Motors, Ltd. (Argyll cars.)
Parts and Accessories Manufacturers.
Glasgow Motor Tyre Co.—71 Waterloo St. Non-skids.
Publications.
Motor Car World, The.—73 Dunlop St.

SCOTLAND (Continued)

PAISLEY—

Automobile Manufacturers, Gasolene.
Arrol Johnston Car Co., Ltd. (The New) Underwood. (Arrol Johnston cars.)

SOUTH WALES

LLANELLY—

Parts and Accessories Manufacturers.
Stepney Spare Motor Wheel, Ltd.
Spare wheels.

SPAIN

BARCELONA—

Clubs and Associations.
Automobile Club of Barcelona.—Rue de Rosselon.
Automobile Manufacturers, Gasolene.
Español-Suiza, Sociedad Anonima.—54 calle Floridablanca. (Birkigt cars.)
Parts and Accessories Manufacturers.
Colli y Bailo.—8 passage de la Paz.
Radiators.
Español-Suiza, Sociedad Anonima.
Automobile motors, marine motors.
Farré, J.—179 calle Aragon. Bodies.
Garcia Gomez.—22 Uyvalencia. Pneumatic tires.
Salvador Blasi.—10 calle Pelayo. Oil lamps.
Motorcycle Manufacturers.
Sanroma, Alfonso.—238 calle Aragon.
Publications.
Automovilismo Ilustrado, El.—24 Muntaner.

BARBASTRO—

Motorcycle Manufacturers.
Cyclos Zarbref.—3 calle de las Carrateral. (Zarbref motorcycles.)

BILBAO—

Automobile Manufacturers, Electric.
Artignano, G.

CADIZ—

Automobile Manufacturers, Gasolene.
Anglada.—Puerto de Santa Maria.
Parts and Accessories Manufacturers.
Badiola, M.—Puerto de Santa Maria.
Primary batteries.

GIJON—

Automobile Manufacturers, Gasolene.
Alvargonzalez. (Hormiga cars.)

GRACIA-BARCELONA—

Parts and Accessories Manufacturers.
Corominas, Ricardo.—45 Torrente de la Olla. Radiators.

MADRID—

Clubs and Associations.
Automobile Club of Spain. (Real Automobile Club de Espana.)—70 Alcala.
Real Aero Club de Espana. (Spanish Aero Club.)—Alcala 70. Member F. A. I..

SPAIN (Continued)

Motorcycle Manufacturers.

Crespo, Herman.—27 Arenal.

VITTORIA—

Automobile Manufacturers, Gasolene.
Huete.

SWEDEN

ARBRA—

Parts and Accessories Manufacturers.
Adolf Ungers Industrialstiebolag. Automobile motors.

FRITHE—

Automobile Agents and Dealers.
Karlstrom & Co. (Waltham.)

GOLEBORB—

Parts and Accessories Manufacturers.
Aktiebolagée Davy Robertsons Maskinfabrik Guldbrasen & Son. Motorcycle motors.

SOEDERTELGE—

Automobile Manufacturers, Gasolene.
Soedertelge.—Werkstaeder.

STOCKHOLM—

Clubs and Associations.
Swedish Aeronautical Society.—Capt. K. Amundsen, Sec.
Parts and Accessories Manufacturers.
Aktiebolagée Octopedmotorbiblioteks-golau. Automobile motors.

UPSALA—

Parts and Accessories Manufacturers.
Fullgarus Gjuleri & Mekineriverkstad-saktiebolag. Automobile motors.

SWITZERLAND

ARBON—

Automobile Manufacturers, Gasolene Commercial.
Saurer, Adolph. (Saurer trucks.)
Parts and Accessories Manufacturers.
Saurer, Adolph. Automatic starters.

BALE—

Motorcycle Manufacturers.
Zücker, Ph.—17 Clarastrasse.
Parts and Accessories Manufacturers.
Senn, E.—31 rue des Tanneurs. Speed indicators.

BERNE—

Parts and Accessories Manufacturers.
Ateliers des Télégraphes, G. Hasler.
Speed indicators.
Publications.
Automobil-revue.—29 boulevard Extérieur.

BIENNE—

Parts and Accessories Manufacturers.
Gyax, J. Bodies.

BIENNE-MADRETSCH—

Motorcycle Manufacturers.
Schild et Cie., B. (Cosmos motorcycles.)

BOUDRY, PRÈS NEUFCHÂTEL—

Automobile Manufacturers, Gasolene.
Société Neufchâteloise d'Automobiles. (F. Henriod Schweitzer cars.)

SWITZERLAND (Continued)

CAROUGE-GENÈVE—

Parts and Accessories Manufacturers.
Bocquet, J.—rue Jacques-Dalphin. Bodies.

COURFAIVRE—

Motorcycle Manufacturers.
Manufacture Suisse de Vélocipèdes. (Condor motorcycles.)

COUVET—

Parts and Accessories Manufacturers.
Dubied et Cie., Edouard. Spark plugs.

FRAUENFELD—

Automobile Manufacturers, Gasolene.
Martini Automobile Co., Ltd. (Martini cars.)
Automobile Manufacturers, Gasolene Commercial.
Martini Automobile Co., Ltd.

GENEVA—

Automobile Manufacturers, Electric.
Compagnie de l'Industrie Électrique et Mécanique. (Thury cars.)
Automobile Manufacturers, Gasolene.
Compagnie de l'Industrie Électrique et Mécanique. (C. I. E. M. cars.)
Picker, Moccand et Cie., L., Société Anonyme des Anciens Établissements.—78 Chêne-Bougeries. (Lucia cars.)

Motorcycle Manufacturers.

David et Cie. (La Moto-Rêve motorcycles.)
Dufaux et Cie., H. and A. (La motosacoché outfits and motorcycles.)

Parts and Accessories Manufacturers.

Bächten et Gallay. Radiators.
Bauer, A.—14 rue de Hollande. Pneumatic tires.
Buchet, Paul.—13 rue du Général Dufour. Acetylene lamps.
David et Cie., J. (Moto-rêve motors.)
Delabays, J.—25 bis, rue de Carouge. Bodies.
Dufaux et Cie., H. et A. (La motosacoché.)
Faurax et Cie.—La Jonction. Bodies.
Gangloff fils.—10 bvd. Helvétique. Bodies.
Heininger, Max.—29 Coulouvrenière. Coils.
Humberset, A.—40 bvd. St-Georges. Bodies.
Mégevot et Cie., C. J. Acetylene lamps, oil lamps, radiators.
Montandon-Robert.—2 place de la Fusterie. Speed indicators.
Muffat, Albert.—35 rue du Stand. Pneumatic leather tires.
Picker, Moccand et Cie., Société Anonyme des Anciens Établissements.—78 Chêne-Bougeries. Automobile motors.
Société Suisse de Carrosserie en Automobiles.—26 rue de la Coulouvrenière. Bodies.

SWITZERLAND (Continued)

Taddeoli, E.—25 rue de l'Arquebuse.
Motorcycle motors.

Truchet.—11 rue du Léman. Non-skids.

Publications.

Suisse, La Sportive.—16 rue de Hesse.

LIESTHAL—

Motorcycle Manufacturers.

Velofabrik Liesthal. (Oris motorcycles.)

Parts and Accessories Manufacturers.
Wieress et Cie. Primary batteries.

MANNEDORF—

Parts and Accessories Manufacturers.
Staub und Co. Non-skids.

MENZIEN (ARGOVIA)—

Automobile Manufacturers, Gasolene Commercial.

Weber Landolt. (Trucks.)

MOUTIER (JURA-BERNOIS)—

Motorcycle Manufacturers.

Balmer, U.

NEUFCHATEL—

Parts and Accessories Manufacturers.

Société Anonyme Muller-Vogel et Cie.
—St. Aubin. Automobile motors.

Société Neufchâteloise d'Automobiles
Boudry. Automobile motors.

OERLIKON—

Parts and Accessories Manufacturers.

Schmid-Roost, J. High tension magnetos and ball bearings.

RIEDICKON-USTER—

Motorcycle Manufacturers.

Ruegg frères. (Schwalbe motorcycles.)

SWITZERLAND (Continued)

SOLEURE—

Parts and Accessories Manufacturers.

Sauser, Jacggi und Co. Spark plugs.

ST. BLAISE—

Automobile Manufacturers, Gasolene.

Martini Automobile Co., Ltd. (Martini cars.)

Automobile Manufacturers, Gasolene Commercial.

Martini Automobile Co., Ltd. (Martini cars.)

ZURICH—

Clubs and Associations.

Aero Club Suisse. (Aero Club of Switzerland.) Member F. A. I.

Automobile Manufacturers, Gasolene.

Ajax.—80 Hirschengraben. (Ajax cars.)

Fischerre et Cie., Martin.—Spitzkekre.

Motorwagenfabrik Excelsior Actien Gesellschaft. (Excelsior cars.)

Vulcan Schweiz-Automobil und Motorbootfabrik, Actien Gesellschaft. (Vulcan cars.)

Weidmann und Co.—93 Brunastrasse.

Automobile Manufacturers, Gasolene Commercial.

Arbenz und Co., Eugene.—17 Wolfbach Strasse. (Arbenz cars.)

Parts and Accessories Manufacturers.

Boehny, R. Spark plugs.

Elektrotechnischefabrik, Lutz. —Hornergasse 12. Low tension magnetos.

Geissberger. Bodies.

Magneta Actiengesellschaft. High tension magnetos.

Société Anonyme des Radiateurs Egloff. Radiators.

Weidmann et Cie.—93 Brunnastrasse. Automobile motors.

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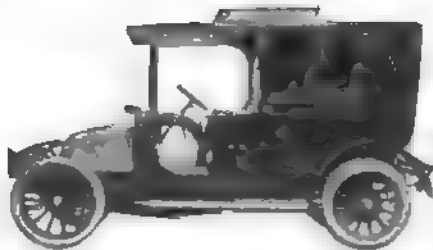
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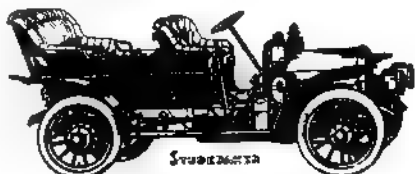
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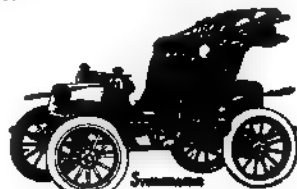
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PORTLAND, ORE.: Studebaker Bros. Co., Northwest 330 and 336 East Morrison Street.
SAN FRANCISCO, CAL.: Studebaker Bros. Co. of California, Market and 16th Streets.
SEATTLE, WASH.: Studebaker Bros. Co. Northwest, 308 First Avenue, So.

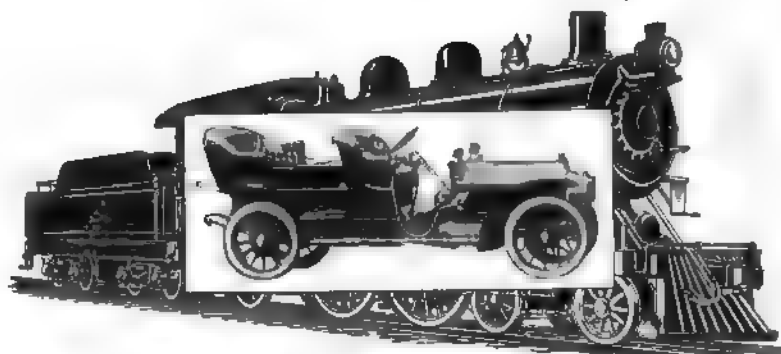


Model H, 30 H. P. 5-Passenger



Electric Victoria Phaeton

AMERICAN LOCOMOTIVE MOTOR CAR



A COMPOSITE OF SUPERIORTIES

Distinctive in Every Respect

IMPORTED MATERIALS

AMERICAN WORKMANSHIP

This Anti-Fatigue Car (thus known because vanadium, the "anti-fatigue metal," is used in its steel and iron) is a French design, developed here for the most perfect conquest of American roads—an ideal plan worked out, with the backing of a \$50,000,000 company, to practicability and commercial success.

"IT STAYS NEW"

AMERICAN LOCOMOTIVE AUTOMOBILE COMPANY

Factory, PROVIDENCE, R. I.

1886 BROADWAY, NEW YORK

Park Square Auto Station, Boston
Bergdoll Motor Car Co., Philadelphia, Pa.

American Locomotive Automobile Agency, Pittsburg
W. W. Shaw Co., Chicago

Fisk Tires (BOLTED ON)

are for those who believe in safety and want a tire that cannot be pulled off accidentally on any curve at any speed, even if punctured.

Fisk Removable Rims

are for those who want the latest practical expression in this line. They fit the bolted-on tires and are marvels of lightness, sureness and facility. Newly improved and fool proof. An ordinary wrench and two minutes suffice to remove the rim and replace with a spare one, carrying the already inflated tire.

Fisk Quick Detachables and Fisk Clinchers

are for those who use these types, but who believe in economy and are willing to pay a trifle more for **FISK QUALITY**.

THE FISK RUBBER COMPANY

Chicopee Falls, Mass.

Eighteen branches in principal cities enable us to take good care of Fisk customers

THE HOL-TAN CAR

THE HOL-TAN Car has been designed and built to our order. It incorporates those features of design which in our experience have proved satisfactory to our high-class clientele. It is built in two types of chassis, one adapted for runabout and light touring bodies, the other for heavy touring and closed types, any of which will be supplied to order.

The HOL-TAN Company's guarantee backs up the performance of every HOL-TAN Car just as has formerly been the case with our FIAT cars.

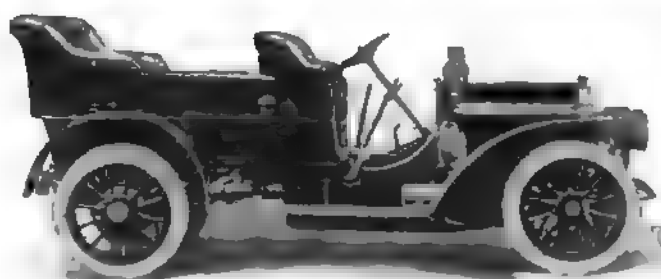
Our large FIAT stock room of duplicate parts will be maintained for our old FIAT purchasers, and the prices of parts have been greatly reduced.

THE HOL-TAN CO.

244-250 West 49th St., New York

(NOTE NEW ADDRESS)

Garford



The Garford automobile is designed to be the "type" of the day.

In every element that enters into the final product, the Garford undertakes to conform to the most approved engineering and constructive practice in the art of automobile building.

Expressed differently, the consensus of opinion of those best qualified to judge is in favor of certain types and standards proved good by general experience, and the Garford strives to conform absolutely to these accepted standards.

ADDRESS

Eastern Inquiries

**GARFORD MOTOR CAR CO.
OF NEW YORK**

1540 Broadway, New York City

Western Inquiries

**GARFORD MOTOR CAR CO.
OF CLEVELAND**

1372 East 12th St., Cleveland



"The Car Without a Fault"

The
MARTINI

(Made in Switzerland)

**RELIABLE
FAST
NOISELESS**

Martini Import Co.

**239 West 50th Street
New York City**

PALMER & SINGER

MFG. CO.

Best in Motor Cars

**Simplex
Selden
Palmer—Singer**

Best Constructions

Best Materials

Best Workmanship

NEW YORK

**1620-24 Broadway
Broadway & 50th St.**

CHICAGO

1321 Michigan Ave.

MOON CARS 1908

Roadster - \$3,000

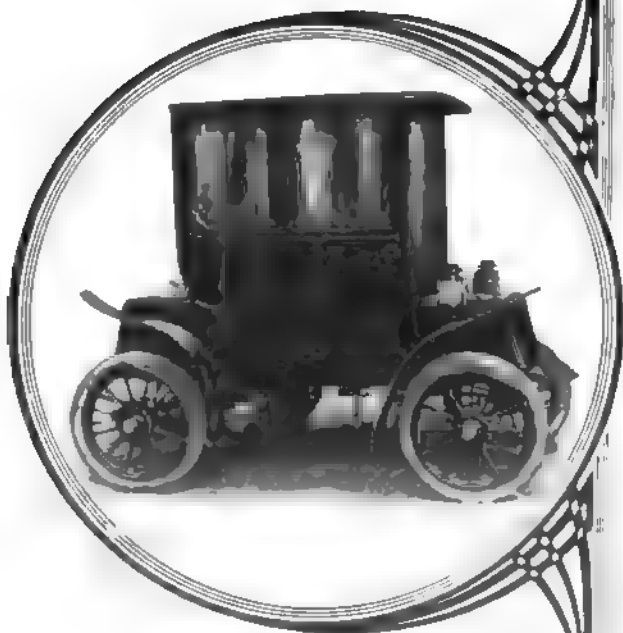
5-Passenger, \$3,000

7-Passenger, \$3,750

Designed by L. P. Mooers, and combining the very best European and American practice, at a moderate cost and can be operated at a low up-keep expense.

MOON MOTOR CAR CO.

ST. LOUIS, MO.



Baker Inside Driven Coupe

is the ideal car for city or suburban use. The body is interchangeable with our Queen Victoria Model, thus giving two cars for practically the price of one, adaptable as an open car for Summer use or as a closed car for Winter and stormy weather.

Baker Electric Vehicles

*gives more speed and greater
mileage without recharging
than any other electric made.*

Handsome in design, elegant in all their appointments, perfect in every detail and absolutely dependable, Baker Electrics have demonstrated their superiority beyond challenge.

Let Us Send You

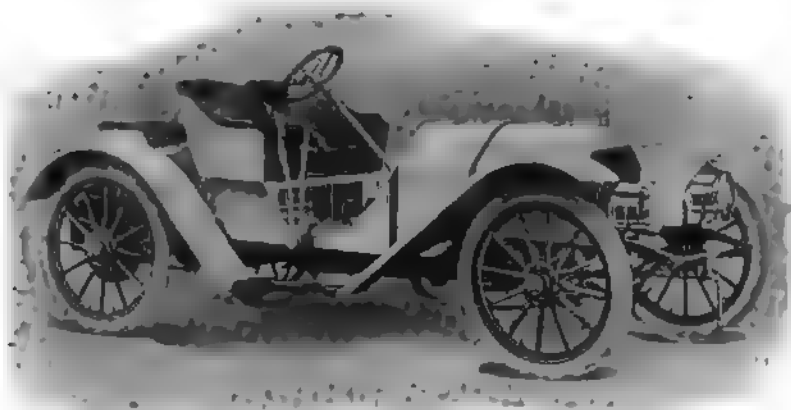
our 1908 catalogue that illustrates and describes the complete line of Baker Electric Coupés, Broughams, Victorias, Landaulets, Surreys, Runabouts, etc.

The Baker Motor Vehicle Company
32 West 80th Street, Cleveland, Ohio.

Agencies in the Principal Cities.

IMPERIAL ROADSTER

The Car With the Straight Line Drive



30-35 H. P., 36-inch wheels, selective type transmission, Esemann Magneto, double drop frame
Price, including gas lamps and generator, horn, tools, etc., \$2,500.00.

MANUFACTURED BY THE
IMPERIAL MOTOR CAR COMPANY, Williamsport, Penna., U. S. A.
Members A. M. C. M. A.

THE BEST

DAILY NEWSPAPER
IN PITTSBURG IS

THE PITTSBURG DISPATCH

It goes to the homes of 95 per
cent. of the automobile owners
in the Pittsburg territory.

GET THE BEST ALWAYS

Western Advertising Office :

**BOYCE BUILDING
PITTSBURG**

HORACE M. FORD, Manager

Eastern Advertising Office :

**BRUNSWICK BUILDING
NEW YORK**

WALLACE G. BROOKE, Manager

MOTOR

¶ You will find MOTOR to be the motoring publication you want. If you are interested in motor cars, either as prospective buyer or an owner of a motor-car—no matter what you want to know about motor-cars, their parts or accessories, MOTOR is the most reliable source of information.

¶ MOTOR's editorial pages contain everything of interest to the motorist—descriptions of cars, parts, accessories, etc., touring articles, useful information, all well printed and fully illustrated.

¶ MOTOR's advertising pages—just as important to the reader, particularly the prospective buyer, as the text pages—contain the announcements of all the standard manufacturers of cars, parts, accessories etc., in the world.

¶ In order to introduce MOTOR to you we make you

THIS SPECIAL OFFER

For \$1 (regular price \$3 a year) we will send you MOTOR for 6 months as a trial subscription

MOTOR

Dept. I. M. C.

2 DUANE STREET, NEW YORK CITY

Automobile Topics

Illustrated

THE USERS' PAPER

covers fully the sport and pastime of motoring all over the world. Its reports of contests and competitions are written by correspondents familiar with the conditions and competent to tell their story intelligently and graphically, and are fully illustrated. Special attention is given to touring, and every week a supplement is published giving a Touring Route with map and road directions.

International Motor Cyclopaedia

changes, additions and corrections will be published each week in *Automobile Topics*, properly arranged and classified.

*Published Every Saturday
in the Year*

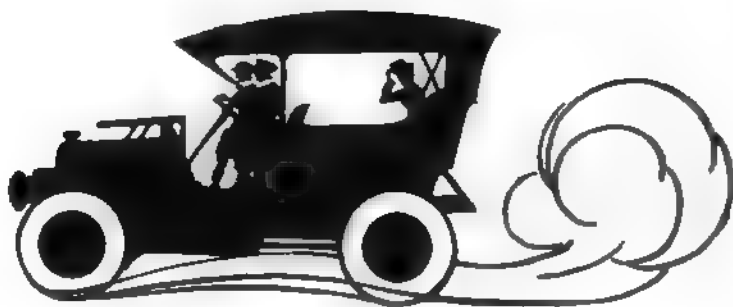
*\$2.00 per Year
10 cents per Copy*

AUTOMOBILE TOPICS

402 Times Building

(After May 1, Terminal Building, Park Avenue and 41st Street)

NEW YORK



RHYME AND REASON

That out of door man, who cuts many a melon,
Spends "mun" moting motors, its useless to dwell on.
You make THE machine and let him make the money,
Like God makes the flowers, while bees make the honey.
This man's in the market a bubble to buy,
You may sell him your make of car, if you try.

OUTING is a magazine as broad as all outdoors.
It is first of all the magazine of lovers of
outdoor life, who have the means and the
taste to enjoy the sports that go with outdoor life.
They have also the ordinary wants, and the means
to buy your goods.

If you only make something good enough,
OUTING is the best advertising medium in the world
for you. You do not have to argue with OUTING's
readers to prove that quality is a desirable thing, no
matter what the price. You merely have to prove
to them that you have the quality. They will not
even ask the price.

New York—The Outing Magazine—Chicago

ALLAN C. HOFFMAN, Advt. Mgr.

Collier's has ideas, and dares to express them;
It is hampered by no cut-and-dried policy;
It speaks for no party, no class, no section;
It is controlled only by what it believes to be
the truth.

Collier's keeps step with the march of the
times;

Yet timeliness never plays havoc with its
discrimination,

And its enterprise is tempered always with
judgment.

Stories, verse, drawings, paintings, news-
bringing photographs, and clever sketches make
Collier's attractive from cover to cover.

Whatever is interesting, is timely, is really
worth while—may always be found in **Collier's**.

That is why over half a million American
homes subscribe for **Collier's**.

Discerning advertisers naturally find it
advantageous to have their announcements
heralded in **Collier's**.

COLLIER'S, THE NATIONAL WEEKLY

E. C. Patterson, Advertising Manager

416 West 13th Street 1039-42 Marquette Building
NEW YORK CHICAGO

Motor Field

Incorporating
"CYCLING WEST"
and "THE WESTERN AUTO"

1742-1748 STOUT STREET
DENVER, COLO.

IT circulates all over the United States, but more especially in the twenty-four States west of Chicago, where it reaches all the automobile, motorcycle, and bicycle owners, jobbers, dealers, and repairmen.

**IT COVERS THE WEST
AND THE PACIFIC COAST.**

Subscription \$1.00 per year

ISSUED MONTHLY

**Every day is a motoring day and
thus a salesday in our territory**

LET US ACT AS YOUR GENERAL WESTERN REPRESENTATIVES FOR BUSINESS AND PUBLICITY

G. A. WAHLGREEN
Publisher and Editor

J. L. GARTLAND
Associate Editor

**1742-1748 STOUT STREET
DENVER, COLORADO**

TWO LETTERS AND A CLAIM REGARDING Motor Age

The Most Interesting of all Automobile Publications to its Subscribers, and the Greatest of Result Bringers among its Advertisers.

The letters represent a composite reproduction of the many received

From Our Subscribers

"Motor Age is the brightest and most readable of all the publications devoted to automobiling. Its profuse illustrations, its touring stories, and "Clearing House" department make it invaluable to motor-car owners. Its technical section is also all that any reader might desire, although it does not tire its readers by giving them only this engineering matter to the exclusion of lighter and more breezy topics. Motor Age is an ideal publication for all motorists."

The above letter is a composite reproduction of the sentiments contained in the thousands received by us from our appreciative subscribers.

From Our Advertisers

"As an advertising medium, Motor Age has done more for us than any other publication in the field. Our investment in its advertising pages has been productive of exceedingly good results. Every mail brings letters from various sections of the country stating our adv. was seen in Motor Age. It is a perfect medium for reaching automobile owners as well as the makers, dealers and garages. We will renew our advertising contract when same now running expires."

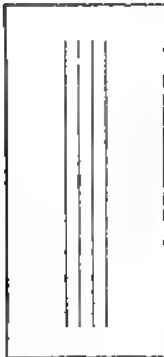
Hundreds of letters received by us from as many of our advertisers would, if boiled into one, contain the expressions embodied above.

The subscription price to **Motor Age** is **\$3.00 per year**—\$3 for 52 weekly issues of America's brightest and best automobile publication. Sample copy on request. Advertising rates on application. Write us for the most liberal "try out" advertising proposition you ever heard of.

MOTOR AGE, 1200 Michigan Ave., Chicago

THE HOLLENDEN

CLEVELAND, OHIO



Cleveland's
Leading
Hotel



JAMES H.
THOMPSON
Manager

SUPPLIES

APPAREL

EVERYTHING PERTAINING TO AUTOMOBILES
The Auto Supply Co.
EST. 1899 JOHN LURIE, Prop.
1733 to 1737 BROADWAY, N.Y. NEAR 55TH ST.

In every detail the most complete establishment of its kind in the world.

TOOLS

HARDWARE

The Chicago Inter Ocean

FIRST

IN AUTOMOBILE ADVERTISING

DURING THE PAST TWO YEARS

IN the year 1907, as in the year 1906, The Inter Ocean greatly excelled all other Chicago newspapers in the amount of automobile advertising carried. This is the more striking since the Inter Ocean radically increased its rates on this class of advertising last spring.

ACHIEVEMENTS IN 1907.

The principal achievements of the year were:

During the Automobile Show last February The Inter Ocean printed as much display automobile advertising as its two principal competitors in the morning field combined.

In the first six months of the year The Inter Ocean printed 133 columns more advertising than its nearest competitor in the morning field.

During the Automobile Show in December The Inter Ocean printed nearly twice as much display automobile advertising as its nearest competitor in the morning field.

In the last six months of 1907 The Inter Ocean printed 111 columns more display automobile advertising as its nearest competitor and more than the Record-Herald and Examiner combined.

For the full year of 1907 The Inter Ocean printed 723 1-3 columns of automobile advertising. This is 269 columns more than was carried by its next competitor in the morning field and over 125 columns more than the leader in the evening field.

THE RECORD IN FIGURES

Following are the figures of the morning newspapers, in columns, together with a comparison with the previous year:

	1907	1906	Increase
INTER-OCEAN	723 1-3	453 1-3	270
Record-Herald	454 4-5	320 1-2	134 1-5
Tribune	422 2-5	151 1-2	271
Examiner	302 4-5	*	

*Figures not available.

THE REASON WHY.

The reason The Inter Ocean carries more automobile advertising than any other Chicago newspaper is because it brings better results to automobile advertisers.

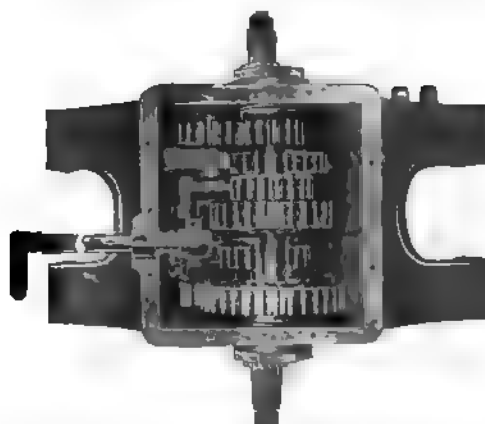
Automobiles are high class merchandise and are purchased only by people with money. The Inter Ocean's circulation is high class circulation and appeals to people with money.

THE INTER OCEAN has more readers who can afford to buy automobiles than any other Chicago newspaper.

THE INTER OCEAN is the recognized medium in the Middle West for Automobile Advertising.

BROWN-LIPE GEARS

**SELECTIVE AND PROGRESSIVE
SLIDING GEAR TRANSMISSIONS**



DIFFERENTIALS AND STEERING GEARS

Direct Factory Salesmen:—K. FRANKLIN PETERSON, 166 Lake St., Chicago. THOMAS J. WETZEL, 29 West 42nd St., New York City.
Sales Agent, Carrying Stock:—CHAS. E. MILLER, 97 Reade St., New York; 318-320 N. Broad St., Philadelphia; 202-4 Columbus Ave., Boston. 406 Erie St., Cleveland, Ohio.
Eastern Sales Agents: POST & LESTER CO., Hartford, Conn.

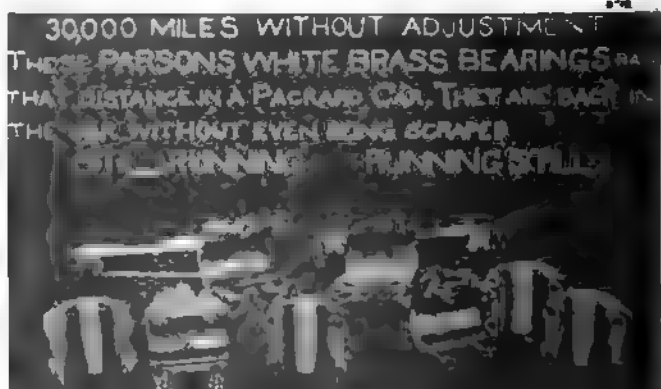
BROWN-LIPE GEAR CO., 200 S. Geddes St., Syracuse, N. Y.

Cramp Metals for Automobile Work



**PARSONS' MANGANESE BRONZE
REAR AXLE CASES FOR CORBIN
MOTOR VEHICLE CORPORATION**

The
Wm. Cramp & Sons
Ship and Engine
Building Co.
Philadelphia, Pa.



THE STANDARD

Electric Welding
Motor Vehicle Rims
Tubing

WELDING CO.
CLEVELAND

GRAY & DAVIS
LAMPS

Standard of the World

GRAY & DAVIS
AMESBURY, MASS.

"KEEP YOUR EYE ON CONTINENTALS"

Continental TIRES

The Continental Caoutchouc Company is one of the oldest and largest rubber manufacturing establishments in the world. It produces every year more automobile tires than any other concern.

It has agencies in all countries. The Continental is really an international tire. The equipment can be replaced readily in any part of the world—a great consideration for tourists.

Continental Tires are noted for durability. They are correctly termed "the low-cost-per-mile" tires. Made in all styles and sizes. American and Metric, flat tread, round tread, Rouge-Ferré and Ready-Flated.

Rouge-Ferré (anti-skid) is a type of

tire with steel studs embedded in the tread during the process of manufacture, in such a way that they cannot work loose or be torn out, but will permanently prevent skidding.

Ready-Flated Tires are for use with our Demountable Rim. They are carried already inflated, and, in case of puncture or accident, tires can be changed immediately, in less time than the inflating alone would require by the ordinary method.

On account of its leading position in the tire trade, the Continental Company aims to introduce new features as soon as satisfied that they are right. At the same time, tires of all the standard types are provided of the highest quality.



TRADE MARK

CONTINENTAL CAOUTCHOUC CO., NEW YORK

J. M. GILBERT, General Manager.

Branches and Distributing Agencies in All Principal Cities.



Better Tire Service

MEANS—THE USE OF

Firestone

Pneumatic Tires for Pleasure Cars
Solid Tires for Commercial Vehicles

THE WORLD'S STANDARD

FIRESTONE TIRE AND RUBBER CO.

The Largest Exclusive Rubber Tire Makers in the World

Factory and General Offices, AKRON, OHIO

BRANCHES:

New York, Boston, Philadelphia, Chicago,
St. Louis, Detroit, Buffalo, Pittsburg



AJAX

WRAPPED TREAD

TIRES

Guaranteed for 5,000 Miles Riding

What stronger proof could there be of Ajax
Material and Workmanship?

Write for copy of guarantee, stating what size tire you
are using. Address Dept. 1.

Ajax-Grieb Rubber Co.,

General Offices: N. E. Cor. 57th St. & Broadway,
New York City

Factories: Trenton, N. J.

BRANCHES:

New York 177th Broadway,
Boston 819-A Boylston Street
Chicago 1418 Michigan Avenue
Detroit 741 Woodward Avenue
Denver 1529 Cleveland Place
San Francisco 460 Golden Gate Ave
Seattle 102 Broadway
Los Angeles 1040 S. Main St.
Agents in all large cities.



The

Hartford Rubber Works Co.

Hartford, Conn.

MANUFACTURERS OF

QUALITY TIRES

BRANCHES:

NEW YORK.....57th St. and Broadway	DENVER.....1564 Broadway
CHICAGO.....83 Michigan Ave.	PHILADELPHIA.....1425 Vine St
BOSTON.....817 Boylston St.	CLEVELAND.....1831 Euclid Ave
DETROIT.....256 Jefferson Ave.	ATLANTA, GA.....55 Auburn Ave.
BUFFALO.....725 Main St.	

Agencies: Gugler Electric Mfg. Co., Minneapolis; The St. Louis Tire Agency,
3685 Olive St., St. Louis, Mo.; Mercantile Lumber & Supply Co.,
Kansas City; Chanslor & Lyon Motor Supply Co., 930 S. Main St., Los Angeles, Calif.;
542 Golden Gate Ave., San Francisco, Calif.; F. P. Keenan Co., Portland (Ore.); Salt
Lake Hardware Co., Salt Lake City; Compania Mexicana de Vehiculos Electricos, City
of Mexico.

—FREE—
TOURING MAPS

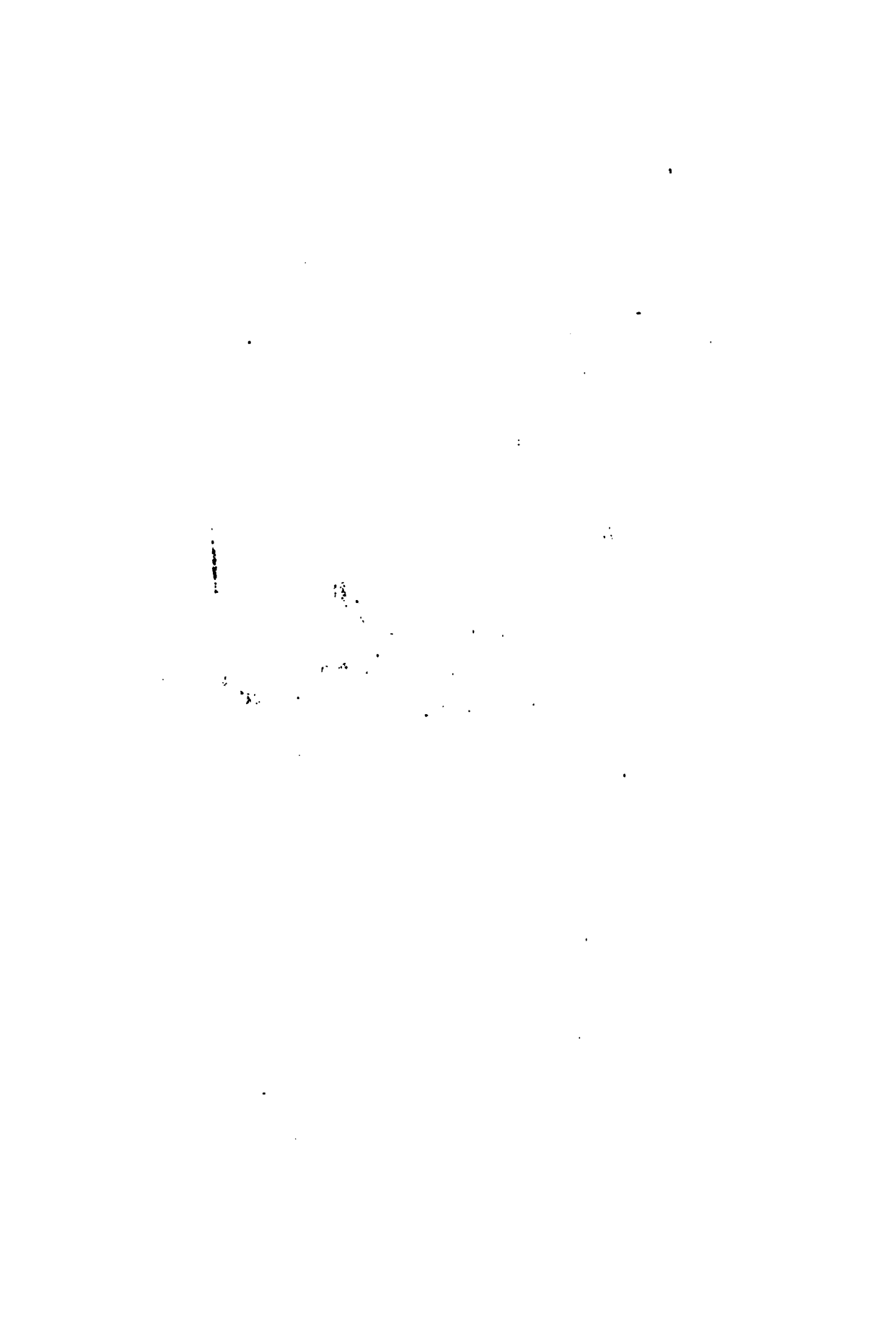
in every issue of
AUTOMOBILE TOPICS
(WEEKLY)

Printed on heavy
manila paper,
with detailed road
directions

TIMES BUILDING : : NEW YORK

(From May 1, Terminal Building, Park Ave. and 41st St.)

13
3
10



This book should be returned to
the Library on or before the last date
stamped below.

A fine of five cents a day is incurred
by retaining it beyond the specified
time.

Please return promptly.

FOR USE IN
BUILDING

~~DUE JAN 22 1941~~
~~DUE MAY 29~~

~~DUE JAN 22 1941~~

~~DUE OCT - 5 1948~~

~~DUE APR - 8 1949~~

